

# West Virginia: A Compelling Case

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## Rich energy history; solid energy expertise

West Virginia is an energy state. With a population of just 1.8 million, the state contributes significantly to the energy needs of the eastern United States.

- West Virginia is No. 2 in coal production behind Wyoming
- West Virginia is No. 4 behind Pennsylvania, Alabama and Illinois in net electricity exports, exporting 60 percent of the electricity it generates
- West Virginia is No. 10 in natural gas production
- West Virginia is the third most forested state in the Lower 48

West Virginia has long history in the oil and gas industry. Prior to the Civil War, the Burning Springs oil field in Wetzel County was one of only two oil fields in the U.S. This area, the north-central portion of the state, also was a focal point for early natural gas production.

For more than 80 years, the world's leading chemical companies have focused on West Virginia, taking advantage of its unique balance of natural resources, infrastructure, competitive taxes and incentives, community support for the industry and a skilled workforce.

Today, West Virginia's chemical industry directly employs 10,000 individuals, the state's largest manufacturing sector employer. Only the coal industry, with 17,000 employees, is responsible for more jobs in the state. The chemical sector provides \$8.2 billion in annual sales and \$714 million in local wages. Given the relevance of the chemical industry in West Virginia, the state has assisted in the development of three organizations that have day-to-day engagements with the industry.

## A chemical industry focus

The liquids-rich content of West Virginia's Marcellus and Utica shale gas plays has returned West Virginia to its chemical industry roots.

The first commercial ethylene plant was established in Clendenin, W.Va., in 1920, regarded as the origin of the petrochemical industry. In 1923, Union Carbide began production of several ethylene-based chemicals in South Charleston, W.Va. Under Union Carbide's leadership, the industry fostered a world-class research technology park. After Union Carbide's merger with DOW chemical, the technology park was discontinued.

To preserve the science and engineering talent recruited to the Charleston area by the chemical industry, principal researchers at the park and state government supported the formation of the Mid-Atlantic Technology, Research & Innovation Center (MATRIC), with research facilities and office space secured within the former tech park. Staff of this multi-disciplinary nonprofit

research and development center were listed as inventors on 89 patent applications from 2008 to 2011. Today, MATRIC has customers on six continents.

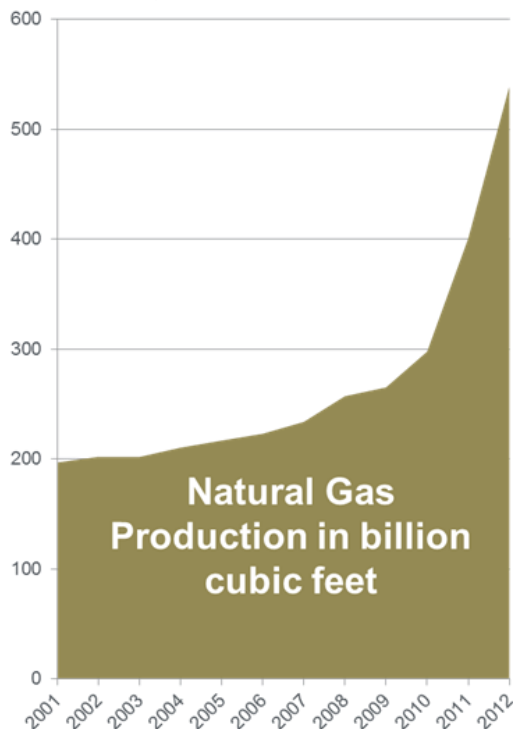
The Chemical Alliance Zone (CAZ) was created in 1999 to channel and leverage efforts to strengthen West Virginia's chemical industry. CAZ is a nonprofit collaborative of citizens, labor leaders, educators, government officials, chemical executives and business leaders. CAZ is dedicated to maintaining and expanding the business of chemistry throughout West Virginia.

The Polymer Alliance Zone (PAZ) was created in 1996 to recognize and advance polymer-based industries located in West Virginia. Established by the state of West Virginia through an executive order of then-Gov. Gaston Caperton, this industry association covers Jackson, Mason and Wood counties and contains one of the highest concentrations of high-technology, specialty and engineering polymers production in the world. PAZ membership includes polymer and related industries.

## Marcellus and more

In economic development, the most important public/private partnership is the one between the host state and the corporation that selects it. West Virginia is committed to understanding the requirements of businesses that locate in the state, becoming their partner on a journey from consideration to selection. Projects as large and complex as those being discussed today have many moving parts. As economic development partners, West Virginia and its business partner will resolve issues together, moving closer to formal project announcement.

### West Virginia



West Virginia quickly recognized the tremendous job and value-added opportunity represented by its liquids-rich shale development. The state's economic development agency, the West Virginia Development Office, launched a concerted effort to attract ethane cracker plants. The state's rapidly developing ethane supply, existing natural gas and transportation infrastructure, and its trained chemical workforce are strong competitive attributes. Industrial development activities include site identification, infrastructure assessment, permitting assistance and partnership development.

West Virginia received multiple responses from its recruitment efforts. The project that has advanced the furthest is a tentative commitment from Odebrecht, a Brazilian engineering and construction firm, along with Braskem, the U.S. leader in polypropylene production, to build a petrochemical complex in Wood County, one of the three counties in the state's Polymer Alliance Zone, mentioned previously. An ethane cracker, three

polyethylene plants and associated infrastructure for water treatment and energy cogeneration make up ASCENT: Appalachian Shale Center Enterprise. While Odebrecht has not formally committed to the project, it has purchased the property for the site and is receiving ethane supply commitments.

## Security through diversity

Shell's "Appalachia Cracker" project in Pennsylvania and West Virginia's ASCENT represent departures from the traditional ethylene development project. Since the early days of Union Carbide's presence in ethylene, West Virginia's regional ethylene market has migrated to the Gulf Coast. The employment and value-added benefits of polyethylene production accrue at the southern end of the pipeline.

West Virginia's big back yard, with unprecedented production levels of natural gas and associated natural gas liquids from shale resources, beckon the industry. As it continues to grow, diversifying the location of the infrastructure to support it will benefit more local economies, make the U.S. chemical industry more resilient and increase the likelihood of more local citizens participating in the benefits of shale gas.

Without a doubt, ethane storage and new ethane transmission lines to and from the production facilities will be costs to be encountered. Given the immensity of the resource, developers view these expenses as manageable. Their partner states view the costs eminently preferable to exporting economic opportunities.

West Virginia, in particular, has made a partnership commitment to Odebrecht and ASCENT. The opportunity to turn from a national decline in U.S. manufacturing sectors to a rising tide of thousands of jobs, economic diversity and energy security impels West Virginia's commitment as its highest priority. Not insignificant is West Virginia's desire to add increased value to its own natural gas production.

West Virginia's coal industry has suffered significant job losses. A mature liquids-rich shale economy, vertically integrated from extraction and production to value-added supply, represents an extraordinary boost to the state's manufacturing sector and the skilled work force that supports it.

Energy jobs are good jobs and secure the nation's energy future. But economic development through energy resources is not replicable in all states. The states gathered here today can capitalize on energy resources within their borders for the benefit of their local economies and the nation as a whole. Projects as significant as ASCENT require government partnerships, assistance and cooperation. West Virginia stands ready to provide it.