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**GASOLINE REFINING AND THE CLEAN  
AIR ACT AMENDMENTS OF 1990**

Statement by

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before the Committee on Energy  
and Natural Resources

U.S. Senate

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Mr. Chairman, I appreciate being invited by the Senate Committee on Energy and Natural Resources to testify on the impact of the Clean Air Act of 1990 on the U.S. refining industry.

The Clean Air Act Amendments of 1990 have been accepted as a fact of life by the U.S. refining industry. There is general agreement that the Amendments will achieve their purpose to make oil products more environment friendly. However there is still much debate on whether the path prescribed in the Act and laid out by the EPA was the best, the most effective and, above all, the least-cost route to achieve these results. Many refiners, as well as independent experts, believe that the industry might have been able to attain the same results at a lower cost if the 1990 CAA had fixed only the goals but had left the implementation to the industry. The existing regulatory path also does not make allowances for innovations. Yet, the industry's obligatory concern with emission control from burning oil products is still new enough to expect innovations and improvements. One example is the recent findings by a joint automobile and oil industry research project that a reduction in the sulfur content of gasoline can bring about a sharper reduction, probably at a lower cost, in automotive exhaust emissions than the mandated minimum oxygenate additions and the mandated reformulated gasoline program starting in January 1995. However, under existing legislation sulfur removal is not recognized as a substitute for either of these two requirements.

Similarly, the reduction in automotive air pollution through stricter inspections and maintenance programs and the removal of old high-polluting cars through purchases for scrappage has not been considered as an alternative to the mandatory use of reformulated gasoline in the 36 ozone non-attainment areas from 1995 on, accounting for about 1/3 of U.S. gasoline consumption. True, the EPA has recently recognized the value of reducing automotive air pollution through the removal of "clunkers" and is working on a plan to include these vehicles in its system of emission trading. But by the time this could have a measurable impact on air pollution the refineries supplying these areas will have had to make the investment to produce reformulated gasoline under the deadlines set forth in the legislation.

Next, there is the issue of "opting-in" by states and/or regions classified as "non-attainment" but not of a degree which requires the move to reformulated gasoline under CAA standards. The term "opting-in" has a positive appeal in this connection, environmentally as well as politically. It means moving to a less polluting gasoline in an area where pollution exceeds the federal standards. Who can be against that? Eventually, even the oil industry may prefer a single type gasoline to a dual type in adjacent and sometimes even overlapping market areas. But there is of course another side to this: the enormous capital cost to the U.S. refining industry, most of it crowded into the next 4-6 years, plus a substantial increase in operating costs.

This raises the question whether opting-in is economically justifiable on a cost/benefit basis. It is important to realize the vast range of exceedances included in the CAA's non-attainment definition. It goes all the way from Los Angeles, which in the year 1990 had 104 non-attainment days, to a city or area with a total of 0 or 1 non-attainment day in 1990 and possibly below EPA's standard but still classified as non-attainment in the 3-year designation period. Of the 36 non-attainment areas which will go to reformulated gasoline in 1995 only the 9 classified as "extreme" or "severe" are mandated by the CAA.

The opt-in provisions have created much uncertainty for U.S. refineries. If there is no further opting-in about 35% of total U.S. gasoline demand may require the reformulated variety by 2000. If there is maximum permissible opting-in, it could be 65-70%. Estimates of the capital cost vary, of course, substantially but according to some industry estimates the capital requirements to meet all the mandated environmental regulations is likely to be on the order of \$35-40 billion in the 1990's. This is in addition to the refining industry's other investments which in the 1980's amounted to \$40 billion, including a much smaller share for environmental needs.

The burden of this investment will weigh heavily on all U.S. refiners because it coincides with a levelling off and subsequent decline of the industry's principal and most profitable product, gasoline. The reasons are: (1) significantly higher prices brought about by the CAA investment requirements; (2) continuing increase in the fuel efficiency of motor vehicles, particularly since CAFE standards for new vehicles are likely to be further improved in the next few years; and (3) the slow, but apparently determined move to alternate fuels for motor vehicles. The mandated use of oxygenates partially falls into this last category for refiners (but not for gasoline consumers).

The inevitable result of these developments, i.e., rising capital requirements and falling gasoline demand, will be the closing of some U.S. refineries and the consolidation of plants and companies. The most endangered species are the small refineries, both those operated by large companies and those which often represent the only assets of the small companies. The most assured survivors are the 25 largest oil companies whose refining capacity ranges from 150 MB/D to 1.5 MMB/D and which together account for over 80% of total U.S. refining capacity. The small plants of the large companies are likely to be the first ones to be closed if their gasoline quality has to be changed, since these companies will want to concentrate their investments on the big plants where there is economy of scale. Many of the 100 or more small refineries will, of course, also survive, either because they supply niche markets or because they operate in areas exempted from the required quality changes in gasoline or because they will consolidate their operations with those of other small plants in the same market.

It is noteworthy in this connection that a recent attempt by Conoco and Total to meet their CAA investment obligations by jointly operating their 50,000 B/D and 28,000 B/D plants in the Denver area was blocked because of conditions imposed by the Federal Trade Commission. The FTC's action has caused concern among some of the small refining

companies. It seems to me that whatever the FTC's rationale, if its ruling should cause the two refineries, or even one of them, to close, the competitive situation in Denver is likely to be worse than if they had been permitted to consolidate.

Overall, the restructuring and other changes brought about by the CAA and the accompanying EPA regulations should not impair the competitiveness of the U.S. refining industry. There will still be many more companies operating in the U.S. market than in any other industrial country and the concentration ratio will still be lower than for many other major U.S. industries. The damage will be at the local level in the form of unemployment, loss of revenue, etc.

Perhaps a delay or postponement of the opting-in process would make it easier for the refining industry to digest these momentous changes and enable some of the small plants to operate longer. It would also reduce the likelihood of investment decisions based on scientific errors or excessive costs. In this connection, I would like to call attention again to the efficiency and speed of improving air quality by removing old vehicles. The EPA itself has recently stated that "the dirtiest six percent of the cars on the road emit 50% of total (automotive) hydrocarbons."

In evaluating the idea of postponing further opt-ins it should also be acknowledged that much progress in reducing automotive air pollution has already been made. Pollution emission per vehicle in 1990 was 40% lower than in 1980. Total pollution emissions from all vehicles dropped by over 25% during the same period despite a 40% increase in total vehicle miles travelled. So, the still prevailing image of a gas guzzling public increasingly polluting our environment is becoming invalid in much of the country. Hence, in many areas which have not yet opted-in the environmental benefits of doing so may be too marginal to justify the cost which initially must be borne primarily by the fuels producers in the form of capital investments. Furthermore, given the trend I have described, it is quite possible that some non-attainment areas currently classified as "moderate" or "marginal" may qualify as attainment areas in the foreseeable future. Any investments made to supply these markets with reformulated gasoline could then become obsolete.

One final point: Will the U.S. refining industry continue to be able to supply all the major light products -- gasoline, middle distillate and jet fuel -- needed in the U.S.? This depends of course on the degree of refinery closings and consolidations discussed above. Under our assumptions, the industry will likely be able to supply all gasoline requirements because we expect gasoline demand to be flat or downward from the mid-1990's on. But the refining industry's spare capacity in gasoline making will be even lower than now. We can therefore expect an increase in imports of blendstocks and other unfinished products to be turned into finished gasoline in U.S. refineries. Incremental demand of mandated oxygenate requirements will also have to be met from imports.

Unlike gasoline, middle distillates and jet fuel, are growth products. The DOE in its latest Reference Case Forecast projects a 13% and 14% growth, respectively, in jet fuel and middle distillate demand from 1990 to 2000, with continued growth in the following decade. Much of this growth will probably have to be met through imports as a consequence of the CAA induced industry restructuring.