

## Shale Gas Market Expansion Bolstering U.S. Outlook

PwC

NEW YORK — The expansion of the shale gas market could potentially drive significant benefits to the U.S. chemicals industry, including decreased raw material and energy costs, according to a new report released today by [PwC US](#) [1] titled, [Shale Gas: Reshaping the U.S. Chemicals Industry](#) [2]. In fact, another recent PwC report estimated that the potential impact of [shale gas](#) [3] on U.S. manufacturing could enable U.S. manufacturers to lower their raw materials and energy costs as much as \$11.6 billion annually by 2025.

Before natural gas from shale can be transported efficiently and sold commercially, impurities must be extracted. The by-products of this process, known as natural gas liquids (NGL), include hydrocarbons such as ethane, butane and propane. The chemical industry uses NGL's to produce a variety of derivative products that ultimately become raw materials for multiple manufacturing sectors. In the case of ethane, they convert it to ethylene — the most significant single chemical in terms of volume and value — and then a range of downstream products. A sampling of manufacturing sectors that ultimately benefit from greater capacity and more attractive pricing of NGLs spans apparel and accessories, computers and electronics, machinery, textile and fabrics and transportation equipment, among others.

“As the U.S. chemical industry expands NGL conversion into a higher volume of downstream products, the positive impacts could flow through the value chain into other manufacturing sectors, particularly given that chemicals are used in an estimated 90 percent of all manufactured products,” said [Anthony J. Scamuffa, U.S. Chemicals leader for PwC](#) [4]. “Not only could the abundance of NGLs help drive reduced pricing for derivative products, it could also potentially drive domestic re-shoring activity and possibly bring about a favorable shift in the U.S. balance of trade as ethylene capacity comes on line.”

Major oil and gas companies and upstream commodity industry participants are evaluating their business models and actively moving forward to take advantage of emerging shale gas opportunities. Some are considering whether to restart mothballed assets, invest in green field projects, form strategic alliances, and expand and upgrade existing assets. Many of these companies are also executing large capital projects, identifying engineering and construction resources, and establishing strategic sourcing agreements with NGL providers.

Further downstream, specialty chemical entities are starting to feel the effects of natural gas and NGL prices on their business models. Moreover, as the commercial distribution of ethane and ethane-based raw materials increases, it could trigger new innovations and investment in new technologies. Research and development

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initiatives leveraging ethylene-based chemistries that replace petroleum-based products may predominate. Companies might also look for longer-term sourcing relationships and partnerships with raw material suppliers to help with developing new products.

“Based on industry reports, we estimate that the U.S. chemicals industry has invested \$15 billion in ethylene production, increasing capacity by 33 percent. As these investments take hold yielding more supply, the U.S. could become a major, global, low-cost provider of energy and feed stocks,” said Garrett Gee, Director of Chemical Advisory Services at PwC. “We are already seeing increased investment activity among multinational companies in building the infrastructure to export liquefied natural gas (LNG) products.”

As manufacturers replace petroleum-based raw materials with products based on ethylene, their cost structures should also change significantly, as well as supply and demand for certain products. This pattern may be repeated for other petroleum-based raw materials, many of which are used in building, construction, adhesives, paint, coatings, plastics, packaging and carpeting. If the changes brought about by shale gas take hold in the chemicals industry, they will also create a need for specialty steels, reactors, pumps, valves, fittings, control systems, storage tanks, and other equipment, as well as the services of engineering and construction firms. Another possible outcome is that chemical products will increasingly become a substitute for more expensive materials, such as metals, glass, wood, leather and textiles.

“There is no doubt that the significant increase in NGL production could drive change across the U.S. chemicals industry, but the full potential of the market will depend on a number of factors. According to a New York Times article by Michael Levi in August, these factors include domestic tolerance for expanded hydraulic fracturing and its waste products, as well as the political and economic ramifications of exporting LNG,” added Scamuffa. “The implications of the shale gas boom for the chemicals sector also vary by company, so management teams need to consider their individual situation and business options, including the risks and opportunities presented by the abundance of shale gas.”

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### About PwC’s Global Chemicals Practice

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[1] <http://www.pwc.com/>

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[2] <http://www.pwc.com/us/en/industrial-products/publications/shale-gas-chemicals-industry-potential.jhtml>

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