



Demand for Diesel Fuel:

Perspectives and Future Considerations on Prices and Supply for Diesel Car and Truck Fuel Users

October 2008

Introduction

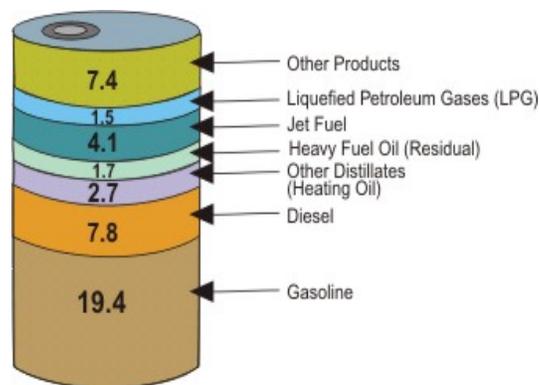
Recent price trends and refinery announcements underscore the growing value of diesel fuel as a key source of energy for both developing and developed countries. This increasing demand for diesel fuel worldwide has impacted fuel consumers in the U.S., through recent increases in diesel fuel prices which are tracking with higher crude prices, and have been outpacing increases in gasoline prices.

In the United States, for many years, diesel fuel prices tended to be lower than gasoline. Since September 2004, this trend has disappeared, with the national average diesel fuel prices tracking or exceeding gasoline. In October 1998 the national average diesel fuel price was \$1.039; and gasoline was \$1.038; as of October 6, 2008 gasoline was \$3.484 and diesel \$3.875. The average diesel price in the U.S. is now 84 cents higher than one year ago (gasoline is 71.4 cents more). *(To get weekly updated gas and diesel price information visit www.EIA.DOE.gov).*

This price differential is due to a variety of factors; global and domestic supply and demand forces, economic growth and regulatory and political forces. Both gasoline and diesel fuel prices will increase as the price of crude oil rises, however other influences have worked to accelerate diesel's price relative to gasoline. This paper provides a brief summary of the petroleum refining process and the various forces contributing to the current price spread between gasoline and diesel fuel, and perspectives on the future for diesel fuel supply and prices in the US.

Fuel production

Each barrel of oil is 42 gallons, approximately 19 percent of which is generally dedicated to the production of diesel fuel, based on current refinery structure. This compares to approximately 47 percent used for gasoline and 10 percent for kerosene-type jet fuel. The remaining 24 percent is split among a variety of oils and gases. While refiners have some ability to alter these percentages, they are unlikely to swing more than 7-8 percent in any direction. As a result, each barrel of crude oil will always produce more gasoline than diesel fuel.



Why have diesel prices risen so significantly in the last few years?

Fuel demand

Demand for distillates – such as diesel and jet fuel – in Europe, Asia, and the Middle East has continued to grow at a faster pace than gasoline. In most cases, this demand is due to the need for developing infrastructure – construction and agricultural equipment and heavy commercial trucks to move goods as

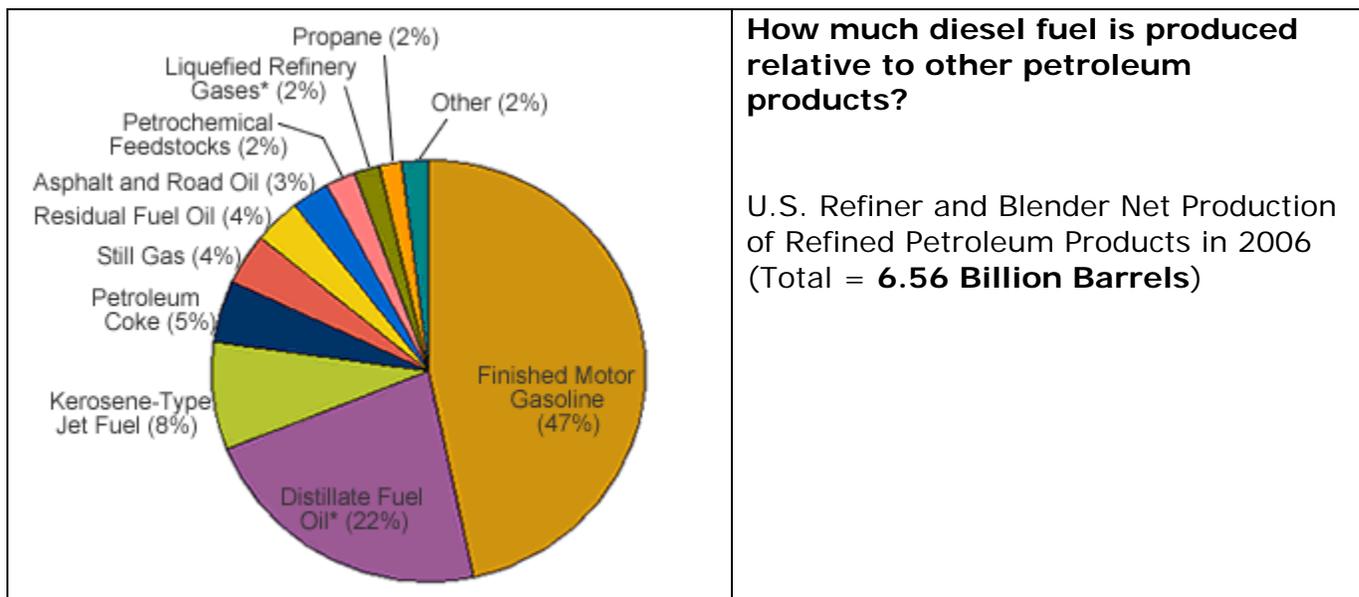
developing countries become more industrialized. In Europe, financial incentives have successfully incentivized the use of diesel fuel over gasoline such that in the European Union countries last year diesel cars made up 53 percent of all new cars sold.

U.S. refineries are optimized to produce gasoline, since that is the predominant petroleum product in the U.S. In 2008, weakness in the economy in part due to high fuel prices has led to the first ever decline in vehicle miles traveled and a softening in gasoline demand. So while gasoline prices increased this past winter due to surging crude oil prices, they have not risen as high as they would have if year-on-year gasoline demand growth was unfolding at normal rates. As a result, the gap between U.S. gas and diesel prices has grown.

These shifting patterns have even affected seasonal changes in diesel fuel prices. According to the Energy Information Administration (EIA), gasoline is usually more expensive than diesel in the spring and summer, the peak driving season. In the autumn, demand for distillate fuels (heating oil and diesel) picks up due to farm use and trucking of goods ahead of the holidays while the demand for gasoline begins to soften.

Inventories and Supply Balances

As Europe’s demand for diesel has grown through the dieselization of the passenger fleet, economic growth, tighter emissions standards and other factors, Europe’s supply capacity has been strained. At the same time, a supply shortage also developed in the U.S. due in part to U.S. exports of distillate fuel to Latin America and Europe to meet their high demand, leaving diesel fuel inventories at their lowest level in five years. Exports of diesel fuel have been increasing. Since 1998, diesel consumption has outstripped gasoline in the European Union Countries (27 countries: EU +14). In 2005, they exported 43 million metric tons of gasoline (110 Mmt consumed inside the EU27; 13 percent of diesel fuel demand was imported from the U.S.).



Source: U.S. Energy Information Administration www.eia.doe.gov

Environmental Standards: Producing Ultra-Low Sulfur Diesel Fuel

Effective June 1, 2006, refineries in the U.S. began producing a minimum of 80 percent of their highway diesel fuel as ultra-low sulfur diesel fuel (ULSD). By September 1, 2006 this fuel was available at all retail pumps in California, and October 15, 2006 the majority (minimum of 80 percent) of diesel fuel pumps in the U.S. (see www.clean-diesel.org for more info on the ultra-low sulfur diesel fuel requirements and timetables). Sulfur is a naturally occurring compound in crude oil and its removal requires the use of hydrogen or other methods to extract sulfur from the product stream.

The cost of ULSD has been the subject of various estimates by EPA and oil industry experts. In a September 2008 testimony in the U.S. Senate Energy and Natural Resources, the Energy Information Administration cited data showing that ULSD is typically trading at a price premium of 13-14 cents per gallon over higher sulfur diesel fuel. EPA had estimated the costs to be in the 5-8 cents per gallon range during the initial rulemaking.

Economic, Political and Other Factors Driving Up Diesel Fuel Prices

In addition to the fundamental laws of supply and demand, there are a number of other factors affecting the price of diesel. These include:

- Current economic conditions in the U.S. relative to the banking and lending crisis have and will have a greater effect of putting the brakes on economic growth and therefore the demand for energy is likely to soften in accord with economic slowdowns.
- A weakened U.S. dollar buys less crude oil on the global market than in past years.
- As energy prices rise, investors are putting more dollars into energy stocks and predictions of future crude oil prices, which helps drive up energy prices even further.

Fuel Taxes

Another factor in diesel and gasoline costs are motor fuel taxes collected at the federal, state and sometimes the local level. The federal motor fuels tax goes toward the highway trust fund; a fund established to repair and maintain the nation's highway infrastructure. State taxes are used for a variety of purposes.

Since October 1, 1997, the federal government has imposed a 24.4 cents-per-gallon tax on diesel fuel compared to an 18.4 cents-per-gallon tax on gasoline. Every state also levies a diesel tax the average of which is 22 cents per gallon (ranging from 8 cents in Alaska to 32.9 cents in Wisconsin). Some states levy the same tax rate on gasoline and diesel fuel, however 15 states currently tax diesel more than gasoline with only six states imposing higher gasoline taxes. More information on state fuel taxes can be found [here](#).

Energy Prices Higher; Future Diesel Fuel Prices to Follow

All energy prices are expected to remain high in the near future. EIA's [Short-Term Energy Outlook](#) is projecting that diesel fuel will continue to sell at a higher price than gasoline over the next few years, although the price differential between the two fuels is expected to narrow. Retail diesel fuel prices in 2008 are projected to average \$3.94 per gallon, and then drop to an average of \$3.67 per gallon in 2009.

Continuing or expanding economic growth in developing countries like India and China will add pressure to crude oil and finished distillate product prices. However, there are several key U.S. policy influences and market developments that could reduce the demand for crude oil and petroleum products in the U.S. – particularly gasoline.

- Oil companies are responding to the increasing demand for diesel fuel through unprecedented growth in new refining capacity and shifts in production.¹ Seven separate refinery announcements of new or expanded distillate fuel refining capacity have been announced in the last six months.
- The Renewable Fuel Standard and the higher fuel economy standards in the *Energy Independence and Security Act of 2007* ([EISA07](#)) will reduce crude oil and gasoline use.
- Although the U.S. diesel passenger car market is expected to double or triple in the next 5-10 years, diesel vehicles are 20-40 percent more fuel efficient, leading the EIA to project that existing diesel fuel supplies will be able to meet this demand. [Click here for the full EIA presentation.](#)

Clean Diesel Cars still a Great Choice for Consumers: Fuel Efficient, Federal Tax Credits and Fun to Drive!

What does all this mean for consumers driving diesel cars or considering a new diesel car?

The cost of diesel fuel is only one factor in ownership of new clean diesel cars. Higher diesel fuel prices in the short term will lengthen the payback period for diesel owners to get a return on their investment. If a diesel car is 30 percent more fuel efficient than a gasoline car, with gasoline at \$3.75 a gallon, diesel can cost up to \$1.13 more per gallon (or \$4.88 in this example) and a diesel driver will still break even with gasoline in terms of fuel cost. (*Visit www.dieselforum.org and download a Web tool that will allow you to calculate fuel economy savings for diesel versus gasoline car.*)

Making any personal car choice requires taking the long term view on all the factors involved, including performance, purchase price, owning and operating costs, useful life, resale value, fuel economy and fuel prices. The next generation of clean diesel cars offers consumers the best overall ownership value when considering driving performance, fuel efficiency, environmental footprint and resale prices.

¹ **Marathon Petroleum** announced in 2007 an expansion of its Garyville (LA) refinery to increase production by 180,000 barrels/day or 1.2 billion gallons of distillate products annually.

Shell Oil Products US announced an expansion of its Port Arthur (TX) that will make it able to refine 600,000 barrels/day, and make it the largest US refinery. It currently produces 52,000 b/d of distillate products.

Valero plans to spend \$3.8 billion through 2011 to increase diesel production at two of its 17 refineries, the ones in Port Arthur and St. Charles, La. The investment will yield an additional 103,000 barrels per day of ultra-low sulfur diesel coming online in 2010.

NuStar Energy LP is considering adding more than \$300 million in diesel-making equipment at one of two U.S. asphalt refineries it acquired recently from Venezuela. It's making the diesel investment in the one on the Delaware River. New diesel production there could start in 2011.

Tesoro Corp. is switching some gasoline production to diesel without making any large equipment investments. Executives at San Antonio-based Tesoro declined to say how much more diesel is being produced, but the Los Angeles refinery already has shifted production to make 7,000 to 9,000 additional barrels of distillates, including diesel, per day.

Saudi Aramco and Total announced May 15, plans to build a 400,000 barrels per day refinery in Jubail, Saudi Arabia focused mainly on ultralow sulfur distillates, beginning operations end of 2012.

Saudi Aramco, and ConnocoPhillips announced May 2008, a 400,000 barrel per day export refinery in Yanbu, Saudi Arabia. That will produce ultralow sulfur refined products. This refinery will be online by 2013.

Beginning in 2008, consumers will have [more fuel-efficient diesel choices than ever before](#). Thirteen new models were announced by 12 manufacturers at the Detroit Auto Show in January 2008. In addition to a superior driving performance and low-emissions, clean diesel is a technology that provides proven real-world fuel economy benefits under any mix of vehicle operation. New clean diesel cars coming out in 2008-2010 will likely be eligible for a federal fuel tax credit of \$300 to \$3,400 dollars, depending on fuel economy ratings. It was recently announced that purchasers of the new Volkswagen Jetta TDI will qualify for a \$1,300 federal tax credit. Mercedes diesel purchasers are eligible for tax credits of \$900 (ML 320 BlueTEC), \$1,550 R320 BlueTEC, and \$1,800 (GL 320 BlueTEC). [For more information on tax credits and currently available vehicles, click here.](#)

For more information, visit www.dieselforum.org