



NH Converts to More Environmentally Friendly Ethanol Based Gasoline

Frequently Asked Questions **March 3, 2006**

The gasoline supply in New Hampshire is getting cleaner and better for the environment in response to both federal and state legislation enacted last year. The petroleum industry has responded to both bills passed by Congress and the New Hampshire General Court by replacing Methyl tertiary Butyl Ether (MtBE) with cleaner, renewable ethanol made from corn and other renewable biomass. This transition to less polluting gasoline should be, for the most part, completely transparent to the average consumer. However, you should be aware that if station owners do not take the correct steps to prepare their tanks for ethanol blended gasoline, or for a very small number of older (pre-1980) vehicles and engines, there could be sporadic engine/fuel system problems. The following information addresses questions consumers may have about this conversion. For additional information, please contact Mike Fitzgerald at the N.H. Department of Environmental Services at 271-6390 or mfitzgerald@des.state.nh.us.

What types of gasoline are used in New Hampshire? What is RFG?

New Hampshire has two basic types of gasoline – reformulated gas (RFG) and conventional gas. Both of these types may include some level of MtBE or ethanol, compounds also known as oxygenates that supply additional oxygen to enhance combustion and reduce emissions. These compounds are also often added to enhance the octane level of the gasoline.

- RFG, required in the southeastern four counties of New Hampshire (Merrimack, Hillsborough, Rockingham, and Strafford counties) and several other areas of the country burns more cleanly and reduces air pollution from cars using it.
- Conventional gas is a term used to refer to gasoline that does not meet the pollution reduction requirements established by EPA for RFG.

Why is the gasoline supply in New Hampshire changing?

Gasoline in New Hampshire, as well as several other Northeast states, and many states nationally is changing in response to three significant legislative actions:

- **Removal of RFG oxygen mandate** - The Energy Policy Act of 2005 (EPACT) removed the federal Clean Air Act mandate requiring 2% oxygen in RFG as of May 5, 2006. The oxygen was previously supplied by adding oxygenates, either approximately 11% volume per volume MtBE or 6% volume per volume ethanol. Removal of this provision allows refiners greater flexibility to reduce the oxygen content.

- **National Renewable Fuels Standard** - EPACT also mandated an increase in the amount of renewable fuels used in gasoline nationally. Although several types of renewable fuels can potentially meet this requirement, in practice the bulk of the national requirement will be met by adding ethanol. In 2006 the national requirement is 2.78 % renewable fuel content, or 4.0 billion gallons, rising to 7.5 billion gallons by 2012. This requirement applies nationally; no New Hampshire specific requirement is set.
- **New Hampshire MtBE ban** – Effective January 1, 2007, RSA 146-G:12 prohibits the sale, delivery, for sale, and the importation of gasoline containing MtBE and other ether oxygenates in New Hampshire. The states of Maine, Vermont, and Rhode Island have enacted similar bans.

In addition a federal tax incentive for refiners and distributors exists for certain gasoline blends of ethanol, creating an industry incentive to use higher volumes of ethanol.

How will this change the gasoline supplied in New Hampshire?

The net result of these various requirements is that the petroleum industry will have greater flexibility, and most likely the amount of ethanol in gasoline distributed in the Northeast will increase. Note that suppliers still must provide RFG in the four county area, but after May 5 they will have the flexibility to reduce MtBE until January 1, 2007, the effective date of the legislative ban. Most suppliers will likely use ethanol to provide the necessary octane starting sometime later this year, and may increase its use in order to take advantage of the federal tax incentive. Many refiners will supply up to 10% v/v ethanol in gasoline, a blend also referred to as E10. However different areas of the state will receive different blends, possibly some with no ethanol at all, depending on price and supply issues.

What are the differences between gasoline blended with MtBE and ethanol?

Most consumers should not notice any difference in ethanol blended gasoline as far as vehicle performance. Some sources have reported a minor decrease in fuel economy of between 1-3%, which is within the accuracy of motorists to determine the variation (i.e., a vehicle currently getting 25 mpg might go down to 24.25 mpg – it is doubtful most motorists maintain records accurate enough to 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 terminal (as opposed to MtBE, which is blended at the refinery) in order to avoid contact with water, sludge, and scale that may be present in distribution tanks and pipelines.

Certain older vehicles and engines may incur problems with ethanol blended gasoline, and if station owners do not take appropriate precautions in converting storage tanks from

MtBE blends to ethanol blended gasoline, motorists could experience performance problems (see more below).

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

While there is no specific requirement, DES and other state agencies are recommending 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?

By far the vast majority of engines should not encounter any performance related problems. However, certain engine/fuel system components in older (pre 1980) engines may not be compatible with ethanol. For instance, certain types of rubber used in seals and hoses may deteriorate more rapidly when exposed to ethanol blended gasoline. If you have any questions about your vehicle systems compatibility with ethanol blended gasoline, please contact your engine manufacturer.

As mentioned above, ethanol blended gasoline is not compatible with water, and also acts as a solvent to break up and dissolve sludge and scale that may have accumulated in storage tanks over time. In order to avoid problems, before converting to ethanol blends station owners must remove all previously accumulated water, sludge and scale in tanks intended for storage of ethanol blends. If tanks are not appropriately prepared for this conversion, two problems can occur;

- Water in the tank can cause ethanol to separate into the water phase, resulting in either water being introduced into the engine fuel system or the octane content of the gas being reduced below engine driving requirements. Both of these conditions may cause poor performance or engine stalling
- Ethanol may re-dissolve scale or sludge in the tank and potentially carry it into the vehicle fuel system, clogging fuel lines and filters.

The likelihood of either of these problems is remote. However, if consumers notice problems shortly after filling up with ethanol blended fuels, you 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. The problem could be as simple as a plugged fuel line or filter, or may require draining bad gasoline out of the fuel system.

What about vehicles other than cars?

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