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Hydraulic Fracturing, Natural Gas, and the U.S. Manufacturing Renaissance

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The Great Recession has been hard on America's domestic manufacturing industries. Even before the 2008 economic spiral, domestic industries suffered under the pressures of foreign competitors with lower labor, raw material, and energy costs, as well as more permissive regulations. In the face of this downturn, America's oil and gas industry, an industry which itself was facing declining domestic production, embraced game-changing technology with the capability of unlocking unprecedented reserves of oil and gas.

Hydraulic fracturing and horizontal drilling—the techniques that allow for the extraction of unprecedented amounts of natural gas and oil from low-porosity rock such as shale—have literally reversed the course of energy production in America and, in doing so, transformed the fates of many manufacturing industries. As an energy-intensive industry and a major supplier to the oil and gas industry, valve manufacturers are key beneficiaries of America's energy revolution.

Despite the importance of the oil and gas industry on domestic manufacturing, there are widespread misapprehensions about hydraulic fracturing and horizontal drilling. These misapprehensions are fueled by anti-hydrocarbon environmental groups, uninformed press reports, and even an Oscar-nominated filmmaker pursuing an anti-energy agenda.



Richard Ranger of the American Petroleum Institute and Rep. James Keffer (TX-60) discuss hydraulic fracturing at Kelley Drye's seminar.

On October 23, 2012, Kelley Drye & Warren, LLP, a law firm which represents manufacturers and manufacturing trade associations, including the Valve Manufacturers Association, convened a conference of key members of the oil and gas and manufacturing industries entitled Hydraulic Fracturing, Natural Gas and the U.S. Manufacturing Renaissance. The seminar, which drew over 50 companies and trade associations, was designed to help industries that benefit from low energy prices and a thriving domestic energy industry to understand America's transforming energy industry, the policies and regulations that will shape America's energy future, and how energy and natural gas users can understand, and engage in, the energy policy

decisions that impact their bottom line.

Distinguished panelists, which included elected officials, policy makers, oil and gas experts, and labor representatives, helped answer some of the following key questions:

What are the technologies that are now spurring domestic oil and gas production?

While hydraulic fracturing (or "fracking") is typically the technology that grabs headlines, America's domestic energy revolution was really brought about by pairing hydraulic fracturing with horizontal drilling. In order to reach the low-porosity rock that holds oil and gas, a well is drilled to depths that can exceed one mile. As the bit nears source rock, the drilling operator begins a 90 degree turn and can then proceed drilling horizontally for over 4,000 feet. As many as eight of these horizontal wells can be drilled from a single well pad. Wells will not produce salable amounts of gas or oil, however, until they are stimulated with hydraulic fracturing.

Hydraulic fracturing involves the high pressure injection of fracturing fluid and sand into the well. The fluid pressure creates fissures in the rock and the sand holds those fissures open – thereby allowing the oil and gas to flow. Fracturing fluid is 90 percent water, 9.5 percent sand, and 0.5 percent chemical additives used to increase flow rate and well performance.

While the pairing of horizontal drilling and hydraulic fracturing has really taken off in the past 10 years, hydraulic fracturing is not a new technology. It has been used for over 60 years and in over a million wells.

Does hydraulic fracturing harm the environment?

Much has been made about the environmental impacts of hydraulic fracturing, most of which is either patently incorrect or greatly sensationalized. There has never been perfect energy source, and hydraulically fractured oil and gas are no different. While hydraulic fracturing has environmental impacts, they impacts have been successfully managed by state regulators and voluntary industry practices.



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Hydraulic fracturing is a water-intensive technology, and one which creates waste streams. These aspects have been effectively managed through recycling, industry best practices and aggressive state regulation. Wells are cased with multiple layers of redundant protections to ensure there are no leaks as the wellbore passes through aquifers. Significantly, in 60 years, there has never been a documented case of groundwater contamination caused by hydraulic fracturing. There are also air emissions that occur at various stages of well completion. These emissions are increasingly managed through voluntary measures, state regulation, and, recently, through federal regulation.



Dana Wood of Kelley Drye & Warren discusses future seminars for trade associations and companies that benefit from a healthy domestic energy industry

Like any industrial activity, hydraulic fracturing has environmental impacts, but those impacts are manageable and have been managed responsibly.

How are these technologies reshaping America's energy future?

While we have known for many years that vast amounts of oil and natural gas were trapped in tight rock formations, there was no economical way to access these resources. With the economic accessibility brought about by hydraulic fracturing and horizontal drilling, the Energy Information Administration (EIA) estimates that the U.S. holds over 2,203 trillion cubic feet (Tcf) of recoverable natural gas—enough to supply America's needs for over 90 years at 2011 natural gas consumption rates. Similarly, the International Energy Agency (IEA) estimates that the U.S. holds 33.2 billion technically recoverable barrels of shale oil. They further estimated that the U.S. could surpass both Russia and Saudi Arabia as the world's top energy producer by 2020 and could be energy self-sufficient by 2035.

Not only has the widespread utilization of these technologies redrawn the international energy map, it has already redrawn America's domestic energy map. Natural gas is being produced in a massive formation known as the Marcellus Basin, which stretches from New York to Tennessee. The Bakken formation that underlies North Dakota helped transform that state into America's leading oil producer and the state with the lowest jobless rate. Other basins brought into play with hydraulic fracturing stretch through the Mountain West and through Texas, Louisiana, and Alabama. With these plays and other prospective plays, the natural gas from shale fields is expected to bring in more than \$231 billion in GDP and \$57 billion in government revenues by 2035.

What does this mean for manufacturers?

With billions being invested in places like St. James Parish, Louisiana, Beaumont, Texas, Lee County, Iowa and Youngstown, Ohio, it is hard to overestimate the impact that domestic natural gas production is having on U.S. manufacturing. According to Price Waterhouse Coopers, lower feedstock and energy costs could help manufacturers reduce natural gas expenses by as much as \$11.6 billion annually through 2025, and U.S. manufacturing companies could employ up to 1 million more workers by 2025 due to benefits from affordable energy and demand for products used to extract natural gas. An estimated \$30 billion in new investment in the manufacturing sector is directly attributable to recent low natural gas prices, and the promise of abundant, low-cost fuels will give a competitive edge to industries like steelmaking, aluminum smelting, and automobiles, fertilizers and chemical manufacturing.

Increased domestic production is a boon for industries that use natural gas products as feedstock. Aither Chemicals, whose CFO spoke at the seminar, is partnering with Bayer Chemicals to build a catalytic ethane cracker in Pennsylvania's Kanawha Valley—the heart of the Marcellus Shale region.

Energy-intensive industries such as steelmakers, aluminum smelters, metal-casters, glassmakers, and the forest products industry all benefit from lower energy prices. Many energy-intensive industries doubly benefit because they supply the growing domestic energy market. This is certainly the case for valve manufacturers, steelmakers, and pipe fabricators—three industries which participated in the conference.

This seminar illustrated that domestic manufacturers and the oil and gas industry have a shared stake in promoting a healthy domestic energy industry. Such recognition is important because environmental groups and federal regulators have set their sights on hydraulic fracturing. If the administration uses its second term to bow to increasing pressures for radical new federal regulation, it could critically damage the domestic oil and gas industry and the fledgling resurgence of the U.S. manufacturing sector.

Kelley Drye's October 2012 seminar is the first in a series of industry discussions aimed at helping industries like valve manufacturers understand and engage in an effort to protect hydraulic fracturing and domestic energy development from overzealous regulation.

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