Prepared Witness Testimony

The Committee on Energy and Commerce
W.J. "Billy" Tauzin, Chairman

Issues Concerning the Use of MTBE in Reformulated Gasoline: An Update.

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Mr. Chairman, my name is A. Blakeman Early. I am pleased to appear today on behalf of the American Lung Association to discuss the use of MTBE in Reformulated Gasoline (RFG). The American Lung Association has long been a supporter of the use of RFG as an important tool that many areas can and should use to reduce unhealthy levels of ozone.

Clean Fuels Help Reduce Smog

As has been demonstrated in California, “clean” gasoline can be an effective tool in reducing car and truck emissions that contribute to smog. Based on separate cost effectiveness analyses conducted by both the U.S. EPA and the State of California, when compared to all available control options, reformulated gasoline (RFG) is a cost-effective approach to reducing the pollutants that contribute to smog.[1] Compared to conventional gasoline, RFG has also been show to reduce toxic air emissions from vehicles by approximately 30 percent.[2]

The American Lung Association Supports the Phase Out of MTBE in All Gasoline

As a member of the Blue Ribbon Panel on Oxygenates in Gasoline, the American Lung Association learned of the significant threat that MTBE poses to the nation’s water supplies. We also came to understand that the continued use of MTBE in RFG would contribute to the undermining of public support for the RFG program. Based on these two factors, we have supported the Blue Ribbon Panel recommendation that MTBE be phased out of all gasoline, not just RFG. We believe there is a broad consensus in support of the MTBE phase out.

Elimination of the Oxygen Mandate in RFG Must Accompany any MTBE Ban

If Congress were to ban MTBE and not eliminate the oxygen requirement for federal RFG a de facto ethanol mandate would be created. In essence, all RFG in the nation would be required to contain a minimum of 5.7% by volume ethanol (2% by weight oxygen). **The American Lung Association firmly believes that mandating ethanol in summertime gasoline will contribute to increases in smog regardless of whether the fuel is RFG or conventional gasoline.**

Quite simply the big problem with ethanol use in gasoline is that it significantly increases volatility when mixed in

gasoline at levels above 2 percent by volume. Reducing gasoline volatility during hot summer weather is one of the most important strategies for improving summertime gasoline in order to reduce smog. That is because with the advance of pollution equipment on automobiles, evaporation of gasoline hydrocarbons contributes more to smog in most areas than do tailpipe hydrocarbon emissions. The volatility increases that ethanol causes in summertime can overwhelm any benefit it provides in reducing CO tailpipe emissions, sulfur dilution or aromatics dilution. That is why the ethanol industry only talks about the tailpipe emissions benefit from ethanol in RFG. The ethanol industry often quotes a 1999 National Research Council study of reformulated gasoline as finding that CO reduction credit should be included for ethanol in EPA?s complex model for RFG because CO tailpipe emissions contribute to ozone formation. But they fail to acknowledge what we believe to be a more important finding. The NRC report stated, ?...the increase in the evaporative emission from the ethanol-containing fuels was significantly larger than the slight benefit obtained from the lowering of the CO exhaust emissions using the ethanol-containing fuel.?[3] The NRC also acknowledged that ethanol increases NOx tailpipe emissions relative to non-ethanol containing fuel. These NOx emissions also contribute to greater ozone and particulate formation.[4] The bottom line: the reduction in CO tailpipe emissions obtained by using ethanol in summertime gasoline do not outweigh the increase in evaporation and the increases in NOx tailpipe emissions from a smog contribution point of view.

Incidentally, the increases in evaporation do not just contribute to ozone formation. Since the gasoline also contains toxic aromatics, such as benzene, these will evaporate more readily along with the ethanol. While ethanol may dilute the amount of benzene in a gallon of gasoline, the amount of benzene that ends up in the ambient air due to increased evaporation from the fuel may be greater than if the ethanol were not added at all.

It is argued that if ethanol is mandated in RFG, air quality is protected because refiners are required to limit the volatility by the RVP limits of EPA?s RFG regulations. Thus, the impact of ethanol on volatility is not a factor. This is not true. First, while it is clear refiners can off-set the volatility effect of ethanol by blending it with super low volatility blend-stock, we do not know what potential air quality benefits may be lost by changing other parameters of the fuel to meet the RVP limit. For instance, a refiner might actually increase aromatics because they need a sulfur-free component that is low in volatility to help offset volatility increases from using ethanol.

RFG with low RVP that contains ethanol will cause increases in evaporation compared to non-ethanol containing RFG in two ways: through increased permeation of ?soft parts? in auto engines and also through co-mingling with ethanol-free fuel.

EPA in its Tier 2 Final Rule identified permeation as a problem that can increase evaporation of gasoline. Essentially, alcohol in fuels promotes the passage of hydrocarbons through the ?soft products? in cars, such as plastic fuel tanks, hoses, and ?o? ring seals. As a result, all new cars subject to Tier 2 evaporative emissions requirements have to demonstrate that they are using materials that resist the permeability effect by testing them with fuel containing 10 % ethanol.[5] But of course this does nothing to protect the vehicles on the road today. Only vehicles being made since approximately 1994 have been consistently using alcohol resistant soft materials. How much will an ethanol-containing RFG meeting RVP limits increase evaporation from vehicles on the road today? Probably a great deal. The Toyota Motor Corporation presented test data to the California Air Resources Board (CARB) that shows a high RVP fuel increased evaporation from gaskets, plastic fuel tubes and plastic gas tank material by 500, 1300, and 800 percent, respectively (See Tabs 1, 2, 3). Even if a fuel meeting RVP limits caused permeation at a half or quarter of the rate of the non-complying fuel tested, this would have a major adverse impact on vehicle evaporative emissions. Toyota has also submitted additional data to CARB that shows new vehicles designed to be “alcohol resistant” may allow increases of evaporative emissions by 10 to 15% when using RFG with ethanol.

Finally, I must note the impact that ethanol volatility can have through a mechanism referred to as ?co-mingling?. Essentially when two fuels with the same RVP, one ethanol free and one containing ethanol, are mixed together the volatility of the entire mix is substantially raised. In a circumstance where consumers purchase ethanol-free fuel, use a portion and then purchase fuel with ethanol in it, even if the ethanol blend is low RVP RFG, volatility can raise as much as 8/10ths of a pound RVP[6]. In essence the adverse volatility effect of ethanol is not limited to the absolute volume sold in a given market area. It can be greatly magnified, depending how much consumers switch back and forth in purchasing the two types of fuels. Whenever the volume of ethanol in the gas tank exceeds 2 percent, the volatility of the entire tank-full of gasoline will be increased. The ?co-mingling? might occur between ethanol containing RFG and conventional fuel among drivers who frequent the areas on the border between non-RFG and RFG areas; among purchasers of ethanol-containing and ethanol-free conventional gasoline in non-attainment areas for ozone.

Aside, from the adverse air quality impacts of mandating ethanol in RFG, we believe that there may also be disruptions in RFG supply with attendant price spikes that will undermine public support for RFG. Although the ethanol industry is going to great pains to demonstrate it can supply all the oxygen needed in RFG across the nation, the simple fact remains that most ethanol is made in the mid-west and would be used in RFG areas thousands of miles away. Because ethanol must be separately transported and stored from RFG until it reaches wholesale or retail outlets, an entirely new infrastructure will be required under an de facto ethanol mandate. It is inevitable that this new

infrastructure will fail at times. Such failures will cause price spikes and calls for the elimination of RFG or broad waivers. Areas that have opted in to RFG may opt out of the RFG program. We may even see a proliferation of more "clean" fuels that simply seek to avoid the ethanol mandate as some areas have sought to avoid MTBE in RFG.

An MTBE Phase Out Must Include Provisions to Prevent "Backsliding" in Toxic Emissions Reductions from RFG

The Blue Ribbon Panel found that the use of MTBE helped refiners achieve a greater reduction in air toxics from RFG than the minimum required by law. Clearly MTBE, if nothing else, dilutes the toxic components of gasoline. We want to be sure that refiners, in complying with the MTBE phase-out, do not substitute toxic components that degrade the air toxics emissions reductions currently achieved. The American Lung Association supports Congress enacting an anti-backsliding provision that locks in these air toxics reduction benefits. Such a provision should be based on the average toxics reduction performance achieved in 2000 and 2001 RFG.

The refining industry argues that the Mobile Source Air Toxics (MSAT) rule issued by EPA under section 202(l) of the Clean Air Act serves this purpose and new legislative requirements are not required. We disagree. The MSAT rule uses outdated years to lock in past performance. Refiners are held to their performance based on an average of 1998,1999, and 2000. However, in the RFG program Phase II of the toxics program did not start until 2000. Phase II initiated additional statutory reduction in air toxics reductions. Refiners outperformed prior years in response to the Phase II mandate. The attached chart demonstrates the difference achieved between 1998,1999 and 2000. On a nationwide basis refiners produced Phase II RFG in 2000 that was 16 percent lower in air toxics than Phase I RFG produced in 1998 and 1999 (See Tab 4,5). We have little reason to believe refiners achieved lower air toxics reductions on average in 2001 than they did in 2000. As a matter of public policy we urge Congress not to take a step backwards by allowing Phase I years to be used as a measure of toxics performance in an anti-backsliding regime.

Second, under the MSAT rule, if an existing refiner of RFG produces additional volumes of RFG above its 1998-2000 levels, those volumes of RFG need only meet the legal minimum for Phase II RFG of 21.5 % reduction from baseline gasoline. We believe this element of the MSAT rule has the potential of significantly degrading air toxics reductions of RFG over time, as the MTBE phase out causes shifts in production among refiners that are very difficult to predict, especially on a regional basis. Any anti-backsliding provision must require that RFG refiners must produce new RFG that meets on average the same average toxic performance that old volumes of RFG must meet.

Ethanol Use in Gasoline and RFG Will Grow

Much discussion has been generated about mandating the use of ethanol in conventional gasoline as a substitute for the demand the ethanol industry expects from the RFG program maintaining a mandatory oxygen requirement. Indeed, the American Lung Association endorsed S. 2962 introduced by Senator Robert Smith in the 106th Congress and reported by the Senate Environment and Public Works Committee containing such a mandate. It is clear that such an approach provides one path for obtaining the necessary political support for phasing out MTBE and eliminating the oxygen mandate in RFG. In the 107th Congress, the Environment and Public Works Committee has reported S. 950 which contains many of the elements the American Lung Association recommends today but does not include an ethanol mandate. Senator Daschle has introduced S. 670, which adopts an ethanol mandate similar to the approach to S. 2962.

The American Lung Association believes there will be a large role for ethanol in gasoline with or without any mandate for one simple reason: **octane.** Assuming that MTBE is eliminated from gasoline, which the ALA supports, refiners face a dramatic shortage in clean octane **even if every MTBE plant in the nation is converted to produce iso-octane or alkylates,** the most logical substitutes for MTBE**.** This is because MTBE plants converted to produce iso-octane or alkylates lose about 30% volume and produce a product that contains 15 percent less octane per gallon. This octane shortage may be increased by EPA?s Tier 2 low-sulfur gasoline standard that will be in full effect in 2006. Refiners

may lose modest amounts of octane in conventional gasoline, as they treat it to reduce sulfur in order to meet the new 30 ppm sulfur average requirement. As a result of these two impacts, a rough calculation indicates that demand for ethanol needed to supply octane in gasoline should increase to **3.8 billion gallons per year** by 2006. (SeeTab 6) This is at least twice the baseline volume of ethanol projected by the Department of Agriculture to be produced in 2006.[7] Should Congress fail to lift the oxygen mandate for RFG so that the entire octane currently provided by MTBE is replaced by ethanol in order to simultaneously meet the oxygen requirement, the demand for ethanol would reach **4.6** billion gallons per year in 2006. Such an outcome would undoubtedly lead to shortages, price spikes, and disruptions that could only lead to reductions in the air quality benefits and loss of public support for the RFG program.

Clearly, we will need large increases of ethanol in gasoline, as we phase out MTBE. From an air quality perspective, it is best to set air quality performance requirements for gasoline and allow refiners to use ethanol when and where they need to while meeting such performance requirements. Such performance requirements must take into account evaporation effects from permeation and co-mingling from dramatically increased use of ethanol in gasoline. Should Congress decide to mandate ethanol in gasoline, we urge that additional air quality protections be put in place that would encourage ethanol use in ways that benefit air quality and not add to the air pollution burden.

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1 U. S. Environmental Protection Agency, Regulatory Impact Analysis, 59 FR 7716, Docket No. A-92-12, 1993

2 Report of the Blue Ribbon Panel on Oxygenates in Gasoline, September 1999, pp. 28-29

3 Ozone-forming Potential of Gasoline, May 1999, p. 158

4 California Environmental Protection Agency Air Resource Board, Air Quality Impacts of the Use of Ethanol in California Reformulated Gasoline, December 1999

5 See Discussion at 64 Federal Register, 26084, May 13, 1999

6 In-use Volatility Impact of Co-mingling Ethanol and Non-ethanol Fuels, SAE 940765, February 1, 1994

7 U. S. Department of Agriculture, Economic Analysis of Replacing MTBE with Ethanol in the United States, March, 2000

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