TESTIMONY OF
DR. MARK COOPER,
DIRECTOR OF RESEARCH
CONSUMER FEDERATION OF AMERICA,
ON BEHALF OF CONSUMER FEDERATION OF AMERICA
AND CONSUMERS UNION

ON

CRUDE OIL: THE SOURCE OF HIGHER PRICES?

BEFORE THE SENATE JUDICIARY COMMITTEE, ANTITRUST, COMPETITION POLICY AND CONSUMER RIGHTS SUBCOMMITTEE

APRIL 7, 2004

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE,

My name is Dr. Mark Cooper. I am Director of Research of the Consumer Federation of America. The Consumer Federation of America (CFA) is a non-profit association of 300 pro-consumer groups, which was founded in 1968 to advance the consumer interest through advocacy and education. I am also testifying on behalf of Consumers Union, the independent, non-profit publisher of *Consumer Reports*.

I greatly appreciate the opportunity to appear before you today to discuss the problem of rising gasoline prices and gasoline price spikes.

The headlines about rising energy prices that are not often written involve the structure of the domestic oil and gas industry and how this allows price manipulation at the pump.

- The gasoline refining and marketing segments of the domestic industry have increased pump prices by $50 to $60 billion in the past four years and domestic natural gas wellhead prices increased by $80 to $100 billion, separate and apart from anything that OPEC has done.

- The bottom line that is overlooked is that at least $50 to $60 billion of after tax windfall profits have gone to the domestic petroleum industry in the past four years.

- The story behind the headline numbers that does not get coverage is that a merger wave in the mid-1990s dramatically increased the concentration of the petroleum industry into the hands of a small number of giant, vertically integrated companies whose business decisions restricted capacity, undermined independents and rendered many markets uncompetitive and vulnerable to manipulation.

Decisions by the oil cartel to increase crude prices have cost consumers, but private business decisions about stockpiles and product supply, and the failure of public policy to slow the growth of demand by promoting efficiency, have cost much more.

Three years ago the analysis we provided in a report entitled *Ending the Gasoline Price Spiral*[1] showed that the explanation given by the oil industry and the Bush Administration for the high and volatile price of gasoline is so oversimplified and incomplete[2] that it must be considered at best misleading. At worst, it is wrong because it points to policies that do not address important underlying causes of the problem and therefore will not provide a solution.

- Blaming high gasoline prices on high crude oil prices ignores the fact that over the past few years the domestic refining and marketing sector have imposed larger increases on consumers at the pump than crude price increases would warrant.

- Blaming tight refinery markets on Clean Air Act requirements to reformulate gasoline ignores the fact that in the mid-1990s the industry adopted a business strategy of

mergers and acquisitions to increase profits that was intended to tighten refinery markets and reduce competition at the pump.

- Claiming that the antitrust laws have not been violated in recent price spikes ignores the fact that forces of supply and demand are weak in energy markets and that local gasoline markets have become sufficiently concentrated to allow unilateral actions by oil companies to push prices up faster and keep them higher, longer than they would be in vigorously competitive markets.

- Eliminating the small gasoline markets that result from efforts to tailor gasoline to the micro-environments of individual cities will not increase refinery capacity or improve stockpile policy to ensure lower and less volatile prices, if the same handful of companies dominate the regional markets.

- Blaming natural gas price increases on crude oil prices ignores that fact that natural gas wellhead prices have increased much faster than the price of oil. Natural gas markets lack liquidity and transparency and have been manipulated. The merger wave led by the major petroleum companies has impacted the natural gas market.

Thus, the causes of record energy prices involve a complex mix of domestic and international factors. The solution must recognize both sets of factors, but the domestic factors must play an especially large part in the solution, not only because they are directly within the control of public policy, but also because careful consideration of what can and cannot be done leads to a very different set of policy recommendations than the Administration and the industry have been pushing, or the Congress is considering in the pending energy legislation.

Because domestic resources represent a very small share of the global resources base and are relatively expensive to develop, it is folly to exclusively or predominantly pursue a supply-side solution to the energy problem. The increase in the amount of oil and gas produced in America will not be sufficient to put downward pressure on world prices; it will only increase oil company profits, especially if large subsidies are provided, as contemplated in pending energy legislation. Moreover, even if the U.S. could affect the market price of basic energy resources, which is very unlikely, that would not solve the larger structural problem in domestic markets.

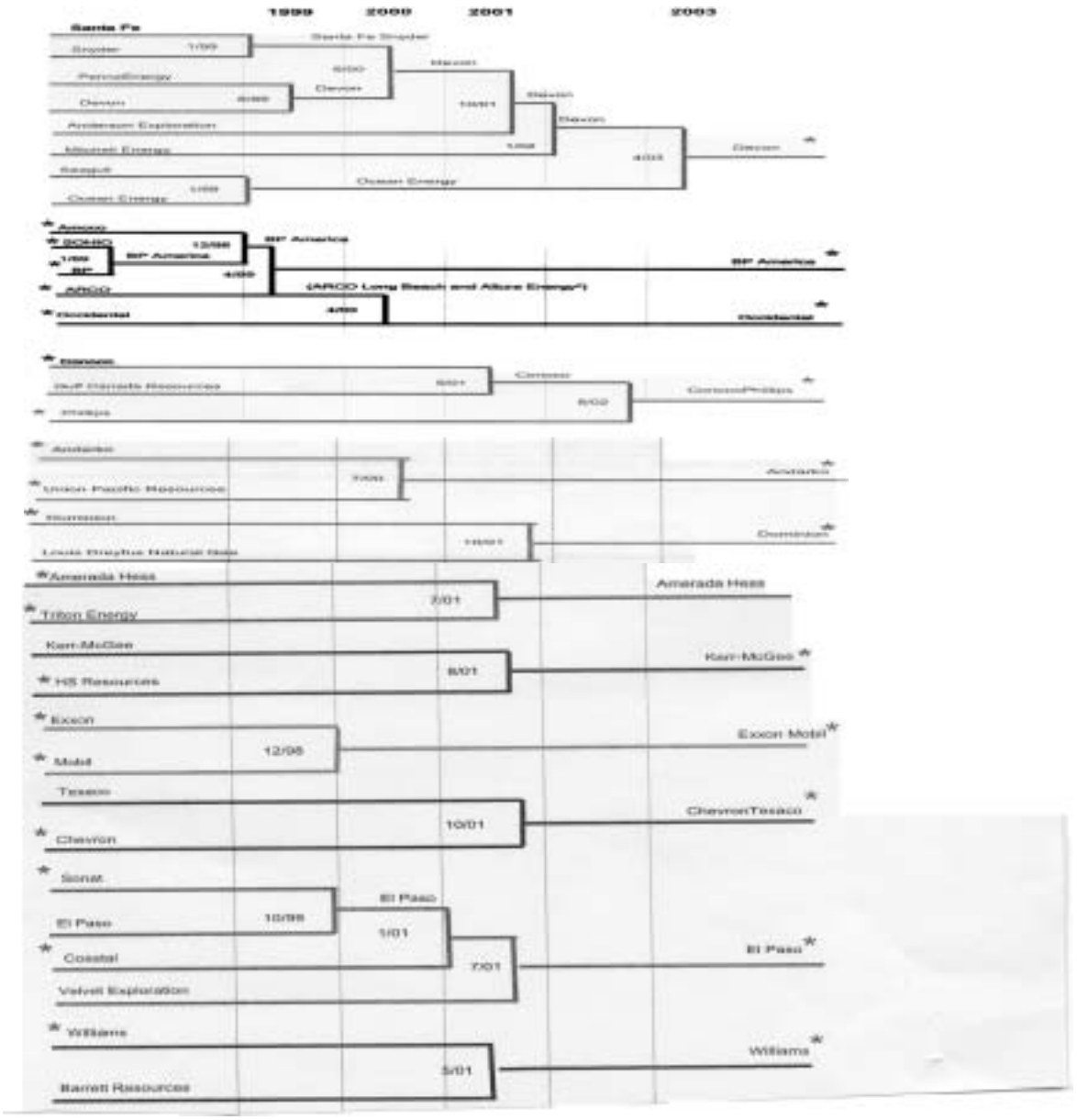
THE UNDERLYING STRUCTURAL PROBLEM IN DOMESTIC PETROLEUM MARKETS

Our analysis shows that energy markets have become tight in America because supply has become concentrated and demand growth has put pressure on energy markets. This gave a handful of large companies pricing power and rendered the energy markets vulnerable to price shocks. While the operation of the domestic energy market is complex and many factors contribute to pricing problems, one central characteristic of the industry stands out – it has become so concentrated in several parts of the country that competitive market forces are weak. Long-term strategic decisions by the industry about production capacity interact with

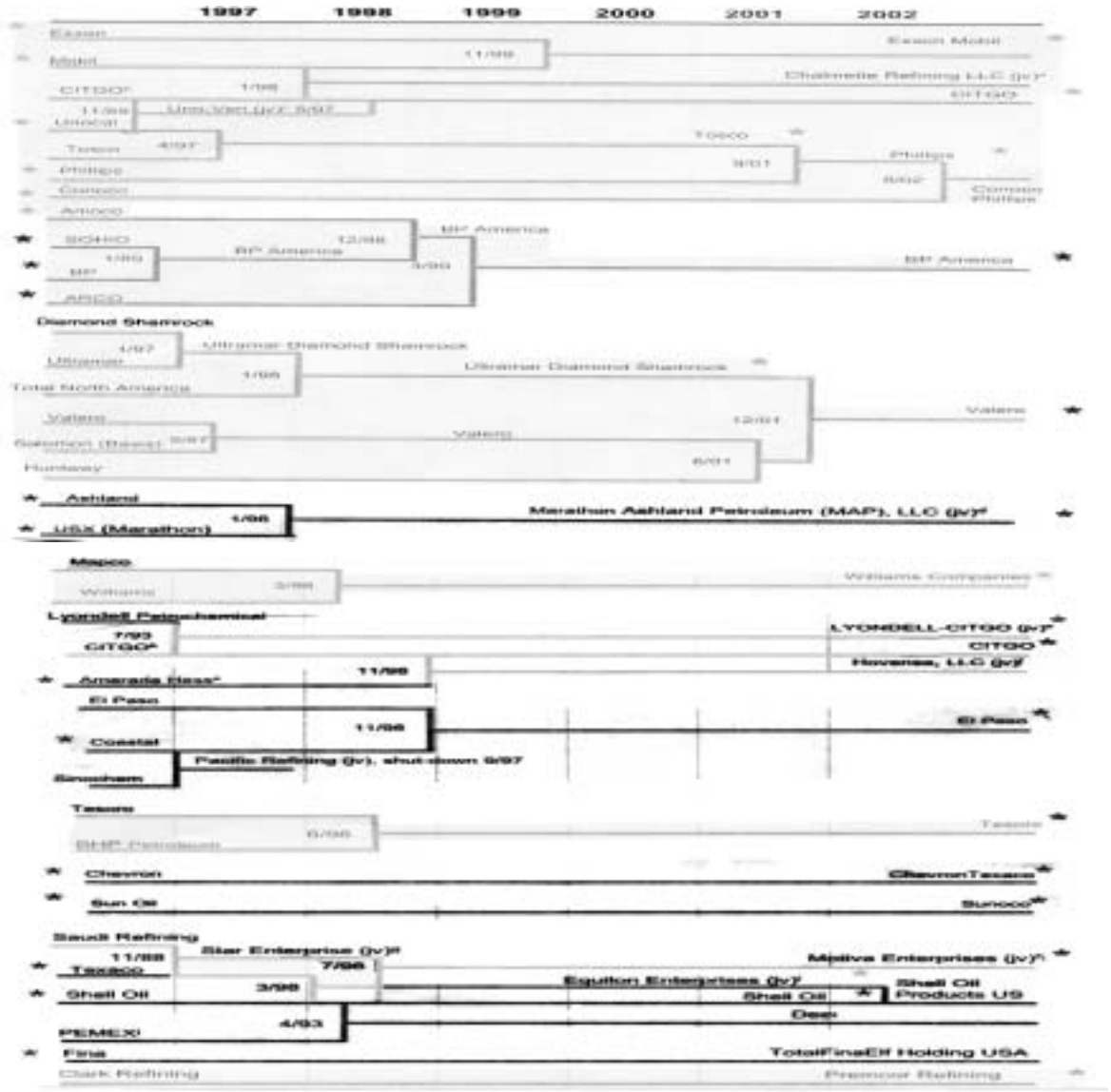
short-term (mis)management of stocks to create a tight supply situation that provides ample opportunities to push prices up quickly. Because there are few firms in the market and because consumers cannot easily cut back on energy consumption, prices hold above competitive levels for significant periods of time.

The problem is not a conspiracy, but the rational action of large companies with market power. With weak competitive market forces, individual companies have flexibility for strategic actions that raise prices and profits. Individual companies can let supplies become

RECENT MERGERS AFFECTING FRS OIL AND GAS PRODUCERS



GENEALOGY OF THE 2001 FRS REFINERS



tight in their area and keep stocks low, since there are few competitors who might counter this strategy. Companies can simply push prices up when demand increases because they have no fear that competitors will not raise prices to steal customers. Individual companies do not feel compelled to quickly increase supplies with imports, because their control of refining and distribution ensures that competitors will not be able to deliver supplies to the market in their area. Because there are so few suppliers and capacity is so tight, it is easy to keep track of potential threats to this profit maximizing strategy. Every accident or blip in the market triggers a price shock and profits mount. Moreover, operating the complex system at very high levels of capacity places strains on the physical infrastructure and renders it susceptible to accidents.

It has become evident that stocks of product are the key variables that determine price shocks. In other words, stocks are not only the key variable; they are also a strategic variable. The industry does a miserable job of managing stocks and supplying product from the consumer point of view. Policymakers have done nothing to force them to do a better job. If the industry were vigorously competitive, each firm would have to worry a great deal more about being caught with short supplies or inadequate capacity and they would hesitate to raise prices for fear of losing sales to competitors. Oil companies do not behave this way because they have power over price and can control supply. Mergers and acquisitions have created a concentrated industry in several sections of the country and segments of the industry. The amount of capacity and stocks and product on hand are no longer dictated by market forces, they can be manipulated by the oil industry oligopoly to maximize profits.

Much of this increase in industry profits, of course, has been caused by an intentional withholding of gasoline supplies by the oil industry. In a March 2001 report, the Federal Trade Commission (FTC) noted that by withholding supply, industry was able to drive prices up, and thereby maximize profits.[3] The FTC identified the complex factors in the spike and issued a warning.

> The spike appears to have been caused by a mixture of structural and operating decisions made previously (high capacity utilization, low inventory levels, the choice of ethanol as an oxygenate), unexpected occurrences (pipeline breaks, production difficulties), errors by refiners in forecasting industry supply (misestimating supply, slow reactions), and decisions by firms to maximize their profits (curtailing production, keeping available supply off the market). The damage was ultimately limited by the ability of the industry to respond to the price spike within three or four weeks with increased supply of products. However, if the problem was short-term, so too was the resolution, and similar price spikes are capable of replication. Unless gasoline demand abates or refining capacity grows, price spikes are likely to occur in the future in the Midwest and other areas of the country.[4]

A 2003 Rand study of the refinery sector reaffirmed the importance of the decisions to restrict supply. It pointed out a change in attitude in the industry, wherein "[i]ncreasing capacity and output to gain market share or to offset the cost of regulatory upgrades is now frowned upon."[5] In its place we find a "more discriminating approach to investment and supplying the market that emphasized maximizing margins and returns on investment rather than product output or market share."[6] The central tactic is to allow markets to become tight.

> Relying on… existing plant and equipment to the greatest possible extent, even if that ultimately meant curtailing output of certain refined product… openly questioned the once-universal imperative of a refinery not "going short" – that is not having enough product to meet market demand. Rather than investing in and operating refineries to ensure that markets are fully supplied all the time, refiners suggested that they were focusing first on ensuring that their branded

> retailers are adequately supplied by curtailing sales to wholesale market if needed.[7]

The Rand study drew a direct link between long-term structural changes and the behavioral changes in the industry, drawing the connection between the business strategies to increase profitability and the pricing volatility. It issued the same warning that the FTC had offered two years earlier.

> For operating companies, the elimination of excess capacity represents a significant business accomplishment: low profits in the 1980s and 1990s were blamed in part on overcapacity in the sector. Since the mid-1990s, economic performance industry-wide has recovered and reached record levels in 2001. On the other hand, for consumers, the elimination of spare capacity generates upward pressure on prices at the pump and produces short-term market vulnerabilities. Disruptions in refinery operations resulting from scheduled maintenance and overhauls or unscheduled breakdowns are more likely to lead to acute (i.e., measured in weeks) supply shortfalls and price spikes.[8]

The spikes in the refiner and marketer take at the pump in 2002, 2003 and this year, were larger than the 2000 spike that was studied by the FTC. The weeks of elevated prices now stretch into months. The market does not correct itself. The roller coaster has become a ratchet. The combination of structural changes and businesses strategies has ended up costing consumers billions of dollars. Until the Federal government is willing to step in to stop oil companies from employing this anti-consumer strategy, there is no reason to believe that they will abandon this practice on their own.

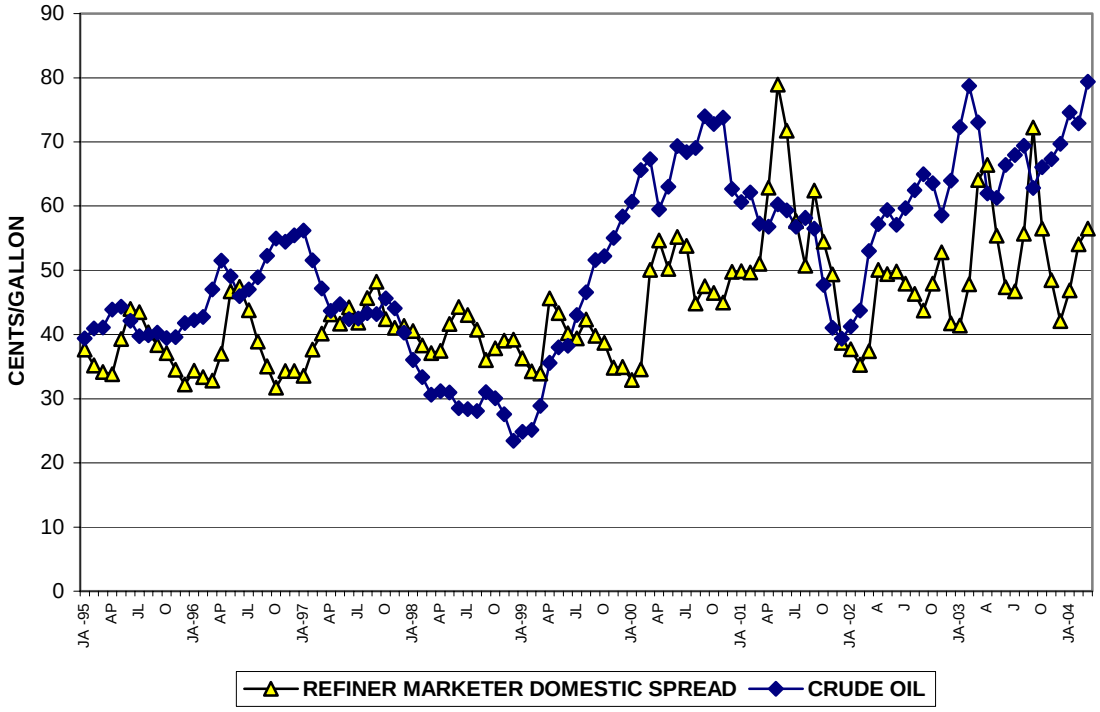
As we demonstrated in a report last year, entitled *Spring Break In the U.S. Oil Industry: Price Spikes, Excess Profits and Excuses*,[9] the structural conditions in the domestic gasoline industry have only gotten worse as demand continues to grow and mergers have been consummated. The increases in prices and industry profits should come as no surprise.

THE RECENT GASOLINE PRICE RATCHETS

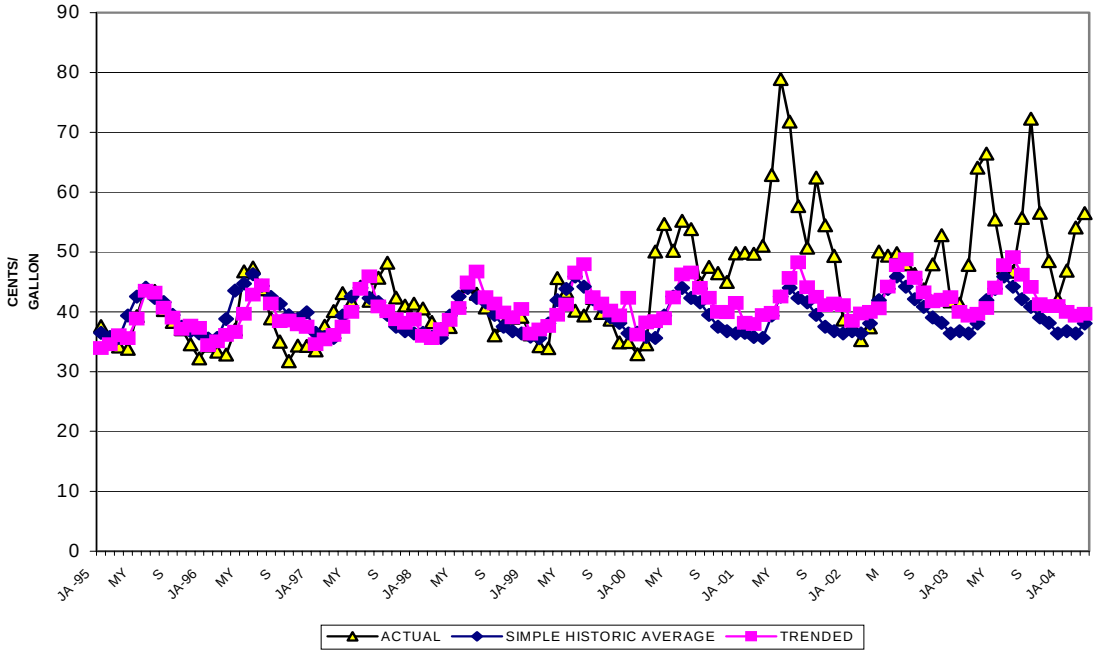
If we examine the two most important components of the pump price of gasoline, crude oil and the domestic refiner/marketer spread, we find that crude oil prices increased sharply in 1999 and 2000, peaking just before the election of 2000. However, **the record prices we see today are the result of the combination of historic highs in both crude and the domestic spread.**

The domestic spread is the share of the pump price accounted for by the refining and marketing of gasoline. It excludes the price of crude, which is set by OPEC (the Organization of the Petroleum Exporting Countries) and taxes. The domestic spread increased somewhat in 2000, but it moved up more sharply after the election, peaking in the spring of 2001. Thus, in

THE CONVERGENCE OF HIGH DOMESTIC REFINER/ MARKETER SPREADS AND CRUDE OIL HAVE PRODUCED THE RECORD HIGH GASOLINE PRICES



THE DOMESTIC SPREAD ON GASOLINE HAS SKYROCKETTED SINCE 2001



the spring of 2001, when the National Energy Policy Development Group was formed, crude oil prices were well off their historic highs, while the domestic spread was at its peak.

The price spike of early 2001, driven largely by domestic factors, was used as a justification for the formation of the National Energy Policy Development Group. The irony of the misplaced blame can be seen when we contrast crude oil pricing since January of 2001 and the domestic spread since January 2001. Crude prices fell much more than the domestic spread during the recession of winter 2001-2002. In 2003 the domestic spread spiked again before crude prices rose.

Compared to the simple historical average for the domestic spread, the domestic spread price shock resulted in increases of over $60 billion since 2000. Compared to a trended baseline, the domestic spread price shock resulted in increases of about $50 billion.

NATURAL GAS

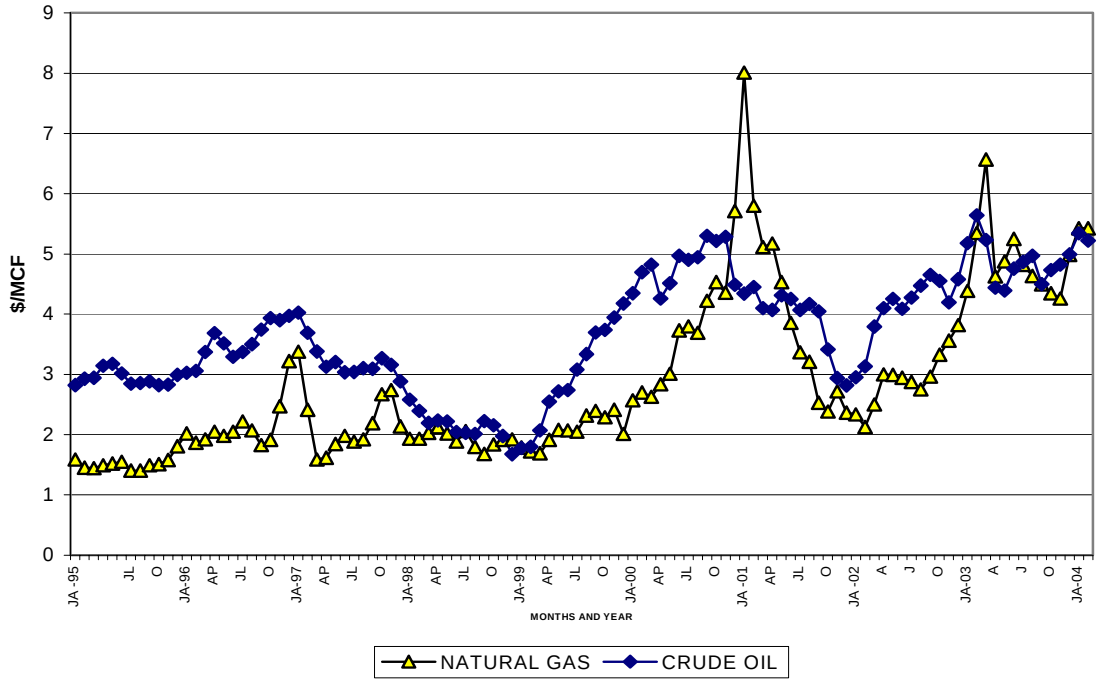
Behavior patterns in natural gas raise similar concerns. They cast doubt on the recent claim of the National Petroleum Council (NPC) that the natural gas resource base has suddenly changed.[10] First, as a factual matter, non-industry analysts disagree.[11] Second, to the extent that there is a change in resource recovery, it reflects business decisions over a number of years.

The move of the major oil companies into gas changed the nature of the sector.[12] Decisions by these majors to acquire reserves through mergers and acquisitions, rather than exploration, shifts resources.[13] Decisions about which types of wells to drill may change replacement rates.[14] Decisions about which well to produce and which well to cap, how much to inject into storage, how to use pipeline capacity and, ultimately, how to report prices, are affected by business decisions. The consolidation in the industry came hand-in-hand with the shift to acquisition of resources through mergers and a shift of drilling away from exploration. A couple of years latter the NPC concludes that a change in the understanding of the underlying resource base has occurred, when it may only be a change in the business strategies to develop the resource base that has occurred.

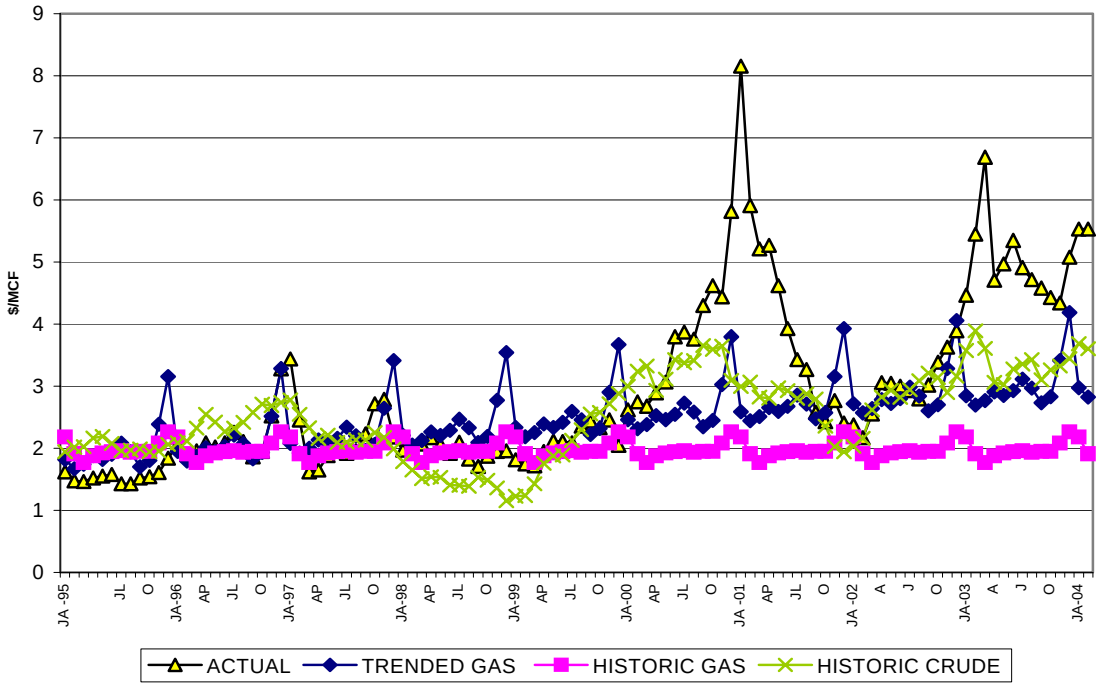
It is also important to recognize in the case of natural gas that the markets that drive the wellhead price are quite new. Most were set up in the 1990s, as part of the restructuring of the natural gas industry.[15] Enron played a large role in these markets, and when it collapsed, so too did much private trading.[16] Today, the markets are “very thin” and that raises concerns about trading, but the evidence is mounting that manipulation and abusive practices have long been part of these markets.[17]

The picture for natural gas wellhead prices is similar to the domestic spread.[18] Natural gas is overwhelmingly produced from domestic sources. There was a run-up in prices in mid-2000 and then a peak in early 2001, reinforcing the sense of an energy crisis. Prices tumbled

WELLHEAD PRICE OF NATURAL GAS



NATURAL GAS PRICES COMPARED TO HISTORIC TRENDS



during the 2001-2002 recession, but have mounted again and have stabilized at over twice the level of the late 1990s.

We can compare the price of natural gas to the price of crude oil to isolate the change in domestic natural gas pricing behavior. It is certainly true that natural gas prices respond to oil prices, but because they are not substitutes in many uses, the correlation between the two sets of prices was moderate. Moreover, between January 1995 and January 2001, the average price of natural gas at the wellhead was 66 percent of the average price of crude oil. Since January 2001, it has averaged about 90 percent of the price of crude. The stakes are huge. The difference between a price trend for natural gas which did not close the gap with oil and what actually occurred is over $1 per thousand cubic feet (mcf), which totals to over $80 billion. Even in 2000, when domestic prices started to become volatile, it averaged 76 percent of the price of crude. Clearly, there was a shift in the domestic market behavior that started in 2000, but became most prominent in 2001 and later years.

The Industrial Energy Consumers of America used a simple average price to arrive at a much higher figure. Using their simple average, the increase since 2000 in natural gas wellhead prices would be about $150 billion. Even when stocks built up and passed historic levels, prices remained extremely high.[19] Using a trended historic gas price puts the figure at about $100 billion.

PROFITS

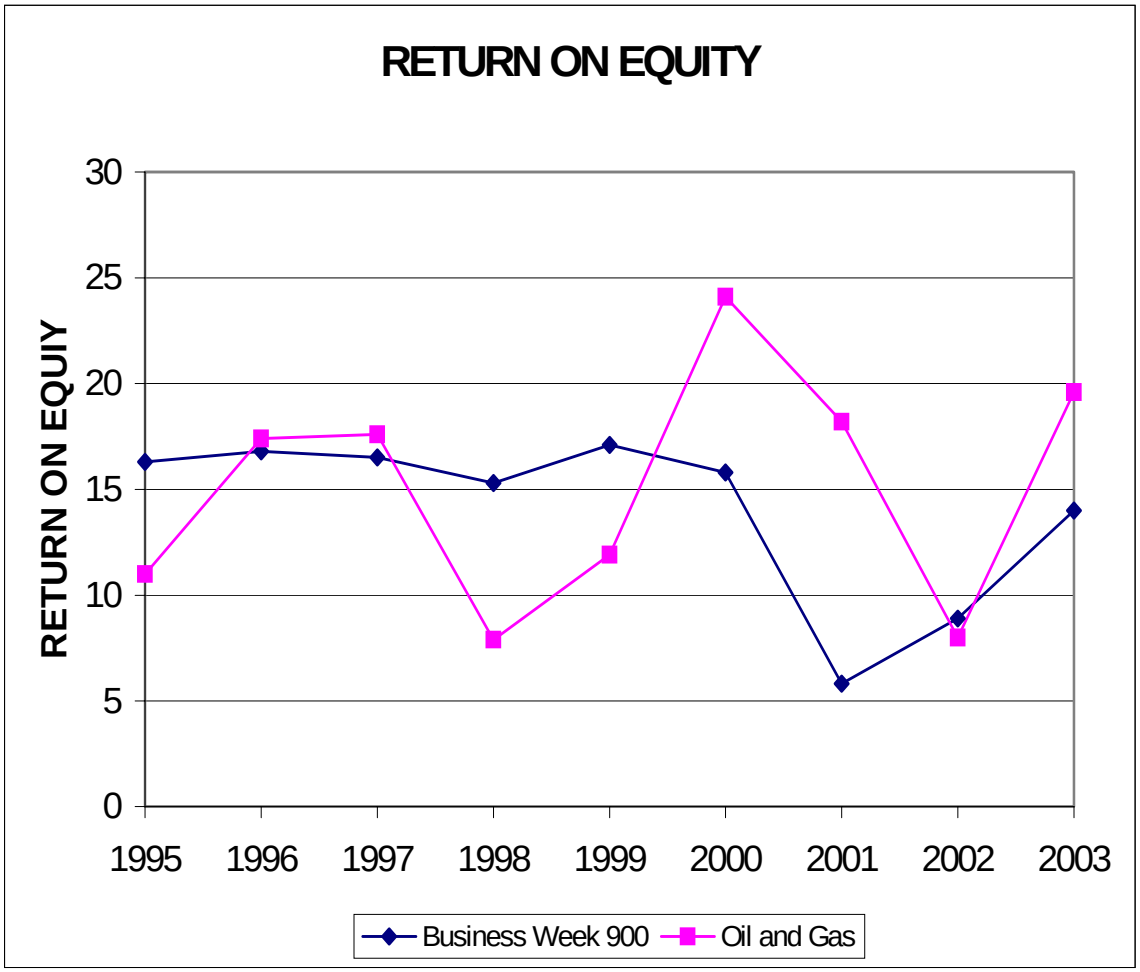
Since price increases at the pump and wellhead are not caused by cost increases, they result in increases in profits. Thus, after price, the second important indicator to which economic analysts look for signs of the exercise of market power and market failure is profits.

The bottom line, literally and figuratively, was a sharp run up in oil company profits from domestic refining and marketing in 2000 and 2001. Net operating income (income before special items and taxes) tripled from 1997-1999 to 2001.[20] While profits were down in 2002, due to very low prices early in the year as result of the severe economic downturn and travel slow-down following September 11, they skyrocketed in 2003. About half of the increase in the domestic spread has been carried to the bottom line in the form of operating income.

Since domestic petroleum companies are large owners of oil and gas reserves, they also profit from increases in the global price of oil. Starting in 2000 profits soared. *Fortune* reports return on equity of 25 percent in 2000,[21] while *Business Week* reports 22 percent.[22] This is almost twice the historic average for the industry and about 50 percent more than other large corporations achieved.[23] Profits were even higher in 2001. The weak economy lowered prices and profits early in 2002, but by the end of 2002, profits had increased dramatically and for the year, they were at about the average for the industry in the 95-99 period. The sharp price increases

in 2003 produced another very high level of profits. By the end of 2003 the industry was seeing record profits once again.[24]

If we compare the annual after-tax profits of the companies listed by *Business Week* in the oil and gas industry in the first four years of the new millennium to the last five years of the 1990s, we find a huge increase in profits. If recent profits are compared to the simple average of the 1995-1999 period, the increase is over $50 billion. This figure of $50 billion is based only on the companies included in the *Business Week* survey, which account for less than half of all domestic natural gas (and crude oil) production and about 80 percent of all refinery capacity. Thus, the total increase in profits across the entire sector is likely to be much larger. Even if we assume that the oil and gas sector 'should' have earned the national average for the very large firms included in the *Business Week* survey, the excess earnings since the turn of the millennium would be about $44 billion. The oil and gas companies have enjoyed a huge jump in profits compared to the other large corporations in the economy.



A Comprehensive Domestic Solution

We all would like immediate, short-term relief from the current high prices, but what we need is an end to the roller coaster and the ratchet of energy prices. That demands a balanced, long-term solution. Breaking OPEC's pricing power would relieve a great deal of pressure from consumers' energy bills, but the short-term prospects are not promising in that regard either. There, too, we need a long-term strategy that works on market fundamentals.

Three years ago we outlined a comprehensive policy to implement permanent institutional changes that would reduce the chances that markets will be tight and reduce the exposure of consumers to the opportunistic exploitation of markets when they become tight. Those policies made sense then; they make even more sense today. The Federal government has done little to move policy in that direction since it declared an energy crisis in early 2001.

To achieve this reduction of risk, public policy should be focused on achieving four primary goals:

- Restore reserve margins by increasing both fuel efficiency (demand-side) and refining production capacity (supply-side).
- Increase market flexibility through stock and storage policy.
- Discourage private actions that make markets tight and/or exploit market disruptions by countering the tendency to profiteer by withholding of supply.
- Promote a more competitive industry.

Expand Reserve Margins By Striking A Balance Between Demand Reduction and Supply Increases

Improving vehicle efficiency (reduction in fleet average miles per gallon) equal to economy wide productivity over the past decade (when the fleet average failed to progress) would have a major impact on demand. It would require the fleet average to improve at the same rate it did in the 1980s. It would raise average fuel efficiency by five miles per gallon, or 20 percent over a decade. This is a mid-term target. This rate of improvement should be sustainable for several decades. This would reduce demand by 1.5 million barrels per day and return consumption to the level of the mid-1980s.

Expanding refinery capacity by ten percent equals approximately 1.5 million barrels per day. This would require 15 new refineries, if the average size equals the refineries currently in use. This is less than one-third the number shut down in the past ten years and less than one-quarter of the number shut down in the past fifteen years. Alternatively, a ten percent increase in the size of existing refineries, which is the rate at which they increased over the 1990s, would do the trick, as long as no additional refineries were shut down.

Placed in the context of redevelopment of recently abandoned facilities or expansion of existing facilities, the task of adding refinery capacity does not appear daunting. Such an

expansion of capacity has not been in the interest of the businesses making the capacity decisions. Therefore, public policies to identify sites, study why so many facilities have been shut down, and establish programs to expand capacity should be pursued.

Efficiency improvements can be achieved in natural gas consumption as well, which can alleviate the tightness in that market and have a significant price disciplining effect.[25] The benefits can be achieved both directly through improvements in space heating and industrial applications, but also indirectly through reduction in electricity consumption because natural gas has become increasingly important for summer peak generation.

Expanding Storage And Stocks

It has become more and more evident that private decisions on the holding of crude and product in storage will maximize short-term private profits to the detriment of the public. Increasing concentration and inadequate competition allows stocks to be drawn down to levels that send markets into price spirals.

The Strategic Petroleum Reserve is a crude oil stockpile that has been developed as a mechanism to deal with dire emergencies that would result in severe shortfalls of crude.[26] It could be viewed and used differently, but it has almost never been used, and never aggressively used, as an economic reserve to respond to price increases. Given its history, drawdown of the SPR is at best a short-term response.

Private oil companies generally take care of storage of crude oil and product to meet the ebb and flow of demand.[27] The experience of the past four years indicates that the marketplace is not attending to economic storage. Companies do not willingly hold excess capacity for the express purpose of preventing price increases. They will only do so if they fear that a lack of supply or an increase in brand price would cause them to lose business to competitors who have available stocks. Regional gasoline markets appear to lack sufficient competition to discipline anti-consumer private storage policies.

Public policy must expand economic stocks of crude and product. Gasoline distributors (wholesale and/or retail) can be required to hold stocks as a percentage of retail sales. Public policy could also either directly support or give incentives for private parties to have sufficient storage of product. It could lower the cost of storage through tax incentives when drawing down stocks during seasonal peaks. Finally, public policy could directly underwrite stockpiles. We now have a small Northeast heating oil reserve. It should be continued and sized to discipline price shocks, not just prevent shortages. Similarly, a Midwest gasoline stockpile should be considered.

Taking The Fun and Profit Out of Market Manipulation

In the short term, government must turn the spotlight on business decisions that make markets tight or exploit them. Withholding of supply should draw immediate and intense

public scrutiny, backed up with investigations. State government should be authorized and supported in market monitoring efforts. A joint task force of federal and state attorneys general could be established on a continuing basis. The task force should develop databases and information to analyze the structure, conduct and performance of gasoline and natural gas markets.

As long as huge windfall profits can be made, private sector market participants will have a strong incentive to keep markets tight. The pattern of repeated price spikes and volatility has now become an enduring problem. Because the elasticity of demand is so low – because gasoline and natural gas are so important to economic and social life – this type of profiteering should be discouraged. A windfall profits tax that kicks in under specific circumstances would take the fun and profit out of market manipulation.

Ultimately, market manipulation, including the deliberate withholding of supply, should be made illegal. This is particularly important for commodity and derivative markets.

Promoting A Workably Competitive Market

Further concentration of these industries is quite problematic. The Department of Justice Merger Guidelines should be rigorously enforced. Moreover, the efficiency defense of consolidation should be viewed skeptically, since inadequate capacity is a problem in these markets. The low elasticity of supply and demand should be considered in antitrust analysis.

Restrictive marketing practices, such as zonal pricing and franchise restrictions on supply acquisition, should be examined and discouraged. These practices restrict flows of product into markets at key moments.

Consideration of expanding markets with more uniform reformulation requirements should not involve a relaxation of clean air requirements. Any expansion of markets should ensure that total refinery capacity is not reduced.

Every time energy prices spike, policymakers scramble for quick fixes. Distracted by short-term approaches and obsessed with placing the blame on foreign energy producers or environmental laws, policymakers have failed to address the fundamental causes of the problem. In the four years since the energy markets in the United States began to spin out of control we have done nothing to increase competition, ensure expansion of capacity, require economically and socially responsible management of crude and product stocks, or slow the growth of demand by promoting energy efficiency. We have wasted four years and consumers are paying the price with record highs at the pump and the burner tip.

SOURCE AND NOTES:

Exhibits:

Prices, quantities and trend line projections are based on U. S. Department of Energy, Energy Information Administration databases accessed by online publication URLs as follows: *Monthly Energy Review* – Gasoline: Table 3.4 for quantities supplied, Table 9.4, for pump prices; Natural Gas: Table 4.1 for production, Table 9.11 for Prices; Crude Table 3.1 for quantities, Petroleum *Marketing Monthly,* Table 1 for crude prices and Table 6 for prices net of taxes. Most recent months are calculated from weekly averages in *Weekly Petroleum Status Report, This Week in Petroleum, Natural Gas Weekly Update, Gasoline and Diesel Fuel Update.*

Mergers: Energy Information Administration, *Performance Profiles of Major Energy Producers: 2002*,February 2004, Figure 6; Energy Information Administration, *Performance Profiles of Major Energy Producers: 2001*, January 2003, Figure 33.

Return on Equity, "Full Year Results for 900 Companies," *Business Week*, Annual, 1995-2003.

Endnotes

[1] Cooper, Mark, *Ending the Gasoline Price Spiral* (Washington D.C.: Consumer Federation of America July 2001).

[2] "Text of the Speech of President Bush," in releasing the National Energy Policy Development Group, *National Energy Policy* (Washington, D.C.: May 2001), *Washington Post*, May 18, 2001, set the tone of directing attention to the international market "overdependence on any one source of energy, especially a foreign source, leaves us vulnerable to price shocks, supply interruptions and in the worst case, blackmail."

[3] Federal Trade Commission, *Midwest Gasoline Price Investigation*, March 29, 2001.

[4] Federal Trade Commission, *Midwest Gasoline Price Investigation*, March 29, 2001, pp. i... 4.

[5] Peterson, D.J. and Serej Mahnovski, *New Forces at Work in Refining: Industry Views of Critical Business and Operations Trends* (Santa Monica, CA: RAND Corporation, 2003), p. 16.

[6] Peterson and Mahnovksi, p. 42.

[7] Peterson and Mahnovksi, p. 17.

[8] Peterson and Mahnovski, p. xvi.

[9] Cooper, Mark, *Spring Break in the Oil Industry: Price Spikes, Excess Profits and Excuses (*Washington D.C.: Consumer Federation of America, October 2003).

[10] *Balancing Natural Gas Policy: Fueling the Demands of a Growing Economy* (Washington D.C.: September 2003).

[11] Huntington, Hillard, G. "Presentation to The Future of Natural Gas Markets: A Forum at RFF," November 21, 2004, *EMF 20: Natural Gas, Fuel Diversity and North American Energy Markets*, November 2003, shows the NPC estimate as an extreme outlier in terms of price.

[12] Energy Information Administration, *The Majors' Shift to Natural Gas* (Washington, D.C.: September 2001).

[13] EIA, Energy Information Administration, *Performance Profiles of Major Energy Producers: 2002*,February 2004, pp. 81-83.

[14] EIA, Performance Profiles: 2002, pp. 71-72.

[15] Energy Information Administration, *The Natural Gas Industry and Markets in 2002* (Washington, D.C.: February 2004), p. 3.

[16] EIA, The Natural Gas Industry, p. 2.

[17] Beattie, Jeff, "Judge Green Lights Lawsuit Against Enron Trader," Energy Daily, March 15, 2004, notes that the judge "backed the CFTC's argument that Enron was positioned to yank price up because its Enron

Online (EOL) trading platform controlled fully 40 percent of average daily trading on the Henry Hub natural gas spot market."

[18] Industrial Energy Consumers of America, *41 Month Natural Gas Crisis Has Cost U.S. Consumers $111 Billion*, Washington, D.C., December 3, 2003, used a simple average price to arrive at their estimate.

[19] Romero, Simon, "Natural Gas Prices Surge and Fingers are Pointing," *The New York Times*, December 13, 2003, p. C-1. Johnson, Jeff, "Chemical CEOs Protest Natural Gas Prices," *Chemical and Engineering News*, Feb. 2, 2004.

[20] Energy Information Administration, U.S. Department of Energy, *Performance Profiles of Major Energy Producers: 2001* (January 2003), Table B32; *National Petroleum News*, "Signs of Life," March 2003, Corporate, Downstream Earnings for Major Oil Continue to Rebound," October, 2003; oil industry 2003 financial reports.

[21] *Fortune 500*, July 18, 2001.

[22] *Business Week*, Spring 2001, p. 92.

[23] U.S. Department of Energy, Energy Information Administration, *Performance Profile*, 2001, pp. 7-8.

[24] "A Record-Setting Year,' *National Petroleum News*, available at www.petroretail.net/2004/0403/0403qtr.asp.

[25] Elliott, R. Neal, Anna Monis Shipley, Steven Nadel, and Elizabeth Brown, *Natural Gas Price Effects of Energy Efficiency and Renewable Energy Practices and Policies* (Washington, D.C.: American Council for an Energy Efficient Economy, December 2003).

[26]Gove, Philip Babcock, *Webster's Third New International Dictionary* (Springfield MA: 1986), p. 2247, "a reserve supply of something essential as processed food or a raw material) accumulated within a country for use during a shortage caused by emergency conditions (as war)."

[27] Gove, *Webster's Third International*, p. 2252, "The holding and housing of goods from the time they are produced until their sale."