Written Statement of the
National Petrochemical & Refiners Association

Delivered by
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United States Senate Energy and Natural Resources Committee

On

"Why Diesel Prices Are So High and What Can Be Done to Address The Situation"

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I. INTRODUCTION

Chairman Bingaman, Ranking Member Domenici, and members of the committee, I am Greg Scott, Executive Vice President and General Counsel of NPRA, the National Petrochemical and Refiners Association. NPRA is a national trade association with nearly 500 members, including those who own or operate virtually all U.S. refining capacity, as well as most of the nation's petrochemical manufacturers who supply "building block" chemicals necessary to produce products ranging from pharmaceuticals to fertilizer to Kevlar. I am grateful for the opportunity to share our views on why diesel prices have been so high, and what can be done to address the situation.

There are a number of factors that contribute to the current high price of diesel. First and foremost is the high price of the crude oil from which diesel fuel is derived. Second, like gasoline, diesel is a commodity product and therefore susceptible to the basic economic rules of supply and demand. Domestic and global demand for diesel remains very high and, unlike gasoline, diesel demand has not moderated in the face of increased prices. Third, despite continued past and current domestic refinery expansions, current U.S. refining capacity continues to struggle to meet high domestic demand for the full range of petroleum products. Finally, the U.S. refinery industry has made significant investments over the past decade to successfully implement the first portions of the Environmental Protection Agency's Ultra Low Sulfur Diesel, or ULSD, program. While the ULSD Program has resulted in significant reductions in the sulfur levels in highway diesel fuel, ULSD is both more expensive to make and results in the diversion of some higher sulfur distillate fractions – fractions that in the past were used to make highway diesel fuel – into other fuel streams such as off-road diesel fuel and home heating oil.

I will address each of these factors in more detail below and then provide NPRA's views on what can be done to address the situation.

II. BACKGROUND -- REFINING 101

It may be helpful for members of the Committee to have some basic background on the chemistry and mechanics of oil refining. Such a framework will make it easier to answer the questions posed by this hearing.

No two refineries are identical. The choice of processes and refinery equipment is based on crude oil type, product demand, and product quality requirements. Refineries process crude oil to produce many different types of petroleum products. Besides gasoline and diesel fuel, refineries also produce jet fuel, residual fuel oil, asphalt, lubricants, petrochemical feedstocks (i.e., ethylene, propane, propylene, naphtha, and gas oil), and other miscellaneous products. Crude oil, the basic feedstock, is not a homogenous substance. It varies widely in color, gravity, viscosity, sulfur content, metals content and other characteristics. There are hundreds of crude oils available throughout the world. Crude oil types include sweet (low sulfur), sour (high sulfur), heavy (high specific gravity), light (low specific gravity), paraffinic, naphthenic, and intermediate (somewhere in between paraffinic- and naphthenic-type).

A refinery is really nothing more than a complex, large-scale chemistry set with four basic processes: distillation, hydrocleaning, cracking, and blending. Refining separates the many compounds present in crude oil by boiling it at different temperatures. The chemistry of hydrocarbons is the principle used in this process – the longer the carbon chain, the higher the temperature at which the compounds will boil. Generally, crude oil is heated and changed into a gas. The hot gases are passed into the bottom of a distillation column and become cooler as they move up the height of the column. As the gases cool below their boiling point, they condense into a liquid. The liquids are then drawn off the distilling column at specific heights, ranging from heavy residues at the bottom, raw diesel fuels in the mid-sections, and raw gasoline at the top. These raw fractions are then processed further to make several different finished products.

The simplest refineries consist of crude and vacuum distillation, reforming and some hydrotreating capacity. The next level of complexity adds catalytic cracking and some additional hydrotreating. The most complex refineries include coking, more hydrotreating and hydrocracking. Additional processes yield the petrochemicals that serve as the building blocks for everything from cleaning agents to cosmetics, clothing, medicines and plastics.

Gasoline is the largest volume petroleum product manufactured by our nation's domestic refineries (8.4 million barrels/day in 2007), accounting for nearly half of U.S. petroleum product production. Distillate fuel oil (which includes highway and off-road diesel plus home heating oil) accounts for the second largest petroleum product (4.1 million b/d at U.S. refineries in 2007). EPA reports that diesel fuel oil is produced at 136 continental U.S. refineries.[1]

Diesel fuel is a mixture of hydrocarbons for use as a heavy-duty truck (compression ignition engine) fuel. Key properties include aromatics content, cetane number/index, distillation temperatures, and sulfur content. To be used in the United States, diesel fuel must meet both EPA and ASTM specifications (ASTM D-975 (Standard Specification for Diesel Fuel Oils) and 40 CFR Part 80 and 40 CFR Section 69.51). Distillate fuel oil is produced from hydrocarbons that are heavier than gasoline and lighter than lubricants. Therefore, a large fraction of a barrel of crude oil does not contain hydrocarbons that are suitable as components of distillate fuel oil. Simply put, a barrel of crude cannot be used to make only gasoline or diesel, but instead makes a variety of petroleum products.

It is important to understand this last point. A barrel of crude oil is 42 gallons. From a barrel of crude, a "typical" domestic refinery can produce approximately **10** gallons of diesel fuel, 20 gallons of gasoline, 4 gallons of jet fuel, and 6 gallons of other products, including LPG, fuel oil, lubricants, coke and asphalt.[2] The precise volume of each product derived from a barrel of crude depends on many factors, including the chemical characteristics of the crude, the technology available at the

[1] "Summary and Analysis of the 2008 Nonroad Diesel Fuel Pre-compliance Reports," EPA420-R-08-017, September 2008 , page 4. http://www.epa.gov/otaq/highway-diesel/compliance/420r08017.pdf

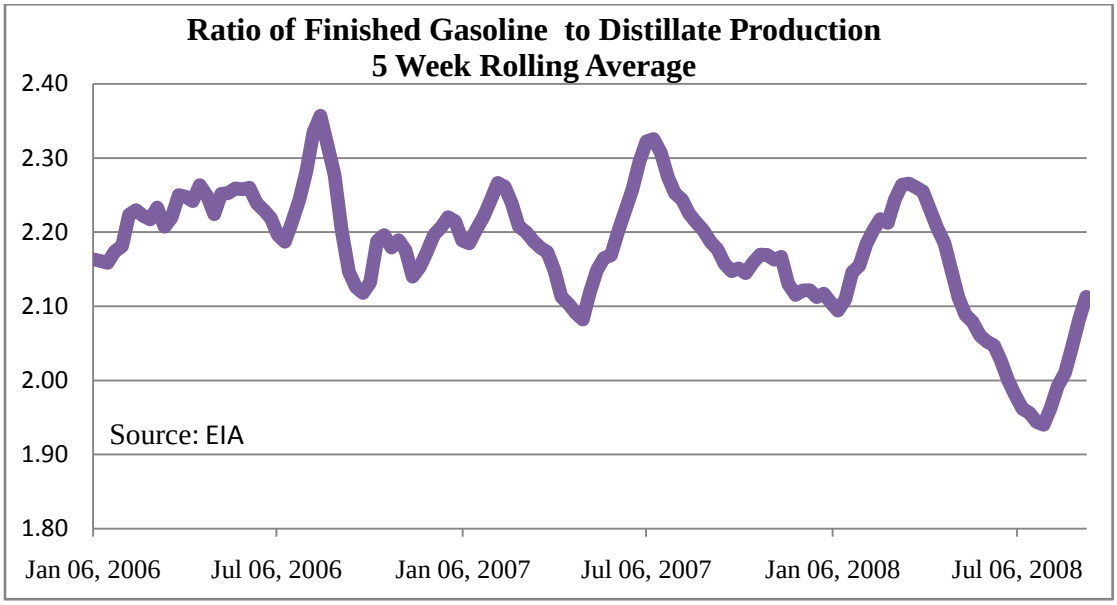
[2] The sum of these products is not 42 gallons because a portion of crude oil is consumed as fuel in the refining process.

individual refinery to distill and process the crude's fractions, market demands, and the regulatory standards a fuel must meet.

Thus, while most refineries have some flexibility to alter their production from a single barrel of crude oil between gasoline, diesel fuel and other petroleum products, this flexibility is very limited and is constrained by the basic chemistry of petroleum products, the equipment at the individual refinery, and the technologies of the engines in which these products are to be used. For example, if the markets are signaling that diesel fuel is in high demand, some refineries might be able, to a modest degree, to increase diesel fuel production and reduce gasoline production. The "typical" numbers above (20 gallons of gasoline and 10 gallons of diesel from a barrel of crude) may be altered to introduce a diesel fuel bias (19 gallons of gasoline and 11 gallons of diesel from a barrel of crude). However, there is a limit to this bias that cannot be exceeded due to the equipment available at each refinery.

Domestic petroleum refiners move between a "gasoline-bias" and a "diesel-bias" throughout an average year, on average maximizing gasoline production in the Spring of each year (in anticipation of the summer driving season and high gasoline demand) and maximizing diesel production in the fall of each year (in anticipation of the home heating oil season and high distillate demand). As depicted on Chart #1, the ratio of gasoline production, divided by diesel production, has steadily declined for the past two and one half years. A declining ratio translates into greater diesel fuel production.

CHART #1



Similarly, there are seasonal swings in inventories: the days of supply of distillate fuel oil ranges from 25-35 days, at the low end at the beginning of summer and at the high end at the beginning of winter. EIA reports that the national days of supply for distillate fuel oil was 32.1 days on September 12, 2008 and was 32.8 on September 14, 2007.[3] These inventories are at the high end of the historical inventory band, indicating that there is not a distillate fuel oil supply shortage at the present time.

In addition, EIA reports that the days of supply of gasoline ranges from 21-26 days, at the low end during the winter and at the high end at the beginning of summer in order to accommodate the transition from winter to summer gasoline specifications. The national days of supply for gasoline was 20.1 days on September 12, 2008 and was 20.2 on September 14, 2007.[4]

Recently, statistics have been reported that indicate that our nation's domestic refining industry is not operating at full capacity. Those statistics do not reflect the full story. First, some refineries have been out of service for repairs, environmental upgrades, maintenance ("turnarounds") and

[3] http://tonto.eia.doe.gov/oog/info/twip/twip_distillate.html
[4] http://tonto.eia.doe.gov/oog/info/twip/twip_gasoline.html

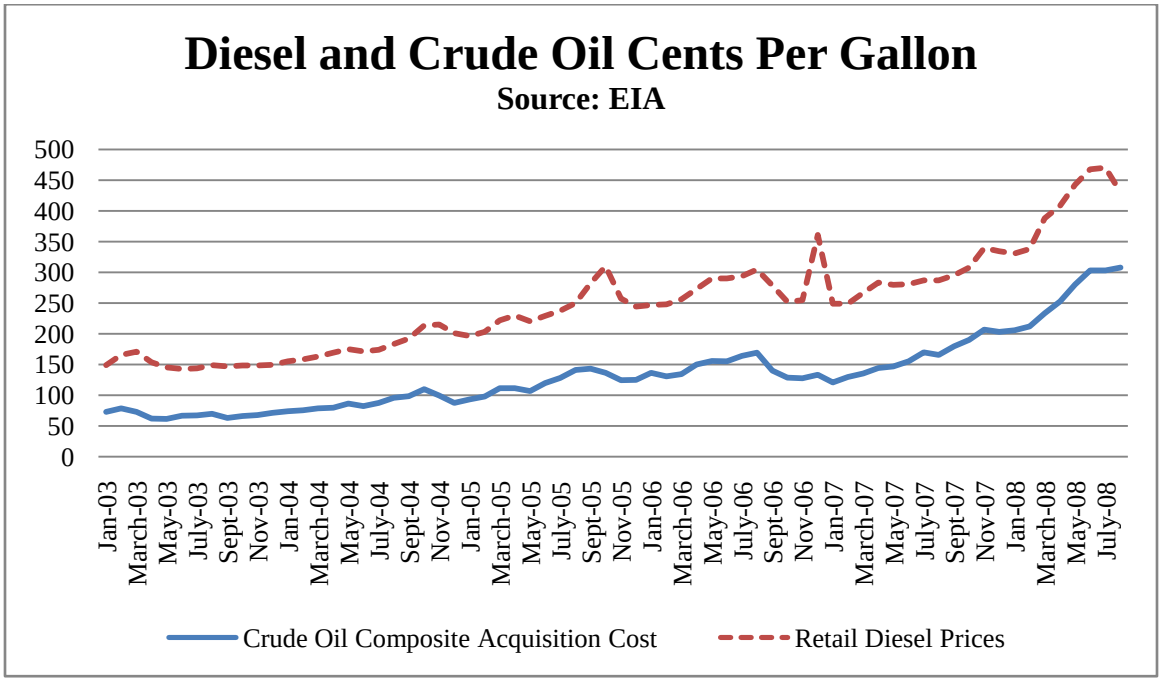
expansion. Second, over the past month, the operations of several dozen refineries along the Gulf Coast have been impacted negatively by Hurricanes Gustav and Ike and are either just getting back to normal operations or are in start-up mode. Finally, as the inventory statistics above indicate, there is no shortage of gasoline or diesel fuel in the United States. Thus, as long as inventories are strong, the markets are signaling to domestic refiners that current supplies are adequate for current demand. Any significant increase in domestic production simply is not necessary to maintain adequate supplies of gasoline and diesel fuel.

Based on this background on petroleum refining and diesel fuel production and supply, I will now address the factors contributing to high diesel fuel prices.

III. HIGH CRUDE OIL PRICES

As noted above, crude oil is the fundamental feedstock for diesel fuel. As Chart #2 indicates, crude oil prices (the solid line in the chart) have increased significantly over the past five years. This chart also tracks (the dashed line in the chart) the price of highway diesel fuel over this same time period. As you can see, the price of highway diesel fuel closely tracks the price of crude oil with some slight variations due to supply and demand issues.

CHART #2



This correlation should not be surprising to the Committee. According to the EIA, the cost of crude oil makes up 64 percent of the cost of a gallon of diesel fuel. Refining, transportation and retail costs comprise another 25 percent, and federal and state taxes are the remaining 11 percent of the price of a gallon of diesel fuel in August 2008.[5]

Thus, as long as crude oil prices remain high, it would be difficult to anticipate significant reductions in diesel fuel prices. Crude oil prices have come some down off their summer highs of over $140.00 per barrel. If this trend in crude pricing continues and past experience provides us with any guide to the markets' future behavior, moderating crude oil prices should moderate upward pressures on diesel fuel prices. However, additional factors are at play in the markets that may cause a departure from past experience.

IV. HIGH GLOBAL DEMAND FOR DIESEL AND DIESEL SUPPLY

As I am sure other witnesses before this Committee will relate, many consider diesel fuel to be the "fuel of the future" and are making significant investments to develop and product diesel-powered

[5] http://tonto.eia.doe.gov/oog/info/gdu/gasdiesel.asp

highway vehicles in record numbers. In other parts of the world, this trend towards diesel-powered vehicles and away from gasoline-powered vehicles is already well underway and will accelerate in the coming years.

Over the past two decades, Europe has transformed into an economy that powers its vehicles on diesel fuel. Diesel's share of new vehicle sales has exceeded 50 percent annually for the last several years. Europe's strong shift from gasoline to diesel has created supply challenges for itself and its imports of diesel are growing.

As diesel fuel demand across the world and in the United States increases, this demand has shown little elasticity in the face of higher crude oil and petroleum product pricing. While higher crude oil prices and the resulting higher gasoline prices have led to reductions in domestic gasoline demand, according to EIA, such demand reductions for diesel have not occurred to date. This may be due to the fact that substantial amounts of diesel consumption is non-discretionary (a school bus must still drive its route; a commercial truck must still deliver its goods). Conversely, some gasoline consumption appears to be discretionary, as both overall petroleum consumption and gasoline consumption has declined, month-over-month, in each of the last 12 months, according to EIA.

Domestic (and world-wide) refining capacity for gasoline and diesel fuel is increasing to respond to this increased demand. Today, there are 150 U.S. refineries, owned by 60 companies, with aggregate crude oil processing capacity of 17.6 million barrels per calendar day (as of January 1, 2008) as compared to 15.2 million b/d on January 1, 1996.[6] And these refineries are getting larger and more complex. In 1981, the average refinery in the United States had approximately 57,000 b/d of crude oil distillation capacity. Today, the average refinery has a capacity of over 110,000 b/d. This growth is equivalent to building a new refinery every year for 12 consecutive years.

[6] http://www.eia.doe.gov/emeu/aer/pdf/pages/sec5_21.pdf

Despite these increases in domestic refining capacity over the past decade, the United States continues to struggle to meet domestic gasoline and diesel fuel demand. The U.S. is a net importer of gasoline and a net exporter of distillate fuel oil.[7] Although precise statistics are not available as to the specifications of the distillates being exported, it is likely that the distillates exported from the U.S. are higher sulfur diesel fuels, which is not in demand in this country due to the ULSD program. These higher sulfur fuels continue to command higher prices due to significant demand overseas. As a result, most distillate exports are designed to serve these demands.

V. DIESEL PRODUCT COSTS HAVE INCREASED, AND HIGHWAY DIESEL CAPACITY HAS REMAINED STATIC, DUE TO ULSD PROGRAM

The Environmental Protection Agency (EPA or Agency) has required significant reductions in the sulfur content of diesel fuel. The Agency issued rules in 2001 to reduce the sulfur content in highway diesel fuel by 97% by June 2006 and standards in 2004 to reduce the sulfur content in nonroad diesel by 75% by June 2007 and by 99% by June 2010.

These regulations required the installation of new, or increased capacity (e.g., expanding the reactor volume) process equipment (*i.e.,* distillate hydrotreater) to remove the sulfur compounds in distillate fuel oil-compatible streams. This equipment also results in higher operating costs because of the hydrogen and catalysts required for this equipment. For example, the sulfur in crude oil may be 5,000 – 20,000 parts per million (ppm); so a considerable amount of sulfur reduction is required to meet EPA regulations at a cap of 15 ppm. EPA's standard can be technically met, but at a high cost. U.S. refiners have spent billions of dollars on these units. There has been considerable activity

[7] Exports of distillate fuel oil in May and June 2008 were 444,000 and 654,000 b/d,[7] respectively (by comparison, exports of distillate fuel oil in 2007 averaged 240,000 b/d and imports were 301,000 b/d). Distillate fuel oil in May and June 2008 was shipped from the U.S. to more than 20 countries, primarily in South America and Europe. Imports of distillate fuel oil in May and June 2008 were 188,000 and 179,000 b/d, respectively. The U.S. is a net exporter of distillate fuel in response to increasing, strong global demand and adequate U.S. supplies. This tight global supply-demand balance may result in a continuation of the recent role for the U.S. as a net exporter of distillate fuel oil (in 2007 and earlier years, the U.S. was a net importer of distillate fuel oil).

securing permits, ordering and installing equipment, unit commissioning, and integrating the equipment at the refinery.

There are several different types of sulfur compounds in these streams and some are harder to remove than others. There is also variability depending on the type of crude oil and processing before the stream is desulfurized. In addition, this desulfurization step must be accomplished while ensuring that other key properties are on-spec (i.e., density, cloud point, and distillation temperatures).

VI. IMPACT OF HURRICANES ON DOMESTIC REFINING

Hurricane Gustav made landfall in Louisiana on September 1 and Hurricane Ike made landfall in Texas on September 15. These events were obviously disruptive to people, businesses and property. Ports, refineries, pipelines and offshore oil and gas platforms were closed. After the passage of these hurricanes, damage was assessed and facilities came back as power was available and safety concerns were considered. Some refineries are restarting production at reduced rates. Others have damage to repair before they are available to restore operations.

Many refineries in the Houston/Galveston area are still shut down or in restart mode. Four refineries in the Port Arthur, Texas area are still shut down. In the Houston/Galveston area, five refineries are still shut down and four are restarting. NPRA does not have an estimate of when all of these affected refineries will return to full operation.

The U.S. Department of Energy has expeditiously delivered emergency exchange crude oil from the Strategic Petroleum Reserve to refineries in response to disruptions caused by both hurricanes. The exchange agreement includes return of the principal amount of similar quality crude oil to the SPR, plus payment of an in-kind negotiated premium. This is an appropriate use of this resource.

VII. RECOMMENDATIONS

NPRA has several recommendations for this Committee concerning steps that can be taken to address current high diesel fuel prices. Unfortunately, in the short term, there is little that can be done in the public policy arena to immediately impact diesel fuel supplies and prices. However, if we collectively look to the future, there are strategies that can be pursued to address these issues in the years ahead.

First, a general recommendation. At a time when diesel prices are high, despite adequate supplies of diesel, refineries need more -- not less -- legislative and regulatory certainty to make reliable project feasibility analyses and to drive future investment opportunities. If Congress fails to fully consider the fuel supply impacts of legislation and implementing regulations, then this situation will not improve. Refiners support and encourage continued environmental progress. However, if policymakers have tended to overlook and take for granted the supply side of the environmental-energy equation, then we are destined for more of the same. It is imperative, in our opinion, that determining the impact on supply must be fully embedded in the policy-making process. In working with policymakers on improvements to fuels and facilities, NPRA has often commented that industry needs time, flexibility or more realistic standards to minimize negative impacts on fuel supply. Policymakers, however, often opt to promulgate regulations that are "technology forcing," constructed with limited and often theoretical "margins of safety," and requiring implementation in the shortest time possible — all without adequate attention to fuel supply impacts. Congress should make increasing the nation's supply of oil, oil products and natural gas a number one public policy priority.

Let me apply this general recommendation to several specific legislative initiatives currently under consideration by this Congress.

Since the price of crude oil makes up a significant portion of the cost of diesel fuel, reducing crude oil prices should have a beneficial impact on diesel prices. Applying basic economic principles,

if crude oil supplies increase and demand remains the same, then the upward pressures on products derived from crude, such as crude oil, should lessen. To increase crude oil supplies, Congress should permit the moratorium on oil and gas exploration on the Outer Continental Shelf to lapse at the end of this month and free our nation's energy industries to increase crude oil supplies.

Congress also should encourage continued domestic refining capacity expansion by extending and expanding the refinery expensing provision in section 1323 of the Energy Policy Act of 2005. We were pleased to see such a provision in the most recent energy tax package released by the Senate Finance Committee and strongly support that provision. This initiative encourages the expansion of domestic refineries and a resultant increase in diesel fuel supplies.

However, the same Senate Finance bill that includes the refinery expansion provision also includes tax measures that will raise the cost of capital on domestic refiners – in effect, washing away the capacity expansion incentives in other sections of the bill. Clearly, Congress is sending mixed messages with respect to whether domestic refinery expansions should be encouraged. If this Congress wants domestic refinery capacity increased, then it must adopt policies that further these goals -- not policies that work against them.

The refining industry is further challenged to comply with mandated reductions in diesel sulfur content in 2010 and the enormous federal Renewable Fuel Standard, which includes significant submandates for biodiesel and renewable diesel. Again, these policies respectively discourage increased domestic diesel fuel production and increase the costs of this production.

VIII. CONCLUSION

NPRA members are dedicated to working cooperatively at all levels to ensure an adequate supply of clean, reliable and affordable transportation fuels. We stand ready to work with Congress to ensure a stable and effective fuels policy that utilizes a diversity of resources to improve our national security, assist our consumers and protect our environment, all without jeopardizing the refining

industry's jobs and profitability and other industries dependent on the financial health of the refining industry. I appreciate this opportunity to testify today and welcome your questions.