ENVIRONMENTAL
Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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A Closer Look at Gasoline

Improving Air Quality in New Hampshire

The Federal Clean Air Act requires states to implement programs to reduce ground-level ozone commonly referred to as "smog." Ozone is formed when hydrocarbon emissions react with nitrogen oxides in the presence of sunlight and heat. In New Hampshire, ozone levels are generally highest in the four southern most populated counties of Rockingham, Strafford, Hillsborough and Merrimack because up to 50 percent of the state's ozone-creating emissions are generated by motor vehicles. New Hampshire has implemented several strategies aimed at reducing vehicle emissions including the requirement that vehicles use cleaner burning gasoline.

The gasoline supply in New Hampshire is getting cleaner and better for the environment in response to both federal and state legislation first enacted in 2005. The petroleum industry responded to bills passed by Congress and the New Hampshire General Court by replacing Methyl tertiary-Butyl Ether (MtBE), added to gasoline to increase octane and reduce emissions, with cleaner, renewable ethanol made from corn and other renewable biomass. The transition to this less-polluting gasoline is largely transparent to the average consumer. However, there could be engine or fuel system problems for a very small number of pre-1980 vehicles or for other older engines such as used in snowmobiles and lawn mowers. The following information should address consumers' concerns related to conversion from MtBE to ethanol in gasoline.

Why are there different types of gasoline in New Hampshire?

New Hampshire has two basic types of gasoline: reformulated gas (RFG) and conventional gas. RFG conforms to pollution reduction requirements established by the EPA. "Conventional gasoline" refers to gasoline that does not meet pollution reduction requirements. Both types may include some level of ethanol that is an "oxygenate" used to supply additional oxygen to increase octane levels, enhance combustion and reduce emissions.

In New Hampshire, the use of RFG is part of the State Implementation Plan (SIP), the state's written strategy to reduce ozone in the four southeastern counties of Merrimack, Hillsborough, Rockingham and Strafford counties. Due to its cleaner burning characteristics, RFG use results in reductions of toxic air pollutants and ozone forming chemicals emitted from motor vehicles. RFG significantly reduces the levels of many of these pollutants, thereby lessening associated air quality problems and projected risk to public health.

Why did gasoline change in New Hampshire

Originally, the federal Clean Air Act required RFG to contain oxygenates such as MtBE to increase gasoline's oxygen content increasing the octane level and allowing it to burn cleaner.

However, MtBE was found to travel long distances underground and contaminate groundwater so in 2005, the New Hampshire Legislature banned its use. EPA's Energy and Policy Act of 2005 also eliminated the MtBE requirement but mandated the use of biofuel (usually ethanol) that must be mixed with gasoline to increase the octane level. The Energy Independence and Security Act of 2007 set an average vehicle fuel economy goal of 35.5 miles per gallon to be achieved by 2020. In addition, that Act provided a federal tax incentive for refiners and distributors thus creating an industry incentive to use certain gasoline blends and higher volumes of ethanol.

These various requirements resulted in greater flexibility for the petroleum industry and an increase in the amount of ethanol in gasoline distributed in the Northeast. Most suppliers use ethanol to achieve the necessary octane level and increase its use in order to take advantage of the federal tax incentive. Many refiners supply up to 10 percent by volume of ethanol in gasoline (also referred to as E10). However, different areas of the state receive different blends, some with no ethanol at all, depending on price and supply.

How can I tell if the gasoline I purchase contains ethanol?

Consumers should notice little, if any, difference in ethanol blended gasoline as far as vehicle performance. Some sources have reported a minor decrease in fuel economy of between 1 and 3 percent. For example, a vehicle getting 25 mpg might go down to 24.25 mpg, but it is doubtful that most motorists would notice this difference.

Since ethanol is highly soluble in water, ethanol blended gasoline is not compatible with water in storage tanks, even at relatively small amounts. Ethanol must be transported and blended into gasoline at the pump in order to avoid contact with water, sludge, and scale that may be present in distribution tanks and pipelines. While there is no specific labeling requirement in New Hampshire, DES recommends that pumps be labeled appropriately to disclose the presence of ethanol-blended gasoline. If in doubt, ask the station manager or operator.

What problems may be encountered with ethanol blended gasoline?

The vast majority of engines should not encounter any performance related problems. However, certain engine/fuel system components in pre-1980 engines may not be compatible with ethanol. For example, certain types of rubber used in seals and hoses may deteriorate more rapidly when exposed to ethanol blended gasoline.

Ethanol acts as a solvent to break up and dissolve sludge and scale that may have accumulated in storage tanks over time. Ethanol may also re-dissolve scale or sludge in the vehicle fuel tank and potentially carry it into the vehicle fuel system, clogging fuel lines and filters. Water/methanol mixtures may also separate, allowing water to collect in fuel lines and filters stalling the engine or causing poor performance.

The likelihood of these problems is remote. However, if consumers notice problems shortly after filling up with ethanol blended fuels, they should notify the station where the fuel was purchased to see if similar problems have been reported, and take the vehicle to a qualified technician immediately.

What about vehicles other than cars?

Boats, motorcycles, snowmobiles, ATVs, lawn and garden equipment, and other gasoline engines may encounter similar problems. If the vehicle engine or fuel system is pre-1980, contact the manufacturer for recommendations. If engine or fuel system performance problems related to ethanol blended gasoline are encountered, notify the station immediately and seek assistance from a qualified engine technician.

Reformulate Gasoline Program

The reformulated gasoline program is a very cost-effective program for the reduction of hydrocarbon and air toxic emissions. The program is administered by EPA, so there are no administrative costs to New Hampshire. According to EPA, the estimated cost increase to produce reformulated gasoline is only a few cents per gallon due to the refining of the gasoline. However, the overall cost of this program is less than the cost of some alternatives, such as imposing stricter controls on the manufacturing and industrial facilities of the state.

General and technical information on reformulated gasoline is available at EPA's web site at: http://www.epa.gov/otaq/fuels/gasolinefuels/rfg/index.htm.