

ALTERNATIVE FUEL USE  
IN COLORADO

Kim B. Livo  
Dr. Jerry Gallagher  
Martin W. Boyd  
Air Pollution Control Division  
Colorado Department of Health  
4300 Cherry Creek Drive South  
Denver, Colorado 80222

Abstract

The use of alternative fuels hold the promise of promoting energy diversity and reducing motor vehicle emissions. With the passage of the federal Clean Air Act Amendments of 1990, the National Energy Policy Act of 1992, and state initiatives such as from California, these fuels will have a far reaching influence on the fuels motor vehicle fleets operate on in the next century.

Many of the emission benefits of alternative fuels are dependent on the quality of the alternative fuel implementation, as well as the fuels themselves. To prevent degradation of motor vehicle emissions, the Colorado Department of Health has implemented alternative fuel retrofit system certification procedures. These, as well as EPA and California certification standards will allow present vehicles to have acceptable emissions, as well as future vehicles to meet required low emission standards.

Introduction

Transportation fuels have been at the heart of two major public policy issues facing the United States for the last several decades; pollution caused by motor vehicles, and the growing dependence on imported oil. Clean fuels, such as alternative fuels, are of increasing importance as a way to lower motor vehicle emissions. Diversification of transportation fuels is equally important, and will lessen or mediate future supply disruptions or price hikes which were saw in the oil shocks of the 1970s.

In Colorado, alternative fuel use has been growing dramatically since the start of the 1990s. Today there are more than 5000 vehicles capable of operating on alternative fuels. This growth is posing significant challenges to the fuels industry and fleet users. To support the expanding vehicle fleet, the fuels industry has been actively expanding the alternative fuel infrastructure. In turn, fleet users are being challenged to integrate and maintain new types of vehicles and fuels.

Background

Alternative fuel use in Colorado, and elsewhere, is been shaped largely by two significant pieces of federal legislation, the Clean Air Act Amendments of 1990 and the National Energy Policy Act of 1992. Developments in California are also effecting

alternative fueled motor vehicle use, as California "low emitting vehicle", "ultra low emitting vehicle" and "zero emitting vehicle" standards are driving the entire alternative fueled vehicle market

#### The Clean Fleet Fuels Program

The Clean Air Act Amendments of 1990 mandate the use of clean fuels for fleets, mainly as part of the Clean Fleet Fuels Program. This program is scheduled to begin in 1998 for public and private fleet of ten or more vehicles which are centrally refueled.

The Clean Fleets Fuels Program affects fleets in 21 ozone and one carbon monoxide non-attainment areas with populations of 250,000 or more based on the 1980 census. The program applies to automobiles and light and heavy duty trucks up to 26,000 pounds gross vehicle weight.

The Clean Fleet Fuels program is as the name suggests, a "clean" fuels program. It is a program which stresses air quality, rather than type of fuel, so is a performance, rather than alternative fueled, based program. To participate, a fuel/vehicle combination must meet the same standard as the California low emitting vehicle standard.

It is expected that alternative fuels will have an advantage in meeting the specific emission requirements of this program, but reformulated gasolines and clean diesel fuels may also participate. Any fuel, in combination with vehicle technology, which meets the standard is eligible for this program. This includes alternative fuels such as natural gas, propane, methanol, ethanol, and electricity, as well as clean gasolines and diesel fuels. Some types of vehicles will be exempted to this program. They include emergency and law enforcement vehicles, and vehicles which are garaged at home.

#### National Energy Policy Act of 1992

A second federal program expected to fuel the market for alternative fuels and fueled vehicles this decade and next, is the National Energy Policy Act of 1992. This act, unlike the Clean Fleet Fuels Program, is designed strictly to increase the use of alternative fuels and fueled vehicles. It mandates that certain fleets purchase alternative fueled vehicles.

The National Energy Policy starts in 1993 for the Federal fleet, and 1996 for State fleets and fuel provider fleets. Private and municipal fleets may have to participate also, as early as 1999, if the Secretary of Energy makes a determination that national alternative fuel usage goals require their inclusion to be met.

The National Energy Policy act affects all metropolitan areas in the United States with a population of over 250,000 people at the time of the 1980 census. It covers eligible fleets of fifty or more vehicles, with at least 20 or more in any one area. It affects vehicles with weights up to 8500 GVW. In addition, the covered vehicles must be capable of being centrally refueled.

Unlike the Clean Fleet Fuels Program, this program is an energy diversity program, so is not standards driven but rather alternative fuel driven. Alternative fuels which comply include, natural gas, propane, methanol, ethanol, and electricity.

Exempted vehicles for this program include, emergency and law enforcement vehicles, and vehicles garaged at home. At the discretion of the Secretary of Energy, the exemption for law enforcement vehicles may be waived.

#### State and Local Incentives

Colorado, because of air quality issues, as well as economic developmental reasons has encouraged the use of alternative fuels. In terms of air pollution, alternative fuels do hold the promise of reducing vehicle emissions which contribute to Colorado's winter-time carbon monoxide and PM-10 problems, and year round visibility concerns.

But showing promise does not necessarily lead to a solution. Mass emissions testing conducted by the Colorado Department of Health (CDH), has shown that not all alternative fueled vehicles are low emitting. As with traditional vehicles, good design and proper vehicle maintenance are needed to obtain and maintain appropriate vehicle emission levels. To assure that alternative fueled vehicles meet applicable emissions standards, the CDH regulates vehicle conversions through Air Quality Control Commission Regulation No. 14. Through this regulation, only CDH certified retrofit systems are allowed on vehicle conversions.

To encourage the use of alternative fueled vehicles, the state, and local municipalities, have adopted a number of incentive programs. One of the first programs established was a state fleet program which requires the state fleet manager to purchase or convert a number of vehicles to alternative fuels each year. Beginning in fiscal year 1991, the goal was 10% of all new vehicle purchases. This has been increased to 40% for the fiscal 1994 year.

The city of Denver has adopted a more pervasive ordinance, No. 330, administered by the City of Denver Health and Hospitals, requiring 10% of all fleet vehicles to be alternatively fueled for fleets of 30 or more vehicles. Diesel powered vehicles are excepted from conversion requirements, but are counted as part of that 30 or more vehicles.

#### Governor's Alternative Fuels Task Force

To encourage the use of alternative fuels, Colorado's governor, Governor Romer, established a Governor's Alternative Fuels Task Force. It was charged with the task of investigating ways of furthering the use of alternative fuels. This Task Force, composed of local state, county, and municipal officials, as well as citizens, met for over a year in determining the direction Colorado should take in meeting both clean air goals and economic development.

The principle recommendation of the Task Force was that Colorado implement a Clean Fleet Fuels Program as required by the Clean Air Act Amendments of 1990. Such a program should be implemented as soon as possible before the 1998 deadline. The task force also recommended an incentive program be developed to promote fuels such as CNG and propane which could reduce carbon monoxide emissions from appropriate vehicles. As a gas producing state, the use of fuels such as CNG and propane were also favored as a way of meet both clean air objectives, as well as economic development goals.

The recommendations of the Task force were given statutory authority through the passage of House Bill 1305. House Bill 1305 authorized the Colorado Clean Vehicle Fleet Program, which will conform with the federal Clean Fleet Fuels Program mandated by Clean Air Act Title I, Part D and Title II, Part C, 1990.

The Colorado program will affect fleets with 10 or more vehicles in the Denver-Boulder CO non-attainment area. Colorado is the only state participating in the Clean Fleet Fuels Program strictly due to having a carbon monoxide non attainment area. Other states which have areas required to implement this program, and are in nonattainment for carbon monoxide, are also nonattainment for ozone.

By House Bill 1305, the Colorado Air Quality Control Commission was given the authority to promulgate rules and regulations for the implementation of this program. At the present time, the AQCC is preparing a regulation which will implement the program.

House Bill 1305 also authorizes the establishment of a mechanic certification program for vehicle conversions, and authorizes the establishment, but does not fund, an alternative fuels rebate program authorized to rebate up to half the cost of a vehicle conversion, or the alternative fueled vehicle premium on new vehicles. Such vehicles must demonstrate that reductions in carbon monoxide emissions, as well as for fine particulate matter, visibility pollutants will be achieved.

#### Other Activities

As in other states, there is also much activity being conducted through federally funded pilot programs, such as the Regional Transportation District operation of five large over the road methanol fueled transit buses, as well as large and smaller CNG powered buses. The U.S. Government Accounting Office is also in the process of obtaining a fleet of methanol flexible fueled automobiles. Coors brewing is operating an ethanol powered semi-truck tractor and a fleet of propane powered vans. Many other private and governmental fleets are also now operating CNG or propane powered vehicles.

The National Renewable Energy Lab is in the process of developing ways of lowering ethanol production costs. The Colorado School of Mines has established a heavy duty emissions laboratory, and Colorado State University has established a light duty emissions laboratory which are both measuring motor vehicle emissions from alternative fueled vehicles.

#### Conclusion

Presently almost all transportation fuels used are derived from oil. Increasingly that oil is imported. In 1990 it is estimated that close to half of all oil consumed in the United States was imported. With consumption increasing and production decreasing, it is expected that by the year 2010, approximately 70% of all oil consumed in the United States will be imported, if the measures in the National Policy Act are not implemented.

New federal clean fuel requirements will pose a significant challenge to states in the future. New alternative fuel infrastructures will have to be created. New motor vehicle designs will also be needed to utilize those fuels for maximum air quality and vehicle performance benefit. The potential is there to take advantage of the different characteristics of the new clean fuels to lower vehicle emissions as well as develop secure supplies of North American produced fuel.