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Congress of the United States
House of Representatives
Committee on Government Reform
Subcommittee on Energy Policy, Natural Resources and Regulatory Affairs
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**Prepared Witness Testimony of
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California Energy Commission**

Transition from Methyl Tertiary-Butyl Ether to Ethanol in California

Mr. Chairman and members of the Committee:

I welcome the opportunity to discuss California's efforts to replace methyl tertiary-butyl ether (MTBE) with ethanol and what impacts this transition has had on gasoline supplies and prices during the first six months of this year. Beginning January 1, 2004, California will no longer permit the use of MTBE in gasoline. Today, I would like to provide an update on where we are with eliminating MTBE, and explain the causes behind the recent increases in gasoline prices throughout the state.

Overall, the transition to MTBE-free gasoline is proceeding well. About 70 percent of California's gasoline is currently blended with ethanol. Valero, Tesoro and Chevron-Texaco's northern California facility will complete their conversions in the fall. At the same time, modifications to pipelines and most terminals where ethanol is blended with gasoline are complete or will be shortly.

MTBE Phaseout and Reduced Gasoline Production

When refiners discontinue the use of MTBE and switch to ethanol, the volume of reformulated gasoline production is impacted. This occurs for two reasons: first, because MTBE is used at a concentration of 11 percent by volume, while ethanol is currently being used at a concentration of 6 percent by volume; second, when refiners begin to produce summer grade gasoline, additional blending components must be removed before ethanol can be mixed with the gasoline. This ensures that the final blend complies with distillation temperature, volatility limits and other California reformulated gasoline specifications. This means another 5 percent of gasoline production capability is reduced. Without refiners taking other actions, California's total gasoline production capability would be reduced by nearly 10 percent, equivalent to the output from one large refinery. Given concerns about the volumetric loss of gasoline production capacity and the readiness of California's logistical system to deal with these changes, in March of 2002, Governor Davis chose to delay the phaseout date by one year; from January 1, 2003 to January 1, 2004.

Some refiners responded by making modifications to their refineries to slightly increase production of blending components from their alkylation units, while others increased imports of blending components, and another refiner converted some conventional gasoline to reformulated gasoline for use in California. Coupled with the fact that some refiners decided to adhere to the new phaseout date, the total decrease in gasoline production capacity is now estimated to be in the range of 1 to 2 percent or 10 to 20 thousand barrels per day for the summer of 2003.

Gasoline Demand and Supply

Gasoline demand in California during 2003 is estimated to range between 15.6 billion to 16 billion gallons and expected to continue to grow at 1.6 percent to 3.0 percent annually through 2010. California motorists represent about 11 percent of the United State's total gasoline demand. At the same time, refinery modifications may only allow production to expand by one half of one percent annually.

In-state refiners and marketers of gasoline will be making up the bulk of the net production loss through increased imports of gasoline and gasoline blending components. In the near term, the combined impact of reduced gasoline production and increased gasoline demand will boost imports by 26 to 80 thousand barrels per day.

Ethanol Supplies, Costs and Impacts on Gasoline Prices

Earlier concerns about the adequacy of ethanol supplies have diminished as the ethanol production industry has added significant capacity to meet California's annual demand of 565 to 660 million gallons of ethanol.

The early transition away from MTBE by most of the refiners in California necessitated the use of ethanol because the federal Environmental Protection Agency did not grant California a waiver from the minimum oxygen requirement. Ethanol is the only type of oxygenate that can be used in California. The use of ethanol was not a primary cause of the price spike in early 2003. There were no shortages of ethanol supplies nor were there any verified difficulties in blending the new type of gasoline, such that supplies of gasoline were directly impacted. In addition, the price of ethanol that was being purchased by refiners under 6 and 12-month contracts was structured so that the net cost of the ethanol was usually less than that of the gasoline. Therefore, ethanol costs were not likely a contributing factor to the price spike in early 2003.

The use of ethanol has a greater potential to impact gasoline prices in the summer (compared to winter) due to the affect on refinery production capability. This impact on production capability occurs for two reasons. The first reason is related to the phaseout of MTBE. The second reason is related to the changes necessary to blend ethanol during the summer season (which lasts 8 months in California). As noted earlier, the transition away from MTBE decreases refinery production.

Moreover, the use of ethanol during the summer period necessitates other operational changes by refiners to ensure that the gasoline blended with the ethanol will comply with all of the specifications, especially the volatility limit of 7.2 PSI for summer grades of gasoline. Since ethanol is more volatile than MTBE, refiners have to adjust gasoline blending practices by withholding other components (such as pentanes). This means that gasoline production declines another 5 percent, absent any other changes by refiners such as expanded alkylate production, increased imports of blending components, or conversion of conventional gasoline output to reformulated gasoline output.

Additionally, the increased difficulty to produce California gasoline for blending with ethanol during the summer months reduces the number of potential suppliers of this type of gasoline formulation. In other words, the number of refiners outside of California who can produce gasoline of this quality declines during the summer months, reducing the potential for imports. At the same time, the need for imports increases during the summer months because of the slight decline in refinery production and the increased demand for gasoline that is typical during the summer driving season. This is another factor that can increase the cost of gasoline for consumers during the summer versus winter months that is directly due the use of ethanol.

Logistical Issues and Impact on Unbranded Market

However, the MTBE phaseout did result in new supply and logistics arrangements for some refiners. As a result, primary suppliers struggled to maintain consistently adequate supplies of gasoline to these customers. This appears to have contributed to a rapid price increase for unbranded gasoline in both Northern and Southern California. One of these logistical changes was the increased need to transport gasoline from Northern to Southern California. This shift resulted in temporary runouts at one of the terminals in Southern California as suppliers struggled to increase the deliveries at a greater rate than the wharf and pipelines could handle. In some circumstances, supplies of gasoline were also delayed in arriving in Southern California due to a lack of an adequate number of marine barges. The barge situation has since been improved, but the import infrastructure is still vulnerable to intermittent supply disruptions because of the capacity constraints.

Another logistical problem related to the switch to ethanol occurred in Northern California. Since some of the refiners decided to transition away from MTBE at an earlier date than required, there was an additional need to keep these different types of gasoline separate from one another to maintain quality. This segregation need caused some marketers to switch terminal locations, constraining the ability of the new terminal location to handle increased demand for gasoline deliveries. Temporary supply disruptions and associated price increases resulted. Modifications have since been completed to some pumps and valves to accommodate additional throughput.

The Causes for Increased Gasoline Prices in California

A variety of factors contributed to the March 17th spike in California retail gasoline prices.

1. The primary cause of high California gasoline prices was the sharp rise in world crude oil prices in anticipation of the recent war in Iraq. The impact on gasoline prices of high oil prices was common to gasoline prices throughout the U.S.
2. Second, a variety refinery maintenance problems caused California retail prices to rise well above their typical differential relative to the average U.S. price. These refinery problems coincided with the early March changeover to low Reid vapor pressure (RVP) summer gasoline, but had nothing directly to do with the phaseout of MTBE.
3. Finally, the process of making low RVP blendstock was a new experience for California refiners this spring. After rumors of some bad pipeline batches just prior to the shipping deadline, the price for prompt delivery increased markedly. Even though the changeover to summer gasoline went very smoothly overall, and no bad batches were actually shipped, uncertainty in the marketplace around the new gasoline specification also contributed to higher prices this spring.

Since the March 17th peak of \$2.15 per gallon, all California refineries were back to full operation by mid-April, and retail gasoline prices declined in a manner consistent with retail prices throughout the U.S.

In early June, however, a new round of minor refinery problems among three Northern California refineries combined to cause a significant impact to in-state production. As a result, retail gasoline prices in California reversed a 12-week decline on June 9th, climbing from \$1.70 to \$1.80 per gallon as of June 23rd.

The early phaseout of MTBE by a majority of California's refiners did result in some logistical problems earlier this spring, but it appears that industry managed to avoid similar problems during the more recent round of refinery problems in June. Although the refineries impacted by the most recent outages still produce MTBE gasoline primarily, they were successfully able to purchase ethanol gasoline blendstocks and re-blend them into MTBE gasoline. As a result, the recent price increases were distributed evenly between ethanol gasoline and MTBE gasoline.

Overall, the shift from MTBE to ethanol in California reformulated gasoline does not appear to have contributed directly to the recent high gasoline prices.

Outlook for Ethanol-Related Gasoline Price Spikes in 2004

It would be speculation to offer an opinion on whether or not price spikes will occur in 2004 and whether or not these possible spikes would be related to ethanol. Rather, the Energy Commission can discuss anticipated operational changes and other factors that could have a potential impact on supply and prices. First, the rest of the refiners in California are expected to transition away from MTBE by the end of this year. Second, the phaseout of MTBE in New York and Connecticut (scheduled to take effect by January of 2004) could increase costs for California due to more expensive ethanol and

gasoline blending components. Ethanol demand will increase if these states transition away from MTBE as scheduled. Increased demand can lead to upward pressure on national ethanol prices. Gasoline production capability is also expected to decline slightly during the summer months for reasons previously stated. But this decline is not expected to be as great as the one for California because ethanol is anticipated to be blended at a higher concentration (10 versus the 6 percent in California). If marketers blend at a lower concentration than anticipated, the potential loss of production could be greater. In either case, the need for key blending component (such as alkylate) will increase as refiners search for a replacement for the MTBE that can no longer be used in gasoline that is manufactured for use in New York and Connecticut. California refiners will also be competing to acquire additional quantities of alkylates. This increased competition can lead to upward pressure on alkylate prices, negatively impacting gasoline prices in California.

Remaining Challenges after Phaseout of MTBE

Growing demand for gasoline and anticipated production declines will increase the need to import gasoline and clean blending components. Import infrastructure for receiving these products must be sufficient to accommodate increased import volumes, most of which are likely to arrive at ports in the Bay area, Los Angeles and Long Beach.

A recent study conducted for the California Energy Commission concluded that the marine petroleum infrastructure in California's main refining centers is significantly constrained. The wharves, storage tanks linked to the berths and gathering lines used to gain access to the petroleum pipeline system for moving products inland pose areas for concern with the growing demand for imports.

The result is an additional need for imported gasoline to ensure adequate supplies for California consumers. Other market participants, such as traders, are playing an increasingly important role with regard to gasoline imports. But it is important to note that the import infrastructure used by these market participants is usually more constrained than the infrastructure operated by the major oil refiners (third party versus proprietary storage). Each of these issues has been raised during the course of recent workshops held by the Energy Commission. In fact, a workshop is scheduled for July 11 to address, among other issues, the marine infrastructure constraints and potential recommendations to help alleviate the current and near-term congestion.

The Energy Commission and California Air Resources Board are also addressing the longer-term impacts of petroleum dependence on the California economy and environment. Consumer demand for clean, low-carbon, and affordable transportation fuels is expected to intensify, as California and the nation adapt to the growing pressures of population growth, demand for transportation services, increases in worldwide oil demand, and climate change. State actions to increase fuel efficiency and ease the transition to non-petroleum fuels are being recommended to "hedge" against the risk of continuing oil dependence. The best strategy would be for the Federal government to

increase CAFÉ standards that would result in a doubling of fuel efficiency for new cars, light duty trucks and sport utility vehicles.