

Energy Arbitrage: A Market Imbalance That Could Transform Entire Industries

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Executive Summary

In the last five years, the spread between oil and natural gas prices has materially widened, in what looks to be a persistent shift in a critical market relationship. We believe that this price gap may persist for a period of years due to 1) a tight global oil market fueled by growing demand from emerging markets, 2) continued instability in the Middle East and 3) advances in extracting natural gas from shale. The effects are potentially far-reaching across a value chain that touches industries including energy, utilities, chemicals and transportation, not to mention geopolitics. From an investment perspective, we see opportunities in energy services, pipelines, and petrochemical producers, especially in North America.

The Opportunity

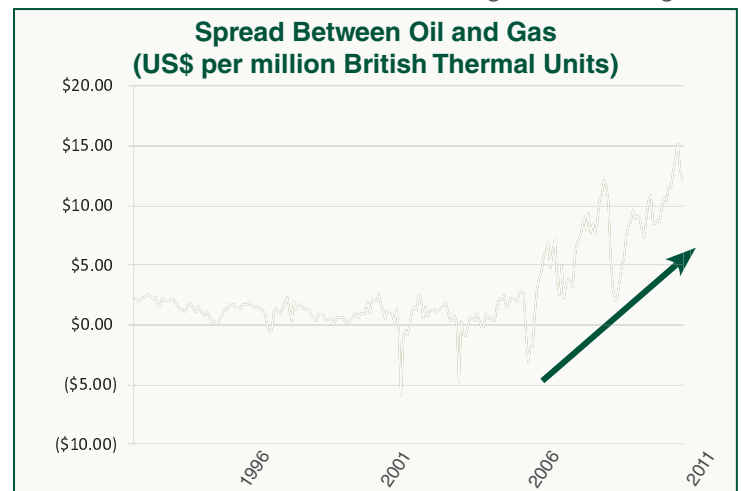
An arbitrage opportunity occurs when the same item is available for sale at two different prices. The arbitrageur profits from such an opportunity by buying low and selling high. Typically, arbitrage opportunities are short-lived as markets adjust quickly to close the price gap. However, at Roosevelt, we have identified a price gap in a major North American market that has steadily widened over the last five years and which may persist for many years to come.

We are referring to the differential, or “spread” between crude oil and natural gas, measured in price per unit of energy, a relationship depicted in the following chart (see Exhibit 1). From 1991 to 2005, this spread generally held steady, averaging about \$1. Since 2006, it has transitioned to an upward trajectory, and stood at \$12 at the end of June.

Numerous factors have driven the change in spread behavior. Crude oil moved higher as demand growth from emerging markets eroded excess capacity, tightening the global market balance.¹ More recently, the Arab Spring movement introduced a geopolitical

risk premium into crude pricing, by elevating concerns about market access to critical supplies in Saudi Arabia, as that nation engages in proxy battles with Iran over influence in the broader Middle East. The most important driver, though, has been the emergence of shale as a significant source of natural gas supply, enabled by the use of new production technologies in these unconventional resource plays. In recent years, shale has transformed the domestic natural gas industry from a state of decline to accelerating growth in both production and reserves. Without the link to global markets that has supported crude oil, domestic gas prices are depressed by this unanticipated excess supply.

The recent dramatic increase in proved natural gas reserves depicted below (see Exhibit 2) is virtually all due to the shale plays. For example, in 2009, the latest year available, total natural gas reserves increased by 28 trillion cubic feet, with shale-derived gas constituting



Source: Roosevelt Investments. The spread is the cost of 1 million BTU delivered via oil, less the cost of the same energy content delivered via natural gas. It is based on the spot price for delivery of West Texas Intermediate crude oil at Cushing, Oklahoma and the spot price for delivery of natural gas at Henry Hub in Louisiana, sourced from Bloomberg. One barrel of crude is assumed to contain 5.8 million BTU, per the Energy Information Administration.

SHALE GAS

Geologists have long known about the natural gas trapped in U.S. shale that was formed in the Paleozoic and Mesozoic eras. However, accessing this resource did not become economical until the development of new drilling techniques and increases in natural gas prices. Drilling techniques include: horizontal drilling, which exposes more gas-rich shale to the well; hydraulic fracturing, or pumping water and propellants into the well to stimulate production; and multi-lateral completion, or applying hydraulic fracturing to sections of the well in sequence. A typical shale well today would include 3,000 to 6,000 feet of horizontal drilling with hydraulic fracturing stages every 500 to 700 feet, although some operators have drilled up to 10,000 feet and used up to 40 stages per well. Each year we are seeing more efficient production as use of these techniques becomes more refined, which is driving more investment into the shale plays, even at low natural gas prices.

The principal shale gas plays in the U.S. today are the Barnett (Texas), Haynesville (Louisiana and Texas), Fayetteville (Arkansas), Woodford (Oklahoma), Marcellus (Pennsylvania) and Eagle Ford (Texas). These plays make up 94% of U.S. shale-derived natural gas proved reserves.² Environmental concerns have been raised as to the effects of shale gas production on area water quality, especially with regard to the use of propellants in hydraulic fracturing, most notably by the 2010 documentary *Gasland* and the *New York Times*.³ While federal and state regulation in this area is evolving, we do not expect additional costs imposed on the operators to materially impact the industry's overall ability to grow reserves and production in the coming years.

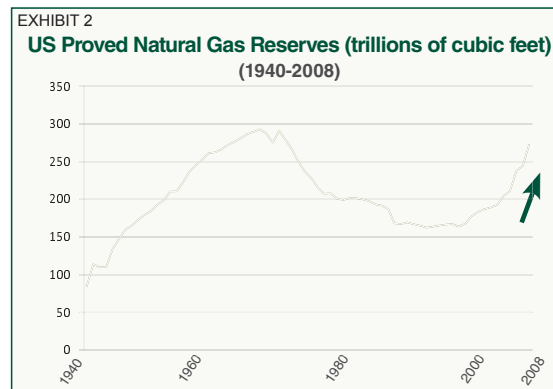
26 trillion cubic feet, or 93% of this growth.²

Each of these factors - the tight global oil market, the Middle East regional conflict, and the U.S. shale gas supply - is likely to persist for many years. In turn, it is reasonable to expect the spread between oil and gas to remain elevated for a sustained period.

Roosevelt Investments' Approach

How does Roosevelt Investments seek to turn this opportunity into an investment strategy? Generally speaking, we select our investments after identifying economic, political, social, demographic and industry-specific undercurrents that can be translated into long-term investment themes. "Energy Arbitrage" is one such theme. Once we have identified a theme, we conduct research and apply fundamental financial analysis in order to identify companies that we believe are positioned to benefit from the shift. We also look for secondary and tertiary players that stand to benefit from the ripple effects caused by social, demographic and economic changes.

In the case of energy arbitrage, industries that source energy from natural gas and deploy it in markets where pricing is based on crude oil will successfully capture the spread. Therefore, to identify the beneficiaries we must follow the gas from the shale (upstream), through processing and pipelines (midstream) to its end use (downstream) - that is, consider the entire value chain.



Source: Bloomberg and Energy Information Administration.

Upstream access to shale gas requires ownership or leasehold rights to the reserves, access to specialized equipment, and the capability to apply the production technology. In the current environment, a key differentiator among reserves is the presence of natural gas liquids. Exploration and production companies whose rights are concentrated among liquids-rich deposits are advantaged because they may improve the economics of the well such that it can deliver solid returns even at very low natural gas prices.

Natural Gas Liquids (NGL) occur naturally in gas deposits with varying degrees of concentration. They are most prevalent in certain shale plays, including the Bakken (North Dakota), Eagle Ford (Texas) and the southwestern Marcellus (Pennsylvania).⁴ The most common NGLs co-produced with shale gas are ethane, propane, butane and pentane.⁴ Chemically, NGLs are hydrocarbon chains that are longer than natural gas but shorter than crude oil. They are used as petrochemical feedstock and as fuels for heating, cooking and transportation. Given their composition and uses, NGLs are a substitute for refined crude oil, and their pricing is linked to crude oil rather than natural gas.

With production tied to natural gas (abundant), but pricing tied to crude oil (scarce), NGLs are a play on the oil-gas spread.

As such, each segment of the natural gas value chain is likely to be advantaged to the extent it touches this market, for as long as the oil-gas spread remains at elevated levels.

As one might expect, energy services companies who can deliver the new drilling technologies to unlock the promise of the shale plays are well positioned. The chart below (see Exhibit 3) illustrates the dominant role that horizontal drilling has quickly come to play in the U.S.

NATURAL GAS LIQUIDS

Natural Gas Liquids occur naturally in gas deposits with varying degrees of concentration. They are most prevalent in certain shale plays, including the Bakken (North Dakota), Eagle Ford (Texas) and the southwestern Marcellus (Pennsylvania).⁴ The most common NGLs co-produced with shale gas are ethane, propane, butane and pentane.⁴ Chemically, NGLs are hydrocarbon chains that are longer than natural gas but shorter than crude oil. They are used as petrochemical feedstock (i.e. building blocks to produce plastics and other synthetic materials) and as fuels for heating, cooking and transportation. Given their composition and uses, NGLs are a substitute for refined crude oil, and their pricing is linked to crude oil rather than natural gas.

With production tied to natural gas (abundant), but pricing tied to crude oil (scarce), NGLs are a play on the oil-gas spread. As such, each segment of the natural gas value chain is likely to be advantaged to the extent it touches this market, for as long as the oil-gas spread remains at elevated levels.

We believe a secondary beneficiary within energy services are those who deal with the waste stream of shale gas production, including recovery, recycling and disposal of the fracturing fluid. Environmental regulation of this process is expected to become more onerous⁵, and service providers who can stay abreast of changing requirements will be advantaged going forward.

In the midstream, natural gas may be gathered, fractionated, or stripped of its liquids content, stored, and ultimately transmitted via pipeline to its end use markets. This area is interesting for several reasons. First, the existing midstream infrastructure was primarily built for access to conventional gas basins rather than the newer shale plays. This puts a premium on any assets already deployed in proximity to shale gas. It also creates opportunity for new investment at relatively high returns with a significant degree of safety, because well operators are willing to provide long-term guarantees in advance of construction in order to secure the capacity to handle anticipated production growth. As before, there is an advantage to liquids exposure, most notably in processing operations, which contractually participate in the proceeds from NGL sales, thereby gaining direct exposure to the oil-gas spread. In the pipeline and storage areas, direct commodity exposure is limited, but the elevated spread

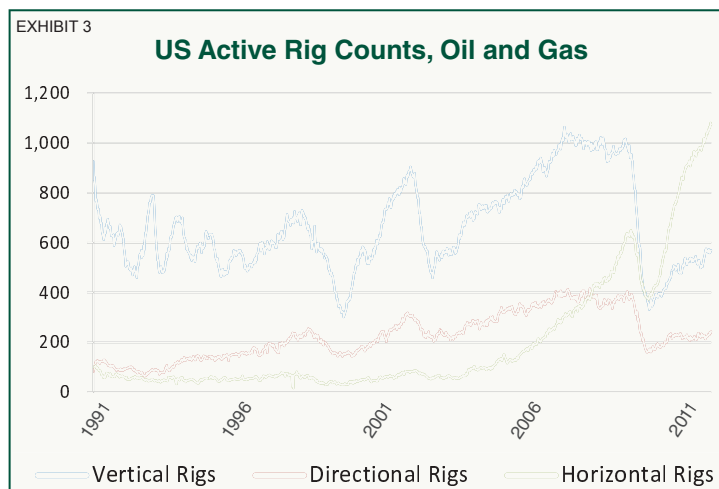
is driving volume growth as other market participants seek to capture the arbitrage opportunity.

From an equity markets perspective, more limited commodity exposure may actually be an advantage to the pipelines, which will see growth from volumes and new capital projects, without the risk of a material earnings impact on any moderate narrowing of the spread. For this reason, we view the pipelines as “growth utilities” offering the stability of regulated, non-discretionary offerings together with the prospect for accelerating business growth, reminiscent of the electric utilities in the post-World War II period as the U.S. built out its electric grid.

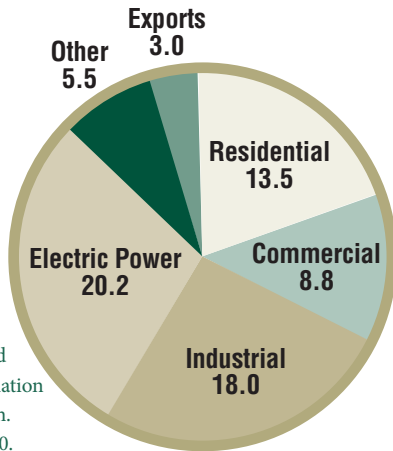
Downstream gas is used primarily for home and commercial heating, and electric power generation, as shown on the next page (see Exhibit 4). Gas is likely to gain market share over time, particularly in power generation, as environmental and safety regulations raise the cost to operate competing coal and nuclear power plants.⁶ Ultimately, this should advantage gas-fired plant operators.

In addition, energy arbitrage is transforming the petrochemical industry. In the last decade, Middle Eastern producers have gained market share in the supply of plastics, leveraging their access to low cost energy and feedstock.

However, North American plants are equipped to use natural gas as energy and natural gas liquids as feedstock; for example, ethane may be processed into polyethylene. Thus, the widening oil-gas spread has advantaged North American producers, who are re-asserting themselves in this market.⁷ Future production from international shale plays



Source: Bloomberg and Baker Hughes, Inc.

US Natural Gas Demand (billions of cubic feet per day)

Sources:
Bloomberg and
Energy Information
Administration.
Data is for 2010.

EXHIBIT 4

could eventually level the playing field, but presently North America is enjoying a considerable first-mover advantage. Moreover, a robust industry picture driven by strong demand from emerging markets and an increasing focus on delivering higher value specialty products makes this a lucrative area for investment, in our opinion.

Also of interest are potential future applications for natural gas which could be enabled by the wider oil-gas spread. For example, Compressed Natural Gas (CNG) as a transportation fuel has enormous growth potential off of a very small base. It is most suitable for heavy duty trucks, including specialty fleet vehicles, and has been tested for years by operators in parcel⁸ and waste management⁹, for example. Adoption beyond fleet vehicles would require a distribution infrastructure, which is unlikely to develop without a government subsidy that seems politically untenable at this point. However, fleet vehicles with regular routes that return to the same location after use can adopt this technology without massive investments in distribution. CNG costs less and burns cleaner than diesel, and it would reduce U.S. dependence on foreign oil.

There is also potential for the U.S. to develop a Liquefied Natural Gas (LNG) export market. Prior to the improvement in shale economics, when domestic production and reserves were in decline, LNG import terminals were constructed in the U.S. to satisfy anticipated future demand. Now, these terminals could be retrofitted to expand the nation's export capacity. In the European and Asian markets, LNG pricing is linked partially or wholly to crude oil, enabling U.S. exporters

to capture the oil-gas spread. U.S. shale gas exported as LNG could reduce European reliance on Russian gas supplies and also help Japan deal with its nuclear generation capacity losses.

Finally, gas-to-liquids production, or conversion of natural gas to diesel fuel and other refined products, is another possible means to capture the spread. The current generation of technology suffers from high capital costs and low production efficiencies, but incentives have never been greater to develop next-generation technology in this area.

Putting it into Practice

At Roosevelt, we have structured our portfolios to take advantage of the energy arbitrage theme by investing in those companies positioned to benefit from the various market dynamics detailed above. Our holdings include:

- ▶ Major owners and operators of midstream processing and pipeline assets
- ▶ Gas utilities with substantial resource holdings in shale plays
- ▶ Waste management companies that provide environmental services at well sites
- ▶ A chemical manufacturer that leverages domestic natural gas/NGLs to compete globally
- ▶ An inland barge operator that transports petroleum-based liquids and also services engines and other equipment used in shale-based oil and gas production
- ▶ An oil tanker operator with a specialty liquefied natural gas transportation fleet

In summary, the persistent widening of the spread between oil and gas is creating enormous new markets across a variety of industries. Through our emphasis on thematic investing, we are focused on identifying undervalued securities that we believe stand to benefit as companies capitalize on the energy arbitrage opportunity.

About the Author

Jason Benowitz, CFA, joined Roosevelt Investments in 2009 as a Securities Analyst and in 2011 was promoted to Portfolio Manager. Prior to Roosevelt, Mr. Benowitz was a principal at Druker Capital, a long/short hedge fund manager, and a Vice President in the U.S. Equity Research Group at Morgan Stanley Investment Management. He was also an investment banking analyst at Merrill Lynch. Mr. Benowitz earned a BA in Computer Science from Harvard College and an MBA in Finance and Accounting from The Wharton School at the University of Pennsylvania, where he was a Palmer Scholar. Mr. Benowitz received his CFA charter in 2010.

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