VIEWS & VISIONS

A publication of Bowles Rice LLP

Summer 2014

Cogeneration (CHP) Could Stimulate Demand for Natural Gas Throughout Region

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Prior to coming to WVU in July 2011, Mr. Van Nostrand spent three years as a member of the adjunct faculty at Pace Law School in White Plains, New York and executive director of the Pace Energy and Climate Center.

In his 22-year career in private practice, Mr. Van Nostrand represented energy clients in state regulatory proceedings in eight western states, as well as before the Federal Energy Regulatory Commission. Mr. Van Nostrand was recognized by the Energy Bar Association as its 2007 State Regulatory Practitioner of the Year.

Mr. Van Nostrand received a Master of Laws degree in environmental law from Pace Law School, a law degree from the University of Iowa College of Law, a master's degree in economics from SUNY at Albany, and an undergraduate degree in economics from the University of Northern Iowa.

The development of the Marcellus Shale within the region holds significant promise for increased economic activity and reduced dependence on the coal industry for jobs. The economic benefits flowing from shale gas development, however, are threatened by low natural gas prices arising from successful shale gas development around the nation.

Hydraulic fracturing and horizontal drilling have revolutionized the energy industry by unleashing vast quantities of natural gas at relatively low prices, resulting in an over-supply of natural gas that is depressing prices and threatening to dampen the economic benefits of shale gas development as drilling rigs are idled. Policymakers in the region should consider measures that would take advantage of the region's native resources, as well as help achieve a balance of supply and demand of natural gas at a price level where these resources can continue to be developed.

One measure that could stimulate the demand for natural gas is encouraging the use of cogeneration, or combined heat and power (CHP), for commercial and industrial facilities. CHP facilities typically are fueled by natural gas and, in addition to providing on-site generation for large customers, achieve substantial improvement in energy efficiency, thereby reducing energy costs and improving the cost competitiveness of commercial and industrial facilities.

More than one-quarter of the natural gas consumed in the United States is in the industrial sector, which includes industries such as chemicals, metals, minerals, oil refining, paper and food. Of the natural gas consumed in the manufacturing sector, 14 percent was devoted to CHP and other power systems. CHP systems capture and use the heat that would otherwise be wasted from the production of electricity. In other words, rather than two separate facilities – a centralized, large electric-generating unit (from which the waste heat is discharged into the atmosphere) and a stand-alone boiler at the industrial site to generate heat – a CHP unit at the industrial site would generate electricity and capture the waste heat for heating and/or cooling. As a result, CHP requires less fuel than equivalent separate heat and power systems to produce the same amount of energy.

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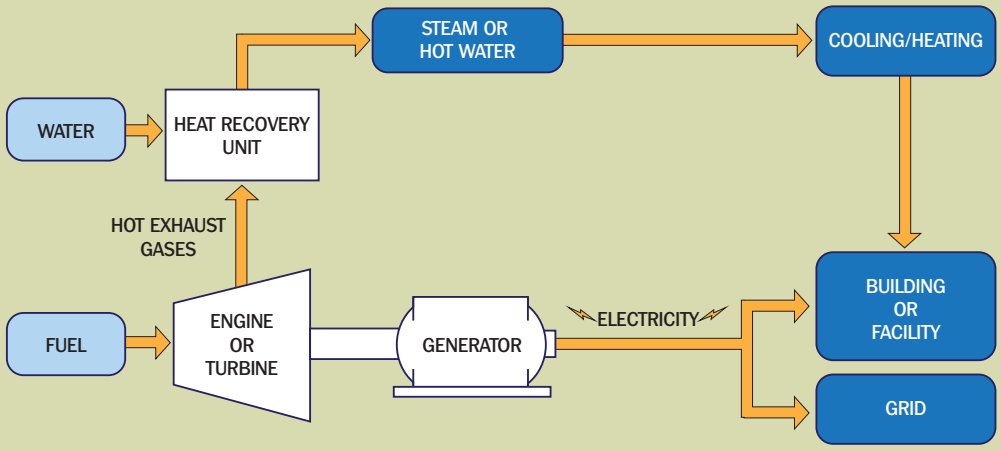
Currently, West Virginia has 382 megawatt (MW) of installed CHP capacity, with almost a third of that capacity (32 percent) coming from a single installation at a chemical plant. A 2008 Oak Ridge National Laboratory report estimated that West Virginia has the technical potential for an additional one to three gigawatts (GW) of CHP capacity. A 2012 report, from the American Council for an Energy Efficient Economy (ACEEE), estimated 1.7 GW of remaining technical potential within West Virginia, mainly in the chemicals and paper industries. The ACEEE further estimated that 588 MW would be economical to develop, if utilities were provided incentives to support the development of CHP.

CHP System: Gas Turbine or Engine with Heat Recovery Unit



CHP systems generate electricity by burning fuel such as natural gas to generate electricity and then use a heat recovery unit to capture heat from the combustion system's exhaust stream. The heat is converted into thermal energy, usually in the form of steam or hot water.

Source: United States Environmental Protection Agency (www.epa.gov)

Expanded deployment of CHP in Appalachia could provide numerous benefits. First, as noted above, the vast majority of CHP systems are fired with natural gas, so it serves the purpose of stimulating demand for natural gas. Second, CHP facilities substantially improve the cost-competitiveness of industrial operations by using energy much more efficiently and managing costs, and the economic benefits become even more compelling as electricity prices continue to rise. Third, the air emissions profile of CHP facilities is also an advantage; as states grapple with implementing the Environmental Protection Agency's new regulation of greenhouse gas emissions under the Clean Air Act, potential emission reduction benefits of CHP can be reflected when states develop their state implementation plans to achieve national ambient air quality standards.

The region's energy utilities can play a significant role in promoting CHP deployment at commercial and industrial facilities. Local gas distribution companies (LDCs) serving industrial customers could be aggressively pursuing the installation of CHP facilities at those locations where the necessary electrical and thermal load are present. Utility regulators could institute proceedings to explore the possible approaches, and invite the LDCs to propose incentive mechanisms designed to stimulate increased penetration of CHP facilities in the region. Among other things, utility regulators could consider offering rate incentives to provide financial rewards to LDCs that are successful in achieving customer installation of CHP facilities.

The region's electric utilities also should be enlisted in the effort. These utilities are quite familiar with their large industrial and commercial customers, including familiarity with thermal and electrical loads that would make a CHP facility an attractive economic investment. Utility regulators could consider providing financial incentives to the electric utilities, rewarding them for facilitating the installation of CHP facilities on their customers' sites. A similar program offered in Connecticut in 2008-2009 was very successful in achieving more widespread deployment of CHP facilities.

We have a tremendous opportunity in the Marcellus Shale states to take advantage of shale gas development to transform our region's economy. Increasing the penetration of CHP resources, in addition to helping stabilize natural gas prices at sustainable levels, would result in lower energy costs, reduced air emissions, and a cost-effective means of complying with EPA regulation of greenhouse gas emissions.