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MLP Investing:

The Impact of the Natural Gas Megatrend on Energy Infrastructure

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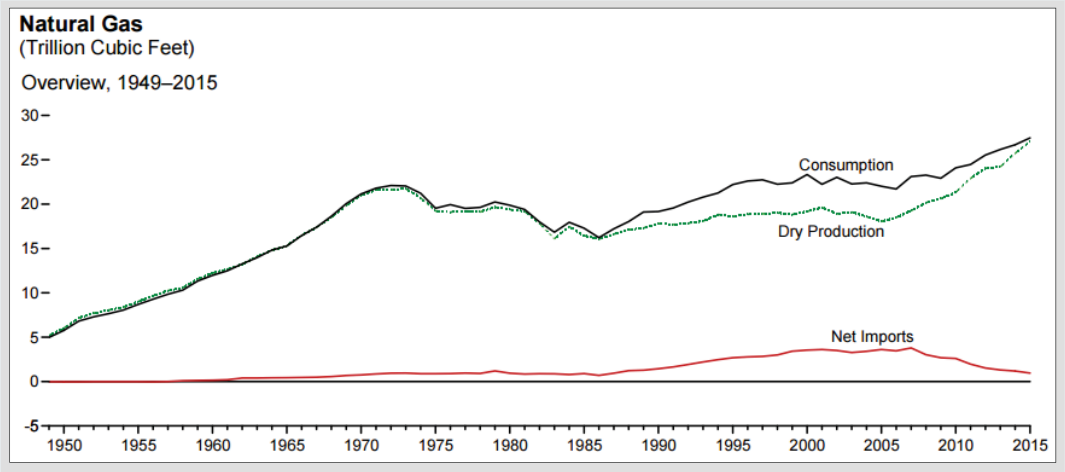
U.S. Shale Revolution

Much has been made of the impact of the U.S. Shale Revolution on global markets for crude oil. The 45% increase in U.S. crude production from 6.6 millon barrels per day (mbpd) in 2006 to 9.4mbpd in 2014 resulted in a landmark decision by Saudi Arabia to abandon its long held policy of balancing output to sustain crude prices. Fearful of losing market share to U.S. shale production, the Saudis instead unleashed more production in the face of falling prices in an attempt to squeeze higher cost U.S. producers out of the market. This highly publicized price war resulted in a decline in WTI crude prices from $114 in July 2014 to a low of $26 in February 2016.

Less discussed has been the impact of the shale revolution on natural gas production and prices. The emergence of fracking technology has unleashed an abundance of supply that has driven the cost of natural gas down 80% in the U.S. since 2005. This has made natural gas an abundant, inexpensive, and relatively clean fossil fuel for use in power generation, U.S. manufacturing, and the petrochemical industry. It is anticipated this trend will continue as the U.S. replaces coal consumption with natural gas consumption. This trend is driven both by economic forces (cheap gas) and by environmental forces (cleaner than coal). This trend has been labeled by many a "Megatrend" with positive implications for the U.S. economy through job creation, abundance of cheap energy, and energy independence.

History of U.S. Natural Gas Production and Prices

From 1930 to 1969 U.S. dry natural gas production rose tenfold from 1.9 million cubic feet (MMCF) to 19MMCF per year. Production essentially went sideways from 1968 to 2006. That all changed in 2006 with the beginning of the U.S. Shale Revolution. By 2015, production of dry gas in the U.S. hit a record of 27MMCF, a 46% increase over 2006 or the "pre shale" level.

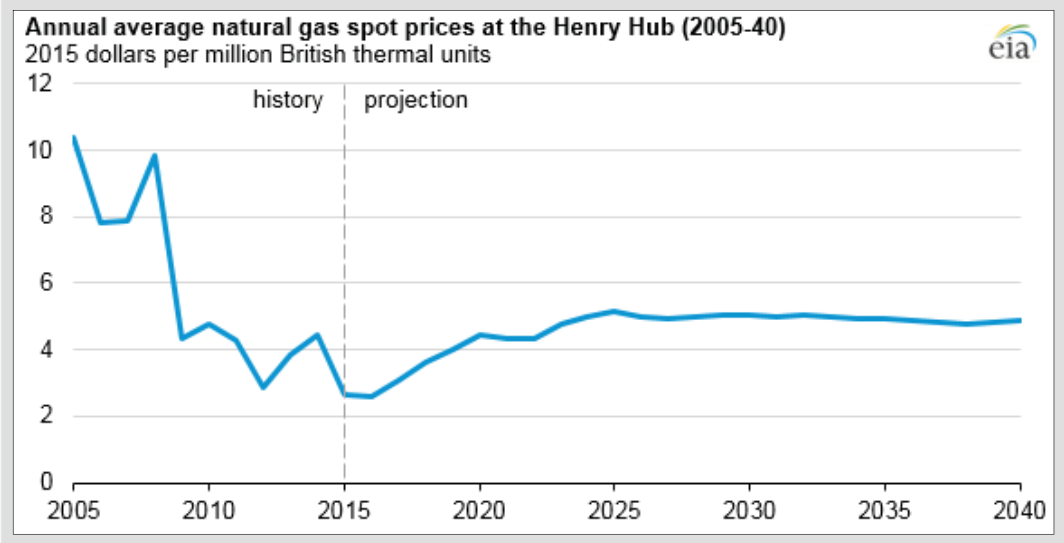


Source: U.S. Energy Information Administration, Monthly Energy Review, March 2016

Unlike crude oil, which trades on world markets and is subject to global supply and demand, natural gas in the U.S. was historically a "trapped" market. The U.S. has historically produced over 80% of its consumption needs with the rest

coming from imports. When the price of U.S. produced natural gas exceeded $10 (adjusted for inflation) in 1982, the U.S. entered a period of reduced domestic production that lasted nearly two decades. Due to higher prices, demand for natural gas declined in the U.S. For much of the 1980s and 1990s, coal was the fuel of choice for electric utility generation. The petrochemical industry experienced an exodus from the U.S., and certain manufacturers moved overseas.

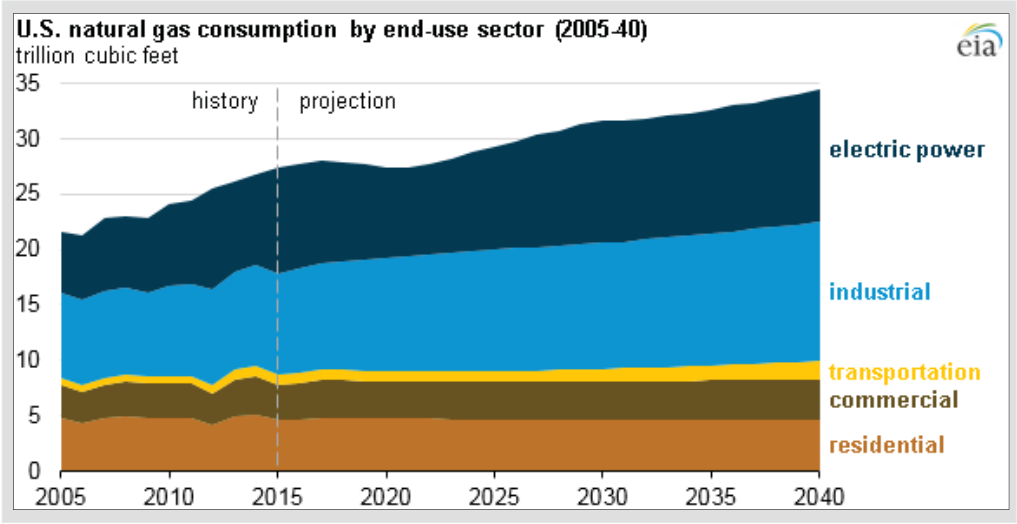
The advent of the shale revolution changed all of that by unearthing vast quantities of previously trapped gas below the continental U.S. As shale production took off, the price responded. As a direct result of the tenfold increase in production, prices fell in the U.S. from $10 per million british thermal unit (BTU) in 2005, to $2 per million BTU today.



Source: U.S. Energy Information Administration, Annual Energy Outlook 2016

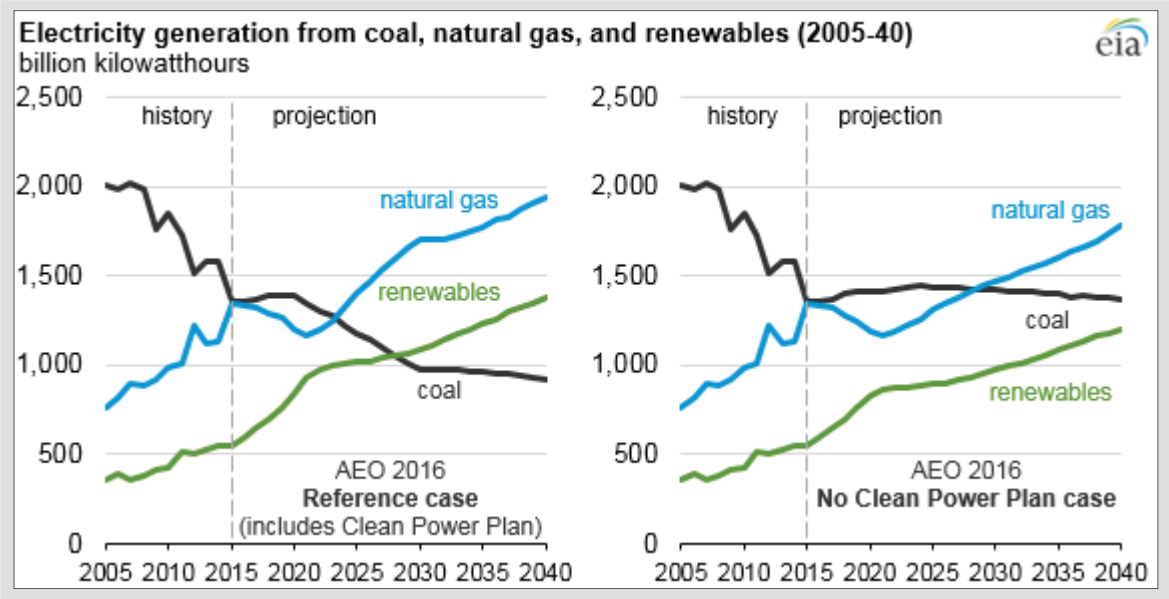
Low Prices Spur Demand

The response to this 80% decline in the price of natural gas has been both predictable and powerful. While consumption for residential, commercial and transportation have shown modest growth over the past ten years, the growth in consumption for electrical power and industrial uses has grown rapidly. It is expected this trend, supported by inexpensive and cleaner burning natural gas, will continue.



Source: U.S. Energy Information Administration, Annual Energy Outlook 2016

In 2005 the U.S. produced 65% of its electricity from burning coal, 24% from natural gas and 11% from renewables. In 2015 those numbers changed to 40% coal, 40% natural gas, and 20% renewables. The EIA projects that by 2040 the U.S. will generate almost half its electricity by burning natural gas, while the renewables share grows to 33% and coal falls to 18%. In addition to the economic benefits, replacing coal with natural gas is expected to play a large role in compliance with the Clean Power Plan which takes effect in 2022.



Source: U.S. Energy Information Administration, Annual Energy Outlook 2016

The use of cheap natural gas is not limited to power consumption. It is a critical petrochemical feedstock that's used to make everything from fertilizer to plastic and it has long been used to heat U.S. homes and businesses. Adoption of diesel fuel is slow but steady. Finally, demand for American gas isn't just domestic with an increasing amount of gas projected to be exported.

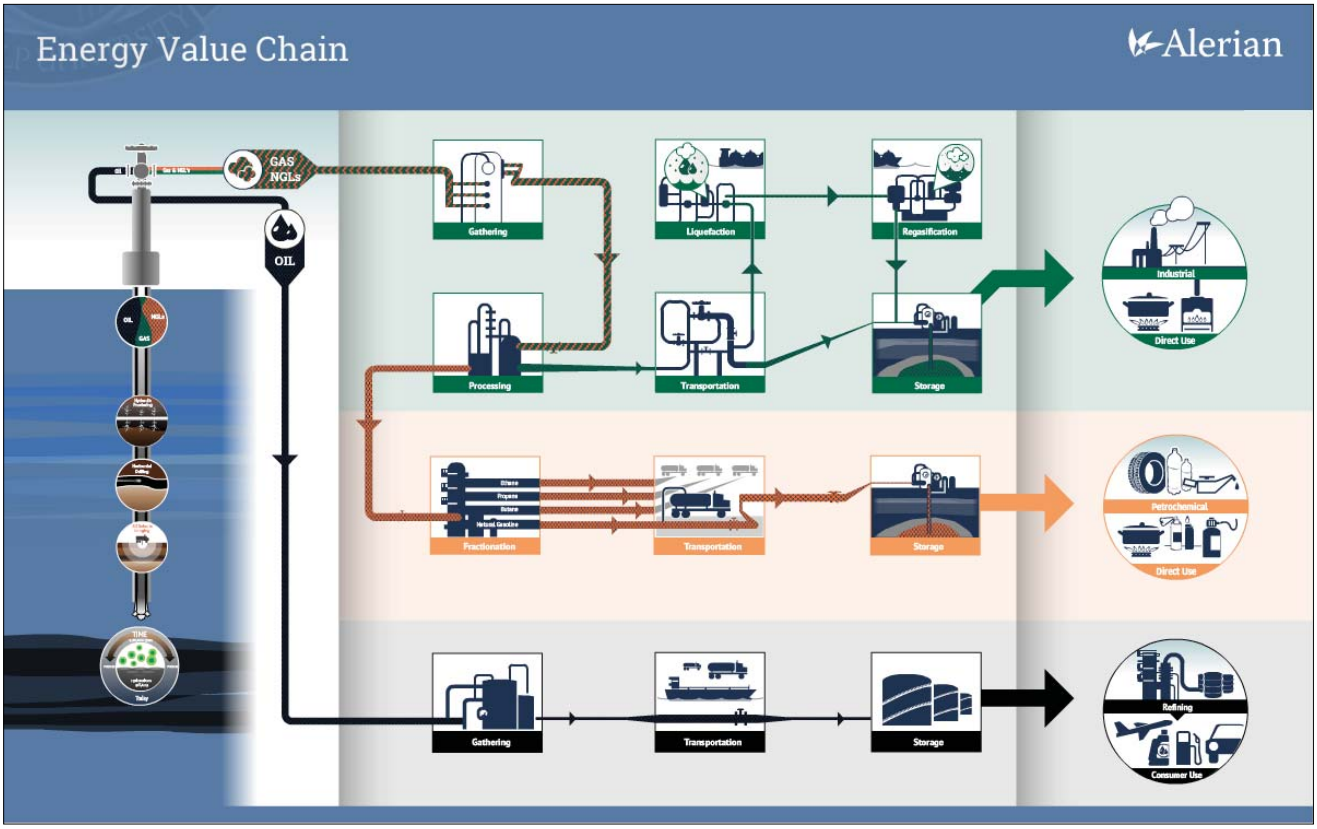
The U.S. Begins to Export Natural Gas

As recently as 2005, the U.S. imported 20% of the natural gas needed for consumption. The sharp increase in domestic production has positioned the U.S. to now become a net exporter—something unthinkable ten years ago. Low cost natural gas, political stability, and geographic access to the major LNG consumers give U.S. sourced LNG competitive advantages globally. Earlier this year, Cheniere Energy's Sabine Pass Facility on the Gulf Coast became the first to export Liquid Natural Gas (LNG) from U.S. shale fields. After Qatar and Australia, the U.S. could become the world's third largest LNG exporter by 2020. The U.S. Department of Energy has approved projects that may send as much as 10 Bcf/day abroad and is considering applications for another 35 Bcf/day. (Source: Forbes). U.S. LNG exports are being called "the Most Powerful Demonstration of U.S. Geopolitics in Decades," helping to give the power to buyers in negotiations.

The Need for Infrastructure

The increase in production and consumption of natural gas has led to an increased need for midstream natural gas services. Increased exports of LNG require storage, transportation, and liquefaction services as well.

Midstream services for crude oil are quite simple. Crude comes out of the ground, is gathered and either transported or stored and then transported to a refinery. By comparison, midstream services for natural gas are complex, involving more processes, touch points, and a myriad of end use customers. Natural gas and natural gas liquids (NGLs) must be gathered from the well head. From there, a processor separates the dry gas from the NGLs. NGLs are transported through a system resulting in potential processing into components and further storage, and then sent to export terminals, refineries or chemical plants. Dry gas is transported and stored through separate systems before heading to market.



Source: Alerian

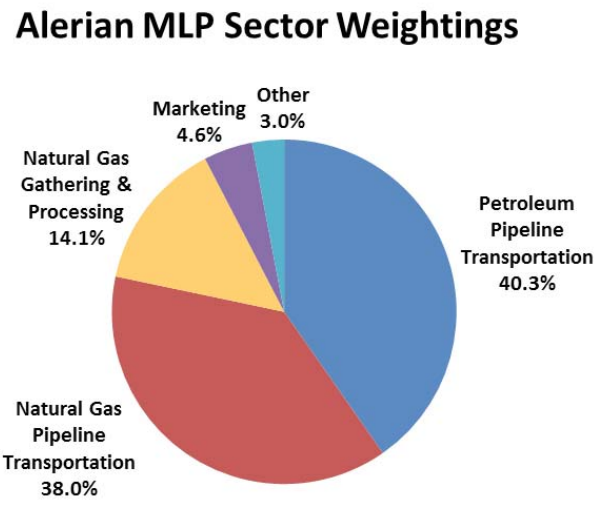
All of these steps in the gas and NGL transmission and processing chain will require significant additional infrastructure in the decades to come.

The INGAA estimates the U.S. will spend $313 billion for natural gas infrastructure between 2014 and 2035, or about $14.2 billion per year. Much was invested between 2010 and 2014 for gas transmission mainline pipes; that number is declining over the next two decades. This has been offset by a larger projected need for LNG export facilities as the U.S. stands to become a net exporter of natural gas.

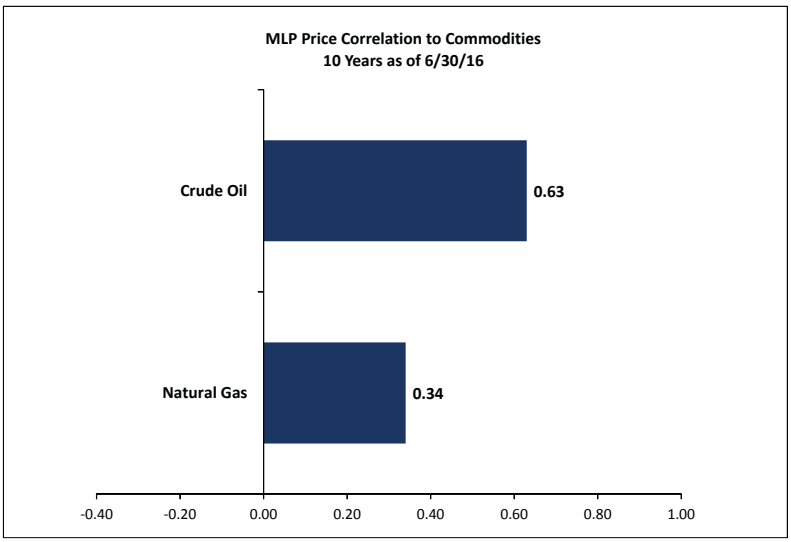
(Billions of Real Dollars)	2014-2035 (2012$)	Average Annual (2012$)
Gas Transmission Mainline Pipe	$87.2	$4.0
Laterals to/from Power Plants, Gas Storage, and Processing Plants	$45.2	$2.1
Gathering Line (pipe only)	$35.6	$1.6
Gas Gathering Line Compression	$23.5	$1.1
Gas Lease Equipment	$26.9	$1.2
Gas Pipeline & Storage Compression	$11.6	$0.5
Gas Storage Fields	$12.0	$0.5
Gas Processing Capacity	$27.4	$1.2
LNG Export Facilities	$43.7	$2.0
Total Capital Expenditures	**$313.1**	**$14.2**

Source: INGAA

The lions' share of this investment will come from energy infrastructure companies, some of which are structured as Master Limited Partnerships (MLPs), some of which are C-Corps. All are commonly referred to as "MLPs" and participate in the business of building and operating energy infrastructure. MLPs are often linked with commodity prices and most commonly with crude oil. Over half of the assets represented by the Alerian MLP Index are engaged in the natural gas business. About 40% are in crude oil or refined products from crude (e.g. gasoline, jet fuel).



Source: Eagle Global Advisors calculations



Source: Eagle Global Advisors calculations

During the rapid decline in crude oil prices from July 2014 through early February 2016, MLP prices also fell rapidly as the correlation between the Alerian Index and crude oil spiked. Over the past 10 years the correlation between MLP prices and crude oil has averaged 0.63, including a spike to over 0.90 during the crude oil sell-off. Correlations to natural gas prices have remained relatively low. This seeming disconnect presents an opportunity for investors interested in the Natural Gas Megatrend. While many large MLPs have a diversified business mix, five of the ten largest MLPs in the Alerian MLP Index are primarily in the natural gas business.

Alerian MLP Index Top 10 Constituents as of June 30, 2016

Company Name	Sector	Index Weight
Enterprise Product Partners (EPD)	Natural Gas Pipeline Transportation	20.5%
Energy Transfer Partners (ETP)	Natural Gas Pipeline Transportation	9.5%
Magellan Midstream Partners (MMP)	Petroleum Pipeline Transportation	9.0%
Plains All American Pipeline (PAA)	Petroleum Pipeline Transportation	5.5%
Buckeye Partners (BPL)	Petroleum Pipeline Transportation	4.8%
Williams Partners (WPZ)	Natural Gas Gathering & Processing	4.5%
MPLX (MPLX)	Natural Gas Gathering & Processing	4.4%
ONEOK Partners (OKS)	Natural Gas Gathering & Processing	3.3%
Sunoco Logistics (SXL)	Petroleum Pipeline Transportation	3.3%
Enbridge Energy Partners (EEP)	Petroleum Pipeline Transportation	2.6%

Source: Alerian

While MLPs have rallied lately, however prices remain well below their 2014 peak. The MLP sell-off in the past two years seemed to be primarily due to the steep fall in crude oil prices and a resulting decline in the growth trajectory of U.S. crude oil production. What the MLP market seems to be missing is the significant percentage of revenue MLPs derive from natural gas. An investment in a producer of natural gas brings a large dose of commodity price risk. An investment in MLPs provides investors the opportunity to participate in the Natural Gas Megatrend at prices that are still depressed without the commodity price risk associated with an investment in production.