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Before the
House Subcommittee on Railroads, Pipelines, and Hazardous Materials
On "How the Changing Energy Markets Will Affect U.S. Transportation"

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Mr. Chairman and Members of the Committee:

Thank you very much for the opportunity to testify before you this morning on recent developments in the energy markets and the outlook for energy transportation infrastructure. The Carlyle Group is one of the world's largest alternative asset managers firms, with \$203 billion in assets under management.

From an investment perspective, the domestic energy revolution has three related, but distinct layers:

(1) The first, and most obvious, is direct investment in energy resources and energy exploration and production (E&P) companies. These investments generally involve the purchase and development of acreage or mineral rights.

(2) The second layer involves investments in the infrastructure necessary to transport energy from where it is produced to where it is consumed. These investments can be direct investments in specific transportation or storage projects, or investments in businesses that operate in this space, such as utilities, pipeline companies, or railroad operators.

(3) Finally, investors may also seek to capitalize on the domestic energy revolution by investing in energy-intensive businesses. Specifically, investors can buy debt and equity in businesses where energy accounts for an especially large share of operating costs, or invest in

specific projects to add productive capacity or switch the business' fuel use towards cheaper domestic energy sources.

Carlyle is active in all three layers. Through our strategic relationship with NGP Energy Capital Management and through our Carlyle Energy Mezzanine Opportunities (CEMOF) fund, we intend to invest over \$7 billion to develop energy resources and invest in E&P companies over the next few years. Carlyle invests in energy infrastructure projects and companies that own energy infrastructure assets through our Carlyle Energy Mezzanine Opportunities (CEMOF) and Carlyle Power Partners (CPP) funds. Finally, Carlyle invests in energy-intensive businesses through our U.S. buyout and growth capital funds. Of special note, in 2012 Carlyle funds partnered with Sunoco to form Philadelphia Energy Solutions, which is the longest continuously operating oil facility in the U.S. – possibly in the world – and the largest oil refining complex on the U.S. Eastern seaboard. Since 2013, PES has undertaken a number of capital intensive projects to diversify oil supplies, reduce energy input costs, and improve efficiency. Foremost among these projects was a high speed unloading rail facility capable of receiving roughly 160,000 barrels of domestically produced crude oil per day.

Background

Over the last several years, investors' main focus has been on the first layer of the domestic energy revolution. Between 2009 and 2014, fixed investment in structures, facilities, and equipment necessary to develop oil and gas reserves accounted for 70% of *net* industrial investment in the U.S.¹ and reached an estimated \$245 billion in 2014, equal to 11% of total

¹ Carlyle Analysis of Federal Reserve, G.17.

nonresidential investment and 1.4% of GDP.² The boom in energy investment provided a major boost to the economy at a time when business investment growth in other sectors had been unusually subdued.³

The unexpected collapse in the price of oil has dramatically altered the outlook for energy-related investments. While most observers believe the equilibrium price of oil is well above the current spot price of \$45, there is considerable uncertainty regarding the timing of the upward price adjustment and its ultimate magnitude. That is because the price drop has complex origins and can be attributed, in part, to: (1) the decline in oil demand due to the slowdown in oil-intensive emerging market economies; (2) the dramatic increase in the supply of unconventional oil in North America; (3) the 10% increase in the foreign exchange value of the dollar, which has led to a decline in the market price of most dollar-invoiced commodities like oil, copper, iron ore, etc.; (4) a change in the reaction function of Saudi Arabian oil production, which had previously adjusted downward to maintain a higher market price; and (5) the decline in the size of Wall Street broker-dealer inventories, which has reduced liquidity in the \$730 billion market for energy-related corporate bonds and forced holders of these securities to hedge their exposure using short positions in oil futures.⁴ Currently, futures markets suggest that oil prices will only gradually rise to \$60 per barrel by the end of next year.

While the drop in the price of oil is likely to benefit the economy by increasing real incomes and reducing input costs in the transportation sector, it is almost certain to result in a sharp decline in E&P-related capex. Cash flows among E&P firms have been compressed and external

² Estimated from NIPA Table 5.3.5, Bureau of Economic Analysis.

³ Clare, P. and Thomas. J. (2014), "The Opportunities from Underinvestment," Economic Outlook, The Carlyle Group.

⁴ Bank of America Merrill Lynch, Global Index System Database, Accessed January 28, 2015.

financing costs have spiked. Credit spreads on energy-related high-yield bonds have doubled over the past year, suggesting the potential for significant default risk if prices remain at current levels. The price decline has also made much incremental development uneconomic, as the per barrel cost exceeds the current market price. In these circumstances, it would not be surprising to see a decline in capex proportional to the drop in oil prices that shaves as much as 0.5% off of U.S. GDP this year.

Current Outlook

Today, investors in the E&P space are more focused on identifying distressed companies than funding new resource development. With investments in new oil production likely to slow considerably, investors' attention is likely to shift to the second and third layers of the domestic energy revolution. While the optimum quantity of E&P investment tends to depend on the price of the energy resource, expected returns on investments in the second layer – “midstream” assets like pipelines, rail and barges, gas storage, and gathering systems – can be invariant to the market price of energy. For example, monthly returns on midstream Master Limited Partnerships (MLPs) have exhibited a lower correlation with changes in the price of oil than the overall S&P 500.⁵ And, of course, the expected operating profits of energy-intensive businesses are inversely related to the price of energy. In the absence of frictions, one would anticipate that fixed investment activity would move from resource development to energy transportation infrastructure and manufacturing.

⁵ Bloomberg, Monthly Returns over the five years ending January 28, 2015. When including upstream MLPs, the correlation is about the same as for the S&P 500.

As I said at the outset, the three layers of domestic energy investment are distinct, but ultimately closely related. It has become commonplace over the past several years for energy industry analysts in the public and private sector to produce reports forecasting startlingly large increases in domestic natural gas development. Implicit to all of these forecasts are trillions of dollars in investment in infrastructure, generation, and industrial facilities to transport, store, and burn the gas once it's extracted from the ground.

The most recent estimates from the Energy Information Administration (EIA) assume that domestic U.S. natural gas consumption will rise by 6 quadrillion BTU over the next 15 years.⁶ To achieve this increase, the EIA assumes that energy-intensive industrial production will grow by 53% in real terms over the next decade. This means that rather than declining as a share of U.S. GDP and energy consumption, as assumed four years ago, the industrial sector is now expected to account for all of the net increase in U.S. energy consumption over the next decade. For this forecast to be internally consistent, the EIA estimates that the most energy-intensive manufacturing subsectors – paper, chemicals, cement and stone, iron and steel, aluminum, and glass – will grow 26% faster than the economy as a whole through 2025.

This forecast is not fantasy; some of the industrial investment is already apparent. Over the twelve months ending in November 2014, construction of new chemical manufacturing plants increased by 70%.⁷ The increase in domestic chemical manufacturing capacity is tied to the multi-year decline in the price of natural gas liquids (NGLs), a key feedstock in the production of ethylene and other bulk chemicals. The decline in NGL prices has dramatically reduced the cost of producing bulk chemicals in the U.S., which has increased the expected returns per

⁶ Energy Information Administration, 2014 American Energy Outlook.

⁷ Census, Construction Survey, January 2, 2015.

dollar of installed capital and resulted in the aforementioned investment growth. The same dynamic is likely to take hold in other industries where energy accounts for a large share of output. The greater risk to the energy development forecast comes from potential roadblocks to infrastructure investment.

Streamline Permitting Process

To ensure the domestic energy revolution is sustained in this period of low prices, Congress should focus on enhanced transportation and storage infrastructure. Much of the new oil and gas produced in the U.S. is located in parts of the country bypassed by the existing energy infrastructure. These bottlenecks result in a fragmented market that imposes huge deadweight costs on the economy, as producers accept depressed prices, while utilities and industrial users in other parts of the country experience seasonal shortages and price spikes. An estimated \$650 billion to \$900 billion of fixed investment is required to connect new shale plays with existing energy infrastructure and build new pipelines and storage facilities to accommodate the growth in domestic energy production.⁸

Congress can accelerate the pace of this investment by streamlining the permitting process. A recent Government Accountability Office (GAO) report found that the regulatory review for the average interstate natural gas pipeline averages 558 days between pre-filing and certification.⁹ The process is so time consuming because of the number of federal, state, and local agencies involved, the differences in practices across states, and the absence of a single

⁸ The range represents results from “North American Midstream Infrastructure through 2035: Capitalizing on Our Energy Abundance,” ICF International, March 2014; and “Oil & Natural Gas Transportation & Storage Infrastructure: Status, Trends, & Economic Benefits,” IHS International, December 2013.

⁹ GAO, “Interstate and Intrastate Natural Gas Permitting Processes Include Multiple Steps, and Time Frames Vary,” GAO-13-221.

“lead” agency charged with coordinating the process. The federal government should take steps to expedite the review process without undermining any necessary environmental assessments.

For a firm that raises *ex ante* callable capital to invest in midstream opportunities, such delays can make otherwise attractive projects uneconomic. For example, consider a pipeline project with an expected two-times multiple on invested capital that would otherwise take three years to complete. Adding 558 days to this project would reduce its internal rate of return by 36%. The uncertainty created by the permitting process makes it harder for projects or operating businesses to secure capital early in the planning process. Investment firms seek to deploy their capital as rapidly as practicable and cannot afford to segment large portions of their dry powder to future projects that may not come to fruition.

Conclusion

Increased investment in energy infrastructure has the potential to boost near-term employment and offset some of the drag from the expected decline in E&P capex, but its real promise comes from its potential boost to long-run economic activity. The case for an energy-based “reindustrialization” in the U.S. depends not only on abundant reserves of low-cost natural resources, but also the infrastructure capable of transporting those resources seamlessly across the country. The recent decline in energy prices should focus investors’ attention on the hundreds of billions of dollars of investment in transportation, storage, generation and industrial facilities implicit to the most optimistic energy development projections.

Thank you once again for the opportunity to testify.