ENERGY *The Brattle Group*

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ENERGY MARKETS : Time for A Broader Perspective

With the nation's attention focused on energy, there is a danger that rising prices in electricity, natural gas, and heating oil will combine with presidential politics to produce a series of misguided initiatives that would serve only to exacerbate the problem. There are, however, moves that could improve matters both now and for the future.

This issue of ENERGY explains how oil, natural gas, and electricity are intertwined in a fashion likely to extend high energy prices into next winter. These relationships are not widely understood, but they are important to creating measured energy and environmental policy responses that will ensure both the cleanliness of our environment and the health of our energy markets and economy.

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For more information please contact Gary Taylor in Cambridge at 617.864.7900, Peter Fox-Penner in Washington at 202.955.5050, or Carlos Lapuerta in London at 0207.491.0843.

INTRODUCTION

Over the last year, energy has become front-page news. Last year brought brown-outs in California and a disturbing spike in New England heating oil prices. This spring, California had a steep run-up in gasoline prices and the Mid-West got a dose of the same medicine in June. High crude oil prices this year have generated endless speculation over OPEC's next move, and California's foray into competitive power markets appears to be on the verge of collapse. Ominous warnings about heating oil and natural gas supplies and prices this winter are now issuing from energy officials.

There is plenty of cause for concern. Even though some of what we are experiencing is temporary, it may nevertheless cause considerable discomfort before it is behind us. Of deeper concern, however, is the fact that much of the current disarray in energy markets stems from problems that will take time to address. OPEC seems likely to retain influence over crude prices for some time, and many of the problems with petroleum product and electric power prices spring from shallow, piecemeal regulatory interventions at both the State and Federal levels that will continue to confound markets. If responses stay focused narrowly upon immediate price relief to consumers, then the cycle of price spikes and almost rhetorical official recriminations against corporate misbehavior now seen in the petroleum and electric power industries will be replayed repeatedly to no avail while true causes go unattended.

Fortune seems to have blessed the Eastern U.S. with a cool summer, problems could have been much worse. Even so, the current situation should be sufficient warning that this summer's high prices for gasoline and electricity will be mirrored in heating oil and natural gas prices this winter and that high energy prices may persist through next year and beyond. Steps should be taken now to limit the more severe impacts of such prices, but it is critical that we understand how these problems arose in order to avoid responses that will not help and that could prolong our unfortunate situation.

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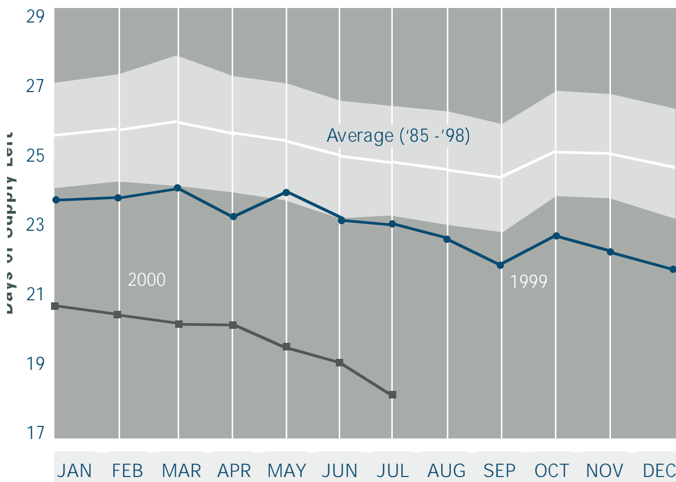
The Brattle Group consults on economic, financial, environmental, engineering, and management matters to corporations, law firms, and public agencies world-wide.

DISRUPTIONS IN THREE MAJOR ENERGY MARKETS

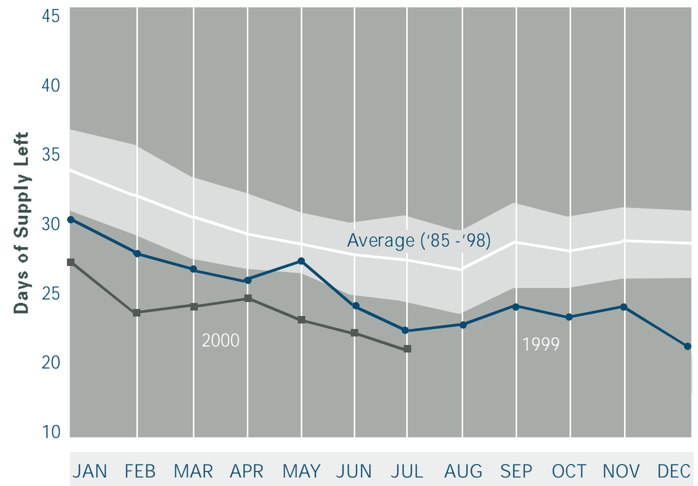
This current chapter of the energy saga started in March of 1999 when OPEC reduced its oil production rates.[1] Following that action, inventories of crude oil fell to below normal levels and prices virtually tripled from about $11/bbl to $33/bbl in twelve months.[2] Small increases in OPEC quotas in April and June 2000 temporarily weakened the momentum in crude oil prices, but were insufficient given growth in demand and already low stock levels. Despite a much ballyhooed plan to raise production automatically if prices exceeded $28 per barrel and Saudi Arabia's threat to unilaterally increase production to reduce prices, OPEC and the Saudis have not produced or promised enough to dent prices significantly, thus fueling speculation and sustaining crude oil price levels.[3] High crude prices obviously work their way through to refined petroleum products prices.

Non-SPR Crude Oil Stocks Remaining

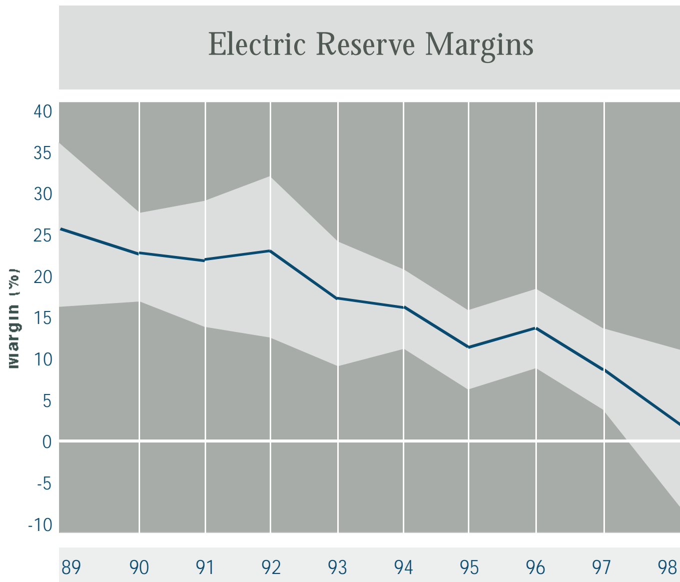


For many consumers first-hand experience with tight energy markets came at the gasoline pump. Motor gasoline prices spiked this spring across the country, and remain high despite retreating from earlier levels. In June they were up 45% over last year on a nationwide basis across all grades, but in some areas such as Chicago and Milwaukee they jumped by almost 64%.[4] For reformulated gasoline (RFG), the cleaner burning blend required by EPA in many major metropolitan areas, the price hikes in some locations were even greater.[5] Currently, they are still high, up about 20% over last year. Crude price increases are partially to blame for the gasoline situation, but low inventories[6] and reduced production and distribution capability resulting from a "patchwork" implementation of air quality mandates clearly contributed to the spike in early summer prices.[7] Availability of RFG has also been limited to some degree by concern over potential royalty obligations to Unocal, which obtained patents covering some of the gasoline blends meeting RFG specifications.[8]

Gasoline Stocks Remaining



Continuing problems in California this summer have also put the spotlight on the perils of haphazard progress toward competition in electric power markets. Deregulation of electric generation in many areas of the country is causing transition difficulties that tax power systems during periods of high demand. Reserve margins, the power system's hedge against demand peaks, have been substantially reduced. Disruptions experienced last summer are occurring once again,[9] and they would have been much more widespread had the Northeast seen California's hot weather.[10]



A DOMINO EFFECT: MORE PROBLEMS AHEAD

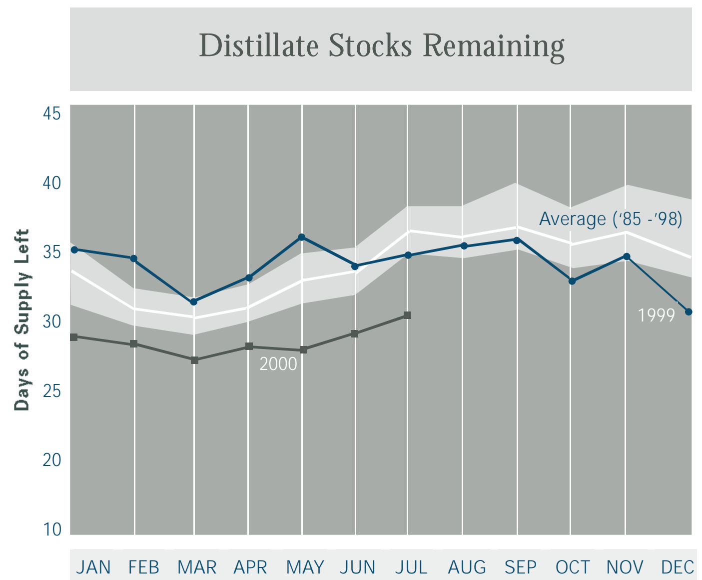
The triple impact of high prices and shortages in crude oil, gasoline, and electric power markets will boil over into the winter. When refiners maximize gasoline production as they did this summer, it comes at the expense of other products such as home heating oil. So they can not build inventories of heating oil as they normally would as cooler weather approaches.[11] This would not be problematic if heating oil inventories were healthy, but early this summer supplies were down more than 20% from last year's levels and have remained low.[12] The expectation of tight supply through the winter is reflected in spot and futures contract prices. The current spot price of nearly $.99 per gallon is more than 75% above that of a year ago, and prices for futures contracts exceed $.90 per gallon through February of 2001.[13]

A similar situation exists with natural gas, the nation's other primary heating fuel. Natural gas is increasingly used in combustion turbines and combined-cycle units to generate electric power. Hot summer weather raises air conditioning load and causes generators to burn more gas for electricity production, keeping prices high and storage additions low. As with heating oil, natural gas inventories are now low, down about 15 percent from last year's level. This will be hard to fix before winter because the current ability to increase production rapidly is limited – ironically due to low prices in 1998 that discouraged field development in the face of substantial production decline rates. Gas markets, like those for heating oil, have responded. The natural gas spot price has been high all summer and now stands at $4.74 per million BTUs, up over 85% from last year, and futures contract prices are similarly high.[14]

With natural gas and heating oil stocks low and winter looming, traders warn of even higher heating fuel prices to come. Electric power reserves remain thin. In San Diego, a tripling of electric power prices has already led to price caps in the wholesale market and plans for retail rate relief. Consumers, having weathered a tough summer, are screaming, "Enough," and energy has become a heated topic in the national political dialogue.

AVOIDING THE FRYING PAN AND THE FIRE

What should be done? First, it is important to understand the nature of the problem and avoid unwise actions. Some elements of current energy market volatility are transient and will pass if markets are allowed to work. Natural gas development, for example, should be spurred by high prices so that these should fall over time. Where electricity deregulation has yielded high prices, much new generation is on the drawing boards. The question is will we "debottleneck" operation of the market by facilitating siting and permitting of



this price-relieving capacity or, instead, create debilitating investment uncertainty. The relatively rapid adjustments that mitigated the recent Chicago/Milwaukee gasoline price spike demonstrate that markets will work if allowed to. Spiking prices are generally a market distress call to both suppliers and customers, and it is important that both behave accordingly by supplying more and consuming less until the crisis is past. This is how commodity markets operate, and ill-considered price limits and punitive charges of conspiracy only undercut a legitimate economic mechanism, both retarding rational consumer response and discouraging supplier involvement and investment.[15] Even where markets will self-correct, however, there may be a need to intervene to address hardships that, while temporary, are nonetheless severe. Such is probably the situation with heating oil in the Northeast this winter, for example. Here the challenge is to deliver relief to those who really need it while disrupting price-relieving market responses as little as possible.

Other aspects of the energy problem are not transient in nature. OPEC, as long as it can maintain its internal cohesion, is likely to retain control over marginal petroleum resources, and, hence, influence over oil prices. Cartel members hold about 70% of proven reserves, and these are the least costly to develop. As demand expands, OPEC will enjoy increasing market share and dominance. Restructuring in the electric power industry has been very uneven. Twenty-four states have undertaken steps in the direction of competition, and these have often been inconsistent. Newly developed transmission organizations and power exchanges have left room for gaming and the exercise of market power. Uncertainty and regulatory ambiguity have retarded needed investment in generation and transmission. New generation will certainly help matters, but less tractable weaknesses in infrastructure and market process must also be addressed.[16] EPA's disjointed approach to air quality requirements for fuels is raising the risk of refinery investments just when investment is sorely needed. Refinery and electric generation investment are further inhibited by the confusion sown by EPA's recent aggressive enforcement of New Source Review permitting requirements for past maintenance activities. In these areas, patience will not bring solutions; action is required.

A MORE COMPREHENSIVE VIEW

As noted above, quick action may lead to mistakes, but the list of potentially constructive steps is nonetheless lengthy. Here are a few to be considered:

• Demonstrate willingness to use the Strategic Petroleum Reserve to moderate impacts from OPEC actions. A release from the SPR would alter the psychology of the market and let OPEC price hawks see we mean business.[17] At the same time, get to work on a long-term accommodation with OPEC. Both sides need stability and prices high enough to justify development of oil supplies but low enough not to cripple growth in established economies. There is a middle ground, and we need to find it.

• Focus more attention on consumers and less on harassing suppliers. Many of the solutions needed are on the demand side. Energy prices and environmental impacts both decline as consumption falls. Bidding systems for such things as electric power approach competitive expectations much more readily when consumers in addition to suppliers are allowed to respond to prices. Price volatility comes with competition and commodity markets. Electric power, natural gas, and petroleum product consumers should be educated and informed about how to manage price risk. Energy consumers need to know that in the new energy markets price volatility is a fact of life, and what goes down for a while is likely to come back up.

• Get EPA to work realistically and collaboratively with the refining, auto, and utility industries. Everyone wants to breathe clean air, drive their cars, and cool their homes. Achieving this in a growing economy will require considerable time and investment, even if accomplished very efficiently. EPA must work with industry to develop a comprehensive plan of attack that allows a feasible pace of compliance coupled with a reasonable degree of certainty and orderliness. If this does not happen, needed energy infrastructure investment will not be forthcoming. Issuing waivers of regulations already implemented is problematic because it penalizes those who have invested to comply; however, a moratorium on further implementation of air quality and fuel requirements might make a lot of sense while dialogue is established among the necessary participants in a solution process.

• Promote a more uniform and rational process of deregulation of the electric utility industry. Lack of consistency and uncertainty as to the scope and timing of deregulation are retarding both investment and the development of the institutions needed to rationalize power markets. Obviously, this runs afoul of a tradition of treating such problems at the state level, but the development of large regional entities and the advancement of technology and markets requires a more comprehensive approach if we want an orderly, even remotely efficient, transition process. Lots of capital is at stake, the potential disruptions from miscues are large, and there are several very thorny problems to solve. Since this is uncharted territory, further mistakes are probably unavoidable and some experimentation may be necessary, but a more comprehensive, considered approach would almost certainly ease the transition.

• Undertake a serious review of patent policy. The Unocal patent privatizes rights that should be in the public domain. In being the first to state the obvious, Unocal's intellectual contribution does not merit the exclusionary value granted. Rather than facilitating the improvement of air quality in California, the current royalty rate set for the patent actually undercuts compliance. Refiners must now invest literally billions to meet RFG mandates and pay a competitor for the right to do so. This raises the cost of compliance and reduces the likelihood that objectives will be met in a timely manner.

CONCLUSION

The serious problems now seen in energy markets have been building for some time. They will not go away immediately. They can, however, be moderated if we act realistically and prudently now and have a bit of patience as we struggle to establish new competitive markets.

ENDNOTES

1 The roots of the problem obviously go back further to deregulation of the electric power and natural gas industries, to passage of the Clean Air Act, and, indeed, to the formation of OPEC.

2 Crude prices rose from $10.90/bbl on March 10, 1999 to $33.92/bbl one year later.

3 Crude oil futures for July closed at $32.95 on June 15th, and as of June 28th, following the announcement of increases approved in OPEC's June meeting, the near month (August) contract closed at $32.06.

4 The national average price reported by DOE for all grades of gasoline increased from $1.148/gal in the week of June 14, 1999 to $1.664/gal in the week of June 12, 2000. In PADD II, where Chicago and Milwaukee are located, prices jumped from $1.114/gal to $1.826/gal.

5 In PADD II RFG prices went from $1.164/gal for the week of June 14, 1999 to $2.012 the week of June 12, 2000, an increase of nearly 73%.

6 As of June 12, 2000 gasoline inventories stood 10.7% below a year ago. On a days-of-supply basis the reduction in stocks over the year has been about 16.5%.

7 See statement of John Cook, Director, Petroleum Division, EIA, before the Committee on Energy and Natural Resources, U.S. Senate, July 13, 2000. (http://www.eia.doc.gov/pub/oil-gas/petroleum presentations/2000)

8 One of Unocal's patents has withstood legal challenge through the appellate level, and challengers of the patent have petitioned the Supreme Court.

9 On June 13th, the California ISO, which manages power transmission in California, issued a power alert, urging conservation in response to high, weather-driven electricity demand. On the 14th, it ordered implementation of load curtailments in order to avoid a major system disruption. New York's hot day occurred on June 26th and is reported in The New York Times of June 28th.

10 Power systems in New York and New England have also experienced difficulties and would be severely challenged by hot weather.

11 High demand for diesel and jet fuel for summer travel will also limit stock build of heating oil.

12 Distillate stocks in early June were down 21.5% from a year ago on a volume basis and 32.3% on terms of days-of-supply. As of August 28, supplies were down 21.6% and 27.2% respectively. Oil & Gas Journal website at http://ogj.pennet.com.

13 The Wall Street Journal, September 1, 2000.

14 The Wall Street Journal, September 1, 2000.

15 This is not to say that there is never a conspiracy or excessive opportunism behind high prices, as is evident later in the discussion.

16 It has been recognized in California, for example, that new generation alone will not solve the problems seen recently in electric power markets.

17 It would also deprive Iraq, a potential wild card in the OPEC deck, of political leverage.

The Brattle Group's Affiliation with Simon Terry Associates

The Brattle Group recently formed an affiliation with Simon Terry Associates Limited in Wellington, New Zealand. Simon Terry Associates is managed by Simon Terry, who has consulted on many of the economic and regulatory issues surrounding deregulation of the New Zealand gas industry. He has also consulted extensively on issues arising from deregulation of the electricity and water industries and has initiated and directed the research for a series of all party industry reform groups. Prior to starting Simon Terry Associates, Mr. Terry worked as an investment banker on state sector restructuring and privatization and as an award-winning financial journalist. He holds a degree in chemistry from Victoria University.

Geoff Bertram is a partner in Simon Terry Associates and has been a member of the Victoria University of Wellington economics faculty since 1976. He specializes in energy utility economics, in particular development economics and macroeconomic modeling. Dr. Bertram was also a member of the Minister of Energy's advisory group from 1990 to 1997. He has consulted extensively on issues arising from deregulation of the gas, electricity, and water industries and is the author of numerous journal articles and conference papers on energy and climate change issues. Dr. Bertram holds D.Phil in economics, M.Phil from Oxford University, and a B.A. Hons from Victoria University.

Recent *Brattle* Publications

Members of *The Brattle Group* have recently published several articles on topics of interest to energy specialists.

- Third Oil Shock: Real or Imaginary? Consequences and Policy Alternatives
- Option Pricing in a Price Spike World
- Residual Obligations Following Electric Utility Restructuring
- Deregulation and Monitoring of Electric Power Markets

If you would like a copy of any of these articles, please contact us at publications@brattle.com.

The Brattle Group's Newsletter Series

Our newsletter series includes the:

- ENERGY newsletter, which discusses current issues in energy markets and regulation;
- ECONOMICS newsletter, which focuses on current topics in economic litigation and strategy, such as the estimation of patent damages; and
- ENVIRONMENT newsletter, which reports on issues in environmental litigation.

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Next Issue: LIBERALIZATION OF EUROPEAN GAS MARKETS

Our next issue will discuss the key insights in a new report commissioned by the European Commission Directorate-General for Energy and Transport, which focuses on measures required to prevent discrimination in providing access to transmission and distribution networks.

The Brattle Group

44 Brattle Street
Cambridge, MA 02138-3736
Voice 617.864.7900
Facsimile 617.864.1576

1133 Twentieth Street NW
Washington, DC 20036-3408
Voice 202.955.5050
Facsimile 202.955.5059

5th Floor 8-12 Brook Street
London W1Y 1AA
Voice (0207)491.0843
Facsimile (0207)491.0846

email office@brattle.com   www.brattle.com