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## NORTH AMERICAN SHALE INFRASTRUCTURE OPPORTUNITIES ABOUND

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We have all read the reports of the extensive quantities of shale gas—and, increasingly, shale oil and other related liquids—present in North America. Merger and acquisition transactions, many of them “shale joint ventures,” have also been the subject of considerable reporting, all for good reasons. But taking advantage of the shale gas, oil and other liquids being produced requires significant infrastructure investments throughout the energy value chain. Many of the shale-related assets are located in parts of the United States and Canada that have relatively little energy infrastructure. For example, historically, the Marcellus and Utica Shale regions in Pennsylvania, West Virginia, Ohio and other states have not been serviced by a network of gas processing facilities and related transportation pipelines. Similarly, the Bakken Shale in North Dakota and surrounding states is not near an extensive network of crude oil pipelines or gas processing facilities. Even the Eagle Ford Shale in parts of south Texas is generating significant infrastructure activity.

In the case of the shale oil, most of the oil-related activity involves transportation. For example, today much of the oil from the Bakken Shale is being shipped by rail, e.g., to the U.S. Gulf Coast, but a number of pipeline projects are under development to bring that oil to points of interconnection with existing oil pipelines, thereby, alleviating some of the competition for rail cars with agricultural and coal businesses. Further, several large gas processing plants are being built to handle associated natural gas, much of which has been flared to date.

With respect to shale gas and associated liquids, the infrastructure opportunities are more complex. For example, additional gathering systems, gas processing facilities, transportation capacity, storage facilities and downstream facilities, including export facilities, are necessary. Many producers will build out the gathering system themselves, although it is quite common for that activity to be done in joint venture with midstream players or for the gathering facilities to be sold to midstream players (primarily MLPs with lower costs of capital) after build-out. The midstream companies are racing to build additional transportation capacity along with natural gas processing plants to take advantage of the opportunities presented by so much shale gas and associated liquids in areas of the United States and Canada not historically served to this extent by the midstream companies.

Further opportunities abound downstream of the gas processing facilities. For example, a number of fractionation projects are under development to separate natural gas liquids streams into their component parts. Numerous storage projects are underway in the Mont Belvieu, Texas area, as well as in parts of the Marcellus Shale region and elsewhere. Ethane is particularly desirable today because of its use as a cost-advantaged petrochemical feedstock. Many petrochemical companies, such as Dow, Sasol and Westlake Chemical, have announced major projects to convert their ethylene crackers to using ethane as a feedstock instead of propane or naphtha (which typically is priced off crude oil rather than natural gas). Still others have announced major expansions of crackers, as well as new-build ethylene crackers. For example, Chevron Phillips Chemical, Shell Chemical and others have announced new ethylene cracker projects, with Shell's the most advanced in the Marcellus Shale region, although others remain under development as well. Most of the new petrochemical projects are expected to be located along the U.S. Gulf Coast to take advantage of the existing significant

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infrastructure already present in that region. Enterprise Products has a significant project underway to transport ethane from the Marcellus and Utica shales to the U.S. Gulf Coast.

Other projects are underway to produce methanol and fertilizer, as well as to construct gas-to-liquids (GTL) facilities. Sasol and Shell, for example, have announced major GTL projects along the U.S. Gulf Coast, hoping to take advantage of long-term supplies of relatively low-priced natural gas. Additional such projects are likely, as are export projects for LPGs such as propane and butane, projects to utilize compressed natural gas or LNG for fleet or long-haul transportation fuel, construction of steel and aluminum manufacturing facilities and other projects that need large supplies of relatively low-priced natural gas.

Another infrastructure opportunity arising from the presence of so much shale gas involves LNG exports. Numerous LNG export projects are under development in the United States and Canada. Several of the projects are greenfield-type projects, while others are predicated on the use of an existing LNG import terminal and the construction of additional liquefaction facilities to take advantage of the common facilities associated with the import terminals. The most advanced of the LNG liquefaction projects in the United States is Cheniere's Sabine Pass project in Louisiana, which, as of this writing, is the only project to have received authorization from the U.S. Department of Energy (DOE) to export LNG from the United States to countries with which the United States does not have a free trade agreement (FTA) in place. At the moment, DOE is awaiting the results of the second of two reports it commissioned to study the effects of potential LNG exports from the United States before then proceeding with other export applications to non-FTA countries (export applications to countries with which the United States has a free trade agreement extending to natural gas are routinely granted by DOE).

In Canada, the Kitimat LNG export project of Apache, EOG and Encana, located in British Columbia, and another BC project led by Shell continue to make progress. Their proximity to key markets in North Asia provides competitive advantages.

All in all, the energy picture in North America has changed dramatically over the last decade. Many experts now believe the United States has a natural gas supply in excess of 100 years, while other experts believe that U.S. dependence on imported oil will decline significantly as further shale oil resources are developed. It is an exciting time to be involved in the North American energy industry.

## ABOUT THE AUTHOR



Steve Davis has almost 30 years of experience representing sponsors/developers and project companies, sellers and buyers, financial institutions, private equity investors, and other parties on major transactions relating to oil and gas, LNG, power, refining, mid-stream, pipeline, processing, petrochemical, renewables and cleantech, as well as other energy industries. He focuses his practice on the areas of project finance and development, mergers and acquisitions, joint ventures, foreign direct investment, private equity and venture capital, and restructuring and reorganization transactions, including ones involving climate change, carbon capture, emissions credits and related issues.

Mr. Davis is an active participant in the international legal market, having worked on a wide range of transactions spanning five continents. He has traveled extensively in Asia, Australia, Europe, Southern Africa, the Middle East, and Central and South America, and has significant experience working in the Middle East/North Africa, Latin America and the Asia-Pacific region, having been managing partner of his previous firm's first office in Asia for over six years. For a number of years, Mr. Davis was named one of Asia's Leading Lawyers in Asia Law & Practice surveys of practitioners in the region.

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