FEMP FIRST THURSDAY SEMIN@RS 2.0

What you need to know... live, online, and anytime.

Learner's Guide

Federal Fleet Management 101

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Background on the **FEMP First Thursday Seminars**

FEMP's **First Thursday Seminars** are designed for Federal Energy Managers but are open to anyone whose scope of responsibility involves influencing decisions to increase energy efficiency, conserve water resources, and meet other Federal sustainability goals. In the case of the Federal Fleet Management seminar, the primary audience for the training is Location Fleet Managers but other energy and environmental professionals in the Federal and Federal contractor arena may find this training useful.

There are three ways to participate in the seminars.

1. Live streaming video available on the day of the event over the internet to a desktop computer or via a projection system in a conference room;
2. Digital and Analog Satellite downlink technology for group showings; and,
3. Archived streaming video available after the event over the internet on a desktop computer or via a projection system in a conference room.

To learn more about accessing specific seminars, access http://www.femp.energy.gov/firstthursday.

Introduction to the Seminar "Federal Fleet Management 101"

The seminar "Federal Fleet Management 101" is being offered live on Thursday, February 3, 2011 at 1:30 p.m. Eastern Time. For access and other course information, access: the seminar's landing page here.

The seminar is designed to give you up-to-date information to meet E.O. 13514 and other Federal fleet requirements through best practices that reduce greenhouse gas emissions and petroleum consumption while increasing alternative fuel use and fleet fuel efficiency.

The seminar will last 90 minutes.

Learner Objectives

After completing this seminar, the learner will:

1. Explain the 3 driving principles of petroleum reduction.
2. Explain the responsibilities of the Headquarters Fleet Manager and the Fleet Location Manager for the Implementation of E.O. 13514.
3. Explain the purpose of a Vehicle Allocation Methodology (VAM).
4. List 5 strategies for reducing vehicle miles travelled.
5. List 5 strategies for increasing fuel economy.
6. List 3 strategies related to use of alternative fuels and biodiesel blends.
7. List 3 strategies for Electric Vehicle Acquisition.
8. Discuss annual reporting requirements related to Federal Fleet.
9. Name 3 Federal Fleet resources available through FEMP.

Asking Questions

At the end of each seminar, there will be an opportunity for you to ask questions. You will be able to email, fax, or ask questions by phone. You may email or fax your questions anytime during the broadcast. You will be able to speak "live" with the instructor at the end of the presentation. The phone, fax, and email information will be posted on the screen during the seminar.

During the live broadcast, ask questions by either:

- Dialing the toll free number 800-775-3728
- Faxing questions to 865-381-0554
- Or by sending an email to FTS@energyworkshops.org.

Upon Seminar Completion

Each participant who registers for the training via FEMP Central or who signs a Roster (at a satellite broadcast location) will be sent an email with a link to the seminar evaluation and the open book quiz. If you do not have a Roster, they are available here. Please sign the Roster and scan/ email to ruleb@tds.net or Fax to 865-381-0554. Upon completion of the evaluation and the open book quiz, you will be able to print a course completion certificate for your records.

Additional Materials

The materials in this section support the learning in the presentation. Slide numbers from the presentation are referenced here.

Resources for Your Use

U.S. Department of Energy (DOE) Federal Energy Management Program (FEMP) resources below can be found online at FEMP's Fleet Management Web site: http://www1.eere.energy.gov/femp/program/fedfleet_resources.html.

Federal Fleet Management Guidance Document

Course Participants should read the Executive Summary and Chapter 1 of the Guidance for Federal Agencies on E.O. 13514 Section 12, Federal Fleet Management. http://www1.eere.energy.gov/femp/pdfs/fleetguidance_13514.pdf.

This *Guidance for Federal Agencies on E.O. 13514 Section 12, Federal Fleet Management* fulfils the Executive Order (E.O.) 13514 Section 12 requirement for the U.S. Department of Energy (DOE) to issue comprehensive Federal fleet management guidance. It has been written to help agencies develop an overall fleet greenhouse gas (GHG) emission and petroleum reduction strategy and executable plan for their vehicle fleets. Three key petroleum reduction strategies—reducing vehicle miles travelled (VMT), increasing fleet fuel efficiency and optimization measures, and displacing petroleum with alternative fuel use— are discussed in further chapters of this document.

Federal Fleet Management Handbook

Course Participants should read the Executive Summary and Chapter 1 of the *Comprehensive Federal Fleet Management Handbook*. http://www1.eere.energy.gov/femp/pdfs/eo13514_fleethandbook.pdf.

Depending on individual responsibilities and needs, participants may want to review additional chapters of the Handbook as well.

The *Comprehensive Federal Fleet Management Handbook* builds upon the "Guidance for Federal Agencies on E.O. 13514 Section 12 – Federal Fleet Management"1 by providing additional detail to help fleet managers implement the Guidance. It supplements the Guidance to help Federal agencies select optimal greenhouse gas (GHG) and petroleum reduction strategies for each fleet location, meeting or exceeding related fleet requirements, acquiring vehicles to support these strategies while minimizing fleet size and vehicle miles travelled (VMT), and refining strategies based on agency performance. The Handbook serves as one component of the U.S. Department of Energy's (DOE) Executive Order (E.O.) 13514 Section 12 fleet management toolkit, which also includes the Guidance and supporting resources, including the Federal fleet optimization tool.

The following Federal government websites provide a wide range of information and resources to assist Federal fleets in meeting their GHG emission reduction, petroleum reduction, alternative fuel use, and AFV acquisition mandates:

- GSA offers a wide range of services for fleet managers including vehicle purchasing and full service fleet leasing. The GSA Web site contains information on alternative fuel vehicles, safe driving practices, vehicle rates, and fleet services cards. In addition, through *GSA Fleet Drive Thru*, customers are able to obtain information on their leased vehicles such as: current inventory, fuel use, FAST data, and crash data. For more information from GSA on AFVs and other fleet issues please see http://www.gsa.gov/afv.

- The Alternative Fuels Data Center (AFDC) provides a wide range of information and resources to enable the use of alternative fuels, in addition to other petroleum reduction options such as advanced vehicles, fuel blends, idle reduction, and fuel economy. Visit: http://www.afdc.energy.gov/afdc/.

- Clean Cities has a network of almost 90 volunteer coalitions, which develop public/private partnerships to promote alternative fuels and advanced vehicles, fuel blends, fuel economy, hybrid vehicles, and idle reduction. Clean Cites coordinators in metropolitan areas throughout the country can help fleets partner with fuel providers and other public and private fleets to develop alternative fuel infrastructure. Visit: http://www1.eere.energy.gov/cleancities/.

Glossary of Terms

Additives - Chemicals added to fuel in very small quantities to improve and maintain fuel quality. Detergents and corrosion inhibitors are examples of gasoline additives.

Advanced Technology Vehicle (ATV) - A vehicle that combines new engine/power/drive-train systems to significantly improve fuel economy. This includes hybrid power systems and fuel cells, as well as some specialized electric vehicles.

Aftermarket - Broad term that applies to any change after the original purchase, such as adding equipment. When applied to AFVs, it refers to conversion devices or kits for conventional fuel vehicles.

Alcohol - Organic compounds that are distinguished from hydrocarbons by the inclusion of a hydroxyl group. The two simplest alcohols are methanol and ethanol.

Aldehydes - A class of organic compounds derived by removing the hydrogen atoms from an alcohol. Aldehydes can be produced from the oxidation of an alcohol.

Alternative Fuel Data Center (AVDC) - The Alternative Fuels and Advanced Vehicles Data Center provides a wide range of information and resources to enable the use of alternative fuels (as defined by the Energy Policy Act of 1992), in addition to other petroleum reduction options such as advanced vehicles, fuel blends, idle reduction, and fuel economy.

Alternative Fuel - Methanol, denatured ethanol, and other alcohols; mixtures containing 85% or more by volume of methanol, denatured ethanol, and other alcohols with gasoline or other fuels; natural gas; liquefied petroleum gas; hydrogen; coal-derived liquid fuels; non-alcohol fuels (such as biodiesel) derived from biological material; and electricity. 'P-Series' fuels were added to this list since the original definition in EPAct.

Alternative Fuel Provider - A fuel provider (or any affiliate or business unit under its control) is an alternative fuel provider if its principal business is producing, storing, refining, processing, transporting, distributing, importing, or selling (at wholesale or retail) any alternative fuel (other than electricity); or generating, transmitting, importing, or selling (at wholesale and retail) electricity; or if that fuel provider produces, imports, or produces and imports (in combination), an average of 50,000 barrels per day of petroleum and 30% (a substantial portion) or more of its gross annual revenues are derived from producing alternative fuels.

Alternative Fuel Vehicle (AFV) - As defined by the Energy Policy Act, any dedicated, flexible-fuel, or dual-fuel vehicle designed to operate on at least one alternative fuel.

Alternative Fuels Data Center (AFDC) - A program sponsored by DOE and managed by the National Renewable Energy Laboratory to collect data and information on all types of Alternative Fuels and AFVs across the country.

Alternative Fuels Utilization Program (AFUP) - A program managed by DOE with the goals of improving national energy security by displacing imported oil, improving air quality by development and widespread use of alternative fuels for transportation, and increasing the production of AFVs.

Alternative Motor Fuels Act of 1988 (AMFA) - Public Law 100-494. Encourages the development, production and demonstration of alternative motor fuels and AFVs.

American Society for Testing and Materials (ASTM) - A nonprofit organization that provides a management system to develop published technical information. ASTM standards, test methods, specifications, and procedures are recognized as definitive guidelines for motor fuel quality as well as a broad range of other products and procedures.

Anhydrous - Describes a compound that does not contain any water. Ethanol produced for fuel use is often referred to as anhydrous ethanol, as it has had almost all water removed.

Aromatics - Hydrocarbons based on the ringed six-carbon benzene series or related organic groups. Benzene, toluene and xylene are the principal aromatics, commonly referred to as the BTX group. They represent one of the heaviest fractions in gasoline.

B100 - 100% (neat) biodiesel.

B20 - A blend of biodiesel fuel with petroleum-based diesel where 20% of the volume is biodiesel.

Benzene - A six-carbon aromatic; common gasoline component identified as being toxic. Benzene is a known carcinogen.

Bi-Fuel Vehicle - A vehicle with two separate fuel systems designed to run on either an alternative fuel, or gasoline or diesel, using only one fuel at a time. Bi-fuel vehicles are referred to as "dual-fuel" vehicles in the Clean Air Act Amendments and Energy Policy Act.

Biodiesel - A biodegradable transportation fuel for use in diesel engines that is produced through transesterification of organically derived oils or fats. Biodiesel is used as a component of diesel fuel. In the future it may be used as a replacement for diesel. Biodiesel is an alternative fuel derived from plant oils. Biodiesel is both renewable and biodegradable.

Biomass - Renewable organic matter such as agricultural crops; crop waste residues; wood, animal, and municipal waste, aquatic plants; fungal growth; etc., used for the production of energy.

BTX - Industry term referring to the group of aromatic hydrocarbons—benzene, toluene and xylene (see aromatics).

CAFE Standards - The Corporate Average Fuel Economy (CAFE) standards are U.S. regulations enacted in 1975 to help increase overall fuel efficiency. By these standards, every auto maker is required to determine the average mileage of each vehicle it builds.

Carbon Dioxide (CO2) - A product of combustion that has become an environmental concern in recent years. CO2 does not directly impair human health, but is a greenhouse gas that traps the Earth's heat and contributes to the potential for global warming.

Carbon Monoxide (CO) - A colorless, odorless gas produced by the incomplete combustion of fuels with a limited oxygen supply, as in automobile engines. According to the U.S. Environmental Protection Agency, CO contributes to the formation of smog ground-level ozone, which can trigger serious respiratory problems.

Carbon Sequestration - The absorption and storage of CO2 from the atmosphere by the roots and leaves of plants; the carbon builds up as organic matter in the soil.

Certification of Higher Learning in Alternative Motorfuels Program (CHAMP) - A national program established by DOE to implement Section 411 of the Energy Policy Act of 1992.

Cetane - Ignition performance rating of diesel fuel. Diesel equivalent to gasoline octane.

Clean Air Act (CAA) - Signed into law in 1963, then amended in 1970, and again in 1990 (see Clean Air Act Amendments of 1990). Includes emissions standard for mobile and stationary sources. Enforced by the U.S. Environmental Protection Agency.

Clean Air Act Amendments of 1990 (CAAA) - Amendments to the Clean Air Act of 1970. The Clean Air Act Amendments of 1990 created two new gasoline standards designed to reduce harmful fuel emissions for vehicles in highly polluted cities. The Act required gasoline to contain cleaner burning additives called fuel oxygenates such as ethanol. This Act recognized that changes in motor fuels and fuel composition would play a vital role in reducing pollution from motor vehicle exhaust.

Clean Cities Program - A voluntary program established and administered by DOE to increase AFV market penetration, particularly in more polluted urban areas. DOE recognizes clean Cities chapters as having successfully established a self-sustaining environment for AFVs. Specific chapters may include Federal, state, and local government agencies, vehicle manufacturers and suppliers, fleet managers, utilities, local distribution companies, and other stakeholders. The first international entities joined the program in 1995.

Clean Diesel - An evolving definition of diesel fuel with lower emission specifications, which strictly limit sulphur content to 0.05 weight %; in California, aromatics content is further limited to 10 volume % (for large refiners).

Clean Fuel - Any fuel or power source that is used to certify a vehicle to the LEV, ILEV, ULEV, SULEV, or ZEV standard.

Clean Fuel Fleet Program – This program was implemented by the U.S. Environmental Protection Agency as a provision of the Clean Air Act Amendments of 1990 to require cities with significant air quality problems to incorporate vehicles that will meet clean fuel emissions standards.

Clean Fuel Vehicle (CFV) - Any vehicle certified by EPA as meeting certain Federal emissions standards. The three categories of Federal CFV standards from least to most stringent are low emission vehicles (LEVs), ultra-low emission vehicles (ULEVs), and zero emission vehicles (ZEVs). The inherently low emission vehicle (ILEV) standard is voluntary and does not need to be adopted by states as part of the Clean-Fuel Fleet Program.

Closed-Loop Carburetion - System in which the fuel/air ratio in the engine is carefully controlled to optimize emissions performance. A closed-loop system uses a fuel metering correction signal to optimize fuel metering.

Compressed Natural Gas (CNG) - Natural gas that has been compressed under high pressures, typically 2000 to 3600 psi, held in a container. The gas expands when used as a fuel. An environmentally cleaner alternative to gasoline and diesel, CNG is made by compressing natural gas to less than 1% of its volume. In doing so, this process reduces carbon dioxide emissions by 20%.

Compression Ignition - The form of ignition that initiates combustion in a diesel engine. The rapid compression of air within the cylinders generates the heat required to ignite the fuel as it is injected.

Congestion Mitigation and Air Quality Improvement (CMAQ) Program - A Federal grant program established by the Intermodal Surface Transportation Act of 1991 that allocates funds to states to help them simultaneously expand or initiate transportation services while improving air quality. CMAQ funds may be used to support alternative fuel and alternative fuel vehicle programs.

Converted or Conversion Vehicle - A vehicle originally designed to operate on gasoline or diesel that has been modified or altered to run on an alternative fuel.

Corporate Average Fuel Economy (CAFE) - Law passed in 1975 that set Federal fuel economy standards (P.L. 94-163). The CAFE values are an average of city and highway fuel economy test results weighted by a manufacturer for either its car or truck fleet. CAFE is also a program created to determine whether vehicle manufacturers are complying with the gas mileage, or fuel economy, standards set by the Federal government. The CAFE values are obtained by combining the city and highway fuel economy test results and computing an average that is weighted by vehicle sales.

Co-solvents - Heavier molecular weight alcohols used with methanol to improve water tolerance and reduce other negative characteristics of gasoline/alcohol blends. Tertiary butyl alcohol (TBA) was used commercially as a co-solvent for methanol/gasoline blends during the 1980s.

Dedicated Natural Gas Vehicle - A vehicle that operates only on natural gas. Such a vehicle is incapable of running on any other fuel.

Dedicated Vehicle - A vehicle that operates solely on one fuel. Generally, dedicated vehicles have superior emissions and performance results because their design has been optimized for operation on a single fuel.

Detergent - Additives used to inhibit deposit formation in the fuel and intake systems in automobiles.

Dimethyl Ether (DME) - An oxygenated hydrocarbon, which is the simplest compound in the class of ethers. It is generally produced from natural gas but almost any carbon-based feedstock can be used, including crude oil, coal, crop residues, oil sands, wood, or straw.

Distillation Curve - The percentages of gasoline that evaporate at various temperatures. The distillation curve is an important indicator for fuel standards such as volatility (vaporization).

Domestic Fuel - As defined by the Energy Policy Act, Section 301, domestic fuel is derived from resources within the United States, its possessions and commonwealths, and Canada and Mexico (the two nations in a free-trade agreement with the United States).

Dual-Fuel Vehicle (EPAct definition) - Vehicle designed to operate on a combination of an alternative fuel and a conventional fuel. This includes vehicles using a mixture of gasoline or diesel and an alternative fuel in one fuel tank, commonly called flexible-fueled vehicles; and vehicles capable of operating either on an alternative fuel (usually compressed natural gas or propane), a conventional fuel, or both, simultaneously using two fuel systems. These are commonly called bi-fuel vehicles.

E10 (Gasohol) - Ethanol mixture that contains 10% ethanol, 90% unleaded gasoline.

E85 - E85 is an alternative fuel blend of 85 percent ethanol and 15 percent gasoline requiring less demand on natural resources than traditional fossil fuels.

E93 - Ethanol mixture that contains 93% ethanol, 5% methanol and 2% kerosene, by volume.

E95 - Ethanol/gasoline mixture that contains 95% denatured ethanol and 5% gasoline, by volume.

Electric Vehicle - A vehicle powered by electricity, generally provided by batteries. EVs qualify in the zero emission vehicle (ZEV) category for emissions.

Electric Vehicles (EVs) - Electric vehicles use energy stored in a battery pack in combination with an electric motor. EVs require no fuel and release no exhaust fumes or emissions into the environment. The battery pack must be recharged from an electric power source.

Electricity - Electricity is considered a fuel when used in electric vehicles. Electricity as a fuel shifts the burden of pollution control to the electrical supply systems, resulting in much lower emissions per mile travelled.

Emission Standards - Limits or ranges established for pollution levels emitted by vehicles as well as stationary sources. The first standards were established under the 1963 Clean Air Act. Emission limits are imposed on four classes of vehicles: automobiles, light-duty trucks, heavy-duty gasoline trucks, and heavy-duty diesel trucks.

Energy Policy Act of 1992 (EPAct) - Passed by Congress to enhance U.S. energy security by reducing our dependence on imported oil. It mandates the use of alternative fuel vehicles, beginning with Federal, then state, then fuel provider fleets.

Energy/Fuel Diversity - A policy that encourages the development of energy technologies to diversify energy supply sources, thus reducing reliance on conventional (petroleum) fuels; Energy/fuel diversity applies to all energy sectors.

Energy/Fuel Security - A policy that considers the risk of dependence on fuel sources located in remote and unstable regions of the world. It also considers the benefits of domestic and diverse fuel sources.

Ethane (C2H6) - A colorless hydrocarbon gas of slight odor having a gross heating value of 1,773 Btu per cubic foot. It is a normal constituent of natural gas.

Ethanol (also known as Ethyl Alcohol, Grain Alcohol, CH 3 CH 2 OH) - Can be produced chemically from ethylene or biologically from the fermentation of various sugars from carbohydrates found in agricultural crops and cellulosic residues from crops or wood. Used in the United States as a gasoline octane enhancer and oxygenate, it increases octane 2.5 to 3.0 numbers at 10% concentration. Ethanol also can be used in higher concentration in alternative fuel vehicles optimized for its use.

Ethyl Ester - A fatty ester formed when organically derived oils are combined with ethanol in the presence of a catalyst. After water washing, vacuum drying, and filtration, the resulting ethyl ester has characteristics similar to petroleum-based diesel motor fuels.

Ethyl Tertiary Butyl Ether (ETBE) - A fuel oxygenate used as a gasoline additive to increase octane and reduce engine knock.

Evaporative Emissions - Hydrocarbon vapors that escape from a fuel storage tank or a vehicle fuel tank or vehicle fuel system.

Excluded Vehicles and Equipment - Any vehicle, vessel, aircraft, or non-road equipment owned or operated by an agency of the Federal Government that is used in combat service or support, tactical or relief operations or training, Federal law enforcement, emergency response, or space flight vehicles.

Federal Automotive Statistical Tool (FAST) - Facilitates the annual reporting to Congress related to compliance with Federal fleet annual reporting deadlines.

Feedstock - Any material converted to another form of fuel or energy product. For example, cornstarch can be used as a feedstock for ethanol production.

Fermentation - The enzymatic transformation by microorganisms of organic compounds such as sugar. It is usually accompanied by the evolution of gas as the fermentation of glucose into ethanol and CO2.

Flex-fuel Vehicle (FFV) - Flex-fuel vehicles accept, and are powered by, regular gasoline or an ethanol blend, such as E85 -- a fuel blend consisting of 85 percent ethanol and 15 percent gasoline requiring less demand on natural resources than traditional fossil fuels.

Fossil Fuels - Fossil fuels (such as oil and natural gas) are formed by the natural resources of buried dead organisms that lived millions of years ago. They produce a significant amount of energy yet they emit greenhouse gases, which contribute largely to the global warming crisis. Because they take millions of years to form, fossil fuels are considered non-renewable fuels.

Fuel Cell - An electrochemical engine with no moving parts that converts the chemical energy of a fuel, such as hydrogen, and an oxidant, such as oxygen, directly to electricity. The principal components of a fuel cell are catalytically activated electrodes for the fuel (anode) and the oxidant (cathode) and an electrolyte to conduct ions between the two electrodes.

Fuel Cell Vehicle (FCEV) - A fuel cell vehicle generates power by combining hydrogen fuel and oxygen to produce electricity. The only emission from this type of vehicle is water.

Fuel consumption - The amount of fuel consumed in a given distance (e.g., gallons per 100 miles). This is the inverse of fuel economy.

Fuel economy - Fuel Economy refers to the average number of miles travelled per gallon of fuel consumed.

Gas to Liquid Technology - Gas-to-liquid conversion technologies use chemical or physical means to convert natural gas to a liquid form suitable for ready transport or direct use.

Gasohol - In the United States, gasohol (E10) refers to gasoline that contains 10% ethanol by volume. This term was used in the late 1970s and early 1980s but has been replaced in some areas of the country with E10, super unleaded plus ethanol, or unleaded plus.

Gasoline Gallon Equivalent (gge) - A unit for measuring alternative fuels so that they can be compared with gasoline on an energy equivalent basis. This is required because the different fuels have different energy densities.

Greenhouse Gas (GHG) - Are defined to include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride.

Gross Vehicle Weight Rating (GVWR) - Maximum weight of a vehicle, including payload.

Heavy-Duty Vehicle - Generally, a vehicle that has a GVWR of more than 26,000 lb. Definitions vary by organization.

Hybrid Electric Vehicle (HEV) - A vehicle powered by two or more energy sources, one of which is electricity. HEVs may combine the engine and fuel of a conventional vehicle with the batteries and electric motor of an electric vehicle in a single drivetrain.

Hybrid Vehicles - Hybrid vehicles use a combination of two or more power sources designed to lower emissions and improve fuel economy. Hybrid cars commonly use fuel-efficient gasoline engines in conjunction with battery-powered electric motors.

Hydrogen - Although hydrogen can fuel an engine directly, or serve as a fuel additive, the current emphasis is on the use of hydrogen to supply fuel cells, which power electric vehicles. Hydrogen has also been blended with methane to form a fuel called Hythane.

Infrastructure - In transportation, this term generally refers to the charging and fueling network necessary to successful development, production, commercialization, and operation of alternative fuel vehicles. It includes fuel supply, public and private charging and fueling facilities, standard specifications for fueling outlets, customer service, education and training, and building code regulations.

Inherently Low Emission Vehicle (ILEV) - This is a Federal standard only. Such a vehicle meets EPA CFV ILEV exhaust emission standards and produces very few or no evaporative emissions (5 grams or less per test without using auxiliary emission control devices). ILEVS are dedicated AFVs in most cases. Dual-fuel vehicles will be considered ILEVs only if both fuels meet the standard. ILEV credits can be banked in the Consolidated Metropolitan Statistical Area.

Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) - An omnibus act that further integrates the national intermodal surface transportation system and authorizes funds for highway construction, highway safety programs, and mass transit programs. ISTEA seeks a national intermodal surface transportation system that is economical, energy

efficient, and environmentally sound. Section 1008 of the ISTEA establishes the Congestion Mitigation and Air Quality Improvement Program, which can provide funds to support alternative fuel and alternative fuel vehicle programs.

Light-Duty Vehicle - Passenger cars and trucks with a gross vehicle weight rating of 8,500 or less.

Liquefied Petroleum Gas (LPG) - Compressed natural gas that is cryogenically stored in its liquid state. A mixture of hydrocarbons found in natural gas and produced from crude oil, used principally as a feedstock for the chemical industry, home heating fuel, and motor vehicle fuel. Also known by the principal constituent propane.

LNG to CNG Station - A station, supplied with LNG, that pumps and vaporizes the liquid supply to vehicles as CNG fuel, generally at the correct pressure and temperature (i.e., the temperature effect of compression is factored into the design).

LNG vehicle - A vehicle that uses LNG as its fuel.

Low-Emission Vehicle (LEV) - A vehicle that meets EPA's CFV or LEV standards or CARB's California LEV standards.

M100 - 100% (neat) methanol.

M85 - 85% methanol and 15% unleaded gasoline by volume, used as a motor fuel in FFVs.

Medium-Duty Vehicle - Typically, a vehicle with a GVWR of 8,500 to 14,000 lb.

Methane (CH4) - The simplest of the hydrocarbons and the principal constituent of natural gas. Pure methane has a heating value of 1,012 Btu per standard cubic foot.

Methanol (also known as Methyl Alcohol, Wood Alcohol, CH3 OH) - A liquid fuel formed by catalytically combining CO with hydrogen in a 1 to 2 ratio under high temperature and pressure. Commercially, it is typically manufactured by steam reforming natural gas. Also formed in the destructive distillation of wood.

Methyl Ester - A fatty ester formed when organically derived oils are combined with methanol in the presence of a catalyst. Methyl Ester has characteristics similar to petroleum-based diesel motor fuels.

Methyl Tertiary Butyl Ether (MTBE) - A fuel oxygenate used as an additive to gasoline to increase octane and reduce engine knock. According to the U.S. Environmental Protection Agency, MTBE has been detected in ground water across the country, sometimes contaminating drinking water. Recent work by EPA and other researchers is expected to help determine the potential for health effects from MTBE in drinking water.

Mobile Source Emissions - Emissions resulting from the operations of any type of motor vehicle.

Motor Octane - The octane as tested in a single-cylinder octane test engine at more severe operating conditions. Motor octane number (MON) affects high-speed and part-throttle knock and performance under load, passing, climbing, and other operating conditions. Motor octane is represented by the designation M in the (R+M)/2 equation and is the lower of the two numbers.

National Ambient Air Quality Standards (NAAQS) - Ambient standards for air pollutants specifically regulated under the CAA. These pollutants include ozone, CO, NO2, lead, PM, and SOx.

National Automotive Technical Education Foundation - A consortium of automotive education experts that has established a steering committee to administer the CHAMP certification process at educational institutions.

Natural Gas - A mixture of gaseous hydrocarbons, primarily methane, occurring naturally in the Earth and used principally as a fuel. Natural gas is a clean-air alternative to conventional fuel. It is used in vehicles as compressed natural gas (CNG) or liquefied natural gas (LNG). There are limited fueling sites for natural gas.

Natural Gas Distribution System - This term generally applies to mains, services, and equipment that carry or control the supply of natural gas from a point of local supply, up to and including the sales meter.

Natural Gas Transmission System - Pipelines installed for the purpose of transmitting natural gas from a source or sources of supply to one or more distribution centers.

Natural Gas Vehicle - Vehicles that are powered by compressed or liquefied natural gas.

Near Neat Fuel- Fuel that is virtually free from admixture or dilution.

Neat Alcohol Fuel - Straight or 100% alcohol (not blended with gasoline), usually in the form of either ethanol or methanol.

Neat Fuel - Fuel that is free from admixture or dilution with other fuels.

Non-Methane Organic Gases (NMOG) - The sum of non-oxygenated and oxygenated hydrocarbons (exclusive of methane) contained in a gas sample as measured in accordance with California's non-methane organic gas test procedure.

Non-Road Vehicle (off-road vehicle) - A vehicle that does not travel streets, roads, or highways. Such vehicles include construction vehicles, locomotives, forklifts, tractors, golf carts, and others.

Octane Enhancer - Any substance such as MTBE, ETBE, toluene, or xylene that is added to gasoline to increase octane and reduce engine knock.

Octane Rating (Octane Number) - A measure of a fuel's resistance to self-ignition, hence a measure as well of the antiknock properties of the fuel.

OEM - Original equipment manufacturer.

Off-Road - Any non-stationary device, powered by an internal combustion engine or motor, used primarily off the highways to propel, move, or draw persons or property, and used in any of the following applications: marine vessels, construction/farm equipment, locomotives, utility and lawn and garden equipment, off-road motorcycles, and off-highway vehicles.

Onboard Refueling Vapor Recovery (ORVR) - System required on vehicles beginning in 1998 to control refueling emissions.

Open-Loop Fuel Control - System in which the air/fuel mixture is preset by design with no feedback correction signal to optimize fuel metering.

Original Equipment Manufacturer (OEM) - The original manufacturer of a vehicle or engine.

Oxides of Nitrogen (NOx) - Regulated air pollutants, primarily NO and NO2 but including other substances in minute concentrations. Under the high pressure and temperature conditions in an engine, nitrogen and oxygen atoms in the air

react to form various NOx. Like hydrocarbons, NOx are precursors to the formation of smog. They also contribute to the formation of acid rain.

Oxygenate - A term used in the petroleum industry to denote fuel additives containing hydrogen, carbon, and oxygen in their molecular structure. Includes ethers such as MTBE and ETBE and alcohols such as ethanol and methanol.

Oxygenated Fuels - Fuels blended with an additive, usually methyl tertiary butyl ether (MTBE) or ethanol to increase oxygen content, allowing more thorough combustion for reduced carbon monoxide emissions.

Oxygenated Gasoline - Gasoline containing an oxygenate such as ethanol or MTBE. The increased oxygen content promotes more complete combustion, thereby reducing tailpipe emissions of CO.

Ozone - Tropospheric ozone (smog) is formed when volatile organic compounds (VOCs), oxygen, and NOx react in the presence of sunlight (not to be confused with stratospheric ozone, which is found in the upper atmosphere and protects the earth from the sun's ultraviolet rays). Though beneficial in the upper atmosphere, ground-level ozone is a respiratory irritant and considered a pollutant.

Particulate Matter (PM) - A generic term for a broad class of chemically and physically diverse substances that exist as discrete particles (liquid droplets or solids) over a wide range of sizes. A NAAQS pollutant.

Particulate Trap - Diesel vehicle emission control device that traps and incinerates diesel particulate emissions after they are exhausted from the engine but before they are expelled into the atmosphere.

Petroleum Fuel - Gasoline or diesel fuel.

Portable Fueling System - A system designed to deliver natural gas to fueling stations. Such systems are usually configured as tube trailers and are mobile. Fuel delivery usually occurs via over-the-road vehicles.

Propane - Propane is usually used in the form of liquefied petroleum gas (LPG). Again, the availability of refueling sites is an issue for vehicles that run on this fuel.

Propane (C3H8) - A gas whose molecules are composed of three carbon and eight hydrogen atoms. Propane is present in most natural gas in the United States, and is refined from crude petroleum. Propane contains about 2,500 Btu per standard cubic foot. Propane is the principal constituent in liquefied petroleum gas (LPG).

P-series - P-series fuels are new fuels that are now classified as an alternative fuel. The fuels are blends of methyltetrahydrofuran (MTHF), ethanol and hydrocarbons. The fuels contain at least 60 percent non-petroleum energy content derived from MTHF (manufactured solely from biomass feedstocks) and ethanol.

P-Series Fuels - Fuels designed by the Pure Fuel Corporation to run in E85/gasoline flexible fuel vehicles. Added by DOE after EPAct as an alternative fuel.

Pump Octane - The octane as posted on retail gasoline dispensers as (R+M)/2; same as Antiknock Index.

Reformulated Gasoline (RFG) - Gasolines that have had their compositions or characteristics altered to reduce vehicular emissions of pollutants, particularly pursuant to EPA regulations under the CAA.

Refueling Emissions - VOC vapors that escape from the vehicle fuel tank during refueling. Storage II pump controls and onboard refueling vapor recovery systems (ORVR) are intended to control these emissions.

Renewable Fuels - Renewable fuels are produced from resources that are current, available, and can be replenished, such as hydrogen and fuels made from plant matter. Fossil fuels, in contrast, are non-renewable fuels because they are derived from the natural resources of buried dead organisms that lived millions of years ago.

Research Octane Number (RON) - The octane as tested in a single-cylinder octane test engine operated under less severe operating conditions. RON affects low-to medium-speed knock and engine run-on. Research Octane is presented by the designation R in the (R+M)/2 equation and is the higher of the two numbers.

Retrofit - To change a vehicle or engine after its original purchase, usually by adding equipment such as conversion systems.

Spark Ignition Engine - Internal combustion engine in which the charge is ignited electrically (e.g., with a spark plug).

State Energy Program - Program offered by the U.S. Department of Energy that allows states to compete for funding to implement activities related to programmatic areas, such as Federal energy management, building codes and standards, alternative fuels, industrial efficiency, building efficiency, and renewable energy technologies.

State Implementation Plan (SIP) - Plan that a state must submit to EPA under the CAA to demonstrate compliance to NAAQS.

Sulphur Dioxide (SO2) - An EPA criteria pollutant

Super Ultra-Low-Emission Vehicle (SULEV) - A vehicle that produces fewer exhaust emissions than do ultra-low-emission vehicles. ULEV credits can also be banked in the Consolidated Metropolitan Statistical Area.

Tailpipe Emissions - EPA-regulated vehicle exhaust emissions released through the vehicle tailpipe. Tailpipe emissions do not include evaporative and refueling emissions, which are also regulated by EPA. EPA publishes allowable emission levels and vehicle certification standards in the Code of Federal Regulations.

Tertiary Amyl Ethyl Ether (TAEE) - An ether based on reactive C5 olefins and ethanol.

Tertiary Amyl Methyl Ether (TAME) - An ether based on reactive C5 olefins and methanol.

Tetraethyl Lead or Lead - An octane enhancer. One gram of lead increases the octane of one gallon of gasoline about 6 numbers. The EPA has phased down the use of lead in gasoline as it has been determined to be a health hazard. Lead has been prohibited in highway vehicle gasoline since January 1, 1996.

Toluene - Basic aromatic compound derived from petroleum and used to increase octane. The most common hydrocarbon purchased for use in increasing octane.

Toxic Emission - Any pollutant emitted from a source that can negatively affect human health or the environment.
Transesterification - A process in which organically derived oils or fats are combined with alcohol (ethanol or methanol) in the presence of a catalyst to form esters (ethyl or methyl ester).

Transitional Low - Emission Vehicle (TLEV) - Describes a vehicle that meets either EPA's CFV TLEV standards or CARB's California Low-Emission Vehicle Program TLEV standards. TLEVs produce fewer emissions than Federal Tier 1 vehicles. TLEVs are eligible for the Federal California Pilot Program but not eligible for the Clean-Fuel Fleet Program.

Transportation Control Measures (TCM) - Restrictions imposed by state or local governments to limit use or access by vehicles during certain times or subject to specific operating requirements, e.g., high-occupancy vehicle lanes.

Ultra-Low-Emission Vehicle (ULEV) - Describes a vehicle that meets either EPA's CFV ULEV standards. ULEVs produce fewer emissions than LEVs. Fleets that purchase CFV ULEVs may earn credits under the Clean-Fuel Fleet Vehicle Program. Manufacturers that sell CFV ULEVs may earn credits under the Federal California Pilot Program.

Vapor Pressure or Volatility - The tendency of a liquid to pass into the vapor state at a given temperature. With automotive fuels, volatility is determined by measuring RVP.

Variable Fuel Vehicle (VFV) - A vehicle that has the capacity of burning any combination of gasoline and an alternative fuel. Also known as a flexible-fuel vehicle.

Vehicle Allocation Methodology (VAM) - Vehicle Allocation Methodology is a process that will assist in achieving a fleet that is the right size and type for the agency's mission.

Vehicle Conversion - Retrofitting a vehicle engine to run on an alternative fuel.

Vehicle Miles Travelled (VMT) - The miles travelled by motor vehicles over a specified length of time (e.g. daily, monthly, or yearly) or over a specified road or transportation corridor.

Volatile Organic Compound (VOC) - Reactive gas released during combustion or evaporation of fuel and regulated by EPA. VOCs react with NOx in the presence of sunlight and form ozone.

Voluntary Mobile Source Emission Reduction Program - A program established by EPA to encourage voluntary emission reduction programs that can be part of a state implementation program.

Xylene - An aromatic hydrocarbon derived from petroleum and used to increase octane. Highly valued as a petrochemical feedstock. Xylene is highly photochemically reactive and, as a constituent of tailpipe emissions, is a contributor to smog formation.

Zero Emission Vehicle (ZEV) - A vehicle that emits no tailpipe exhaust emissions. ZEV credits can be banked within the Consolidated Metropolitan Statistical Area.