

### Case Study: Marcellus Shale

Provided by: KGRA Energy

#### Description:

The Marcellus Shale is a unit of marine sedimentary rock found in eastern North America. The shale contains largely untapped natural gas reserves, and its proximity to the high-demand markets along the East Coast of the United States make it an attractive target for energy development.

Professors at Pennsylvania State University and the State University of New York at Fredonia have calculated that the Marcellus might contain more than 500 trillion cubic feet of natural gas. Using some of the same horizontal drilling and hydraulic fracturing methods that have previously been applied in the Barnett Shale of Texas, perhaps 10% of that gas (50 trillion cubic feet) is thought to be recoverable. *That volume of natural gas would be enough to supply the entire United States for about two years and have a wellhead value of about one trillion dollars.*

#### Significance of the Marcellus Shale for Wasted Heat Recovery:

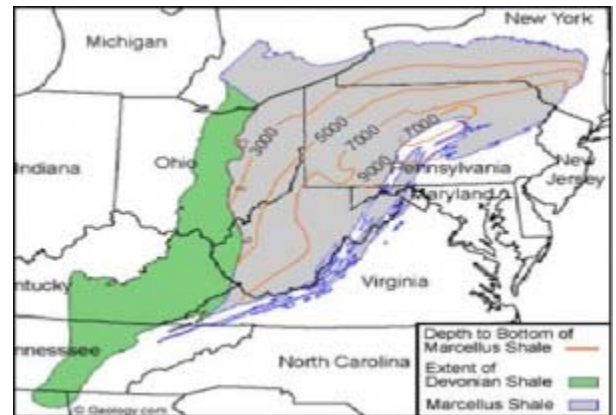
The Marcellus Shale represents one of the fastest growing areas of natural gas exploration, production, and transportation in the United States. In order to get the produced gas to market, gas companies must first compress the gas and insert it into a network of pipelines.

To compress gas, reciprocating engines or combustion turbines are used to power the main compressor. These natural gas-powered engines can supply as much as 40,000, 50,000 or even up to 100,000 horsepower to the compressors. For each 10,000 horsepower of natural gas-fired compression, roughly 1.4 megawatts of zero carbon emission electricity can be generated.

Many hundreds of thousands of horsepower are being installed into the Marcellus region. KGRA Energy estimates that there are at least 150MW of potential power that can be produced from wasted heat in the Pennsylvania portion of the Marcellus Shale and another 150MW of power from other states' share of Marcellus Shale compression waste heat. At an installed cost of roughly \$4,000 per MW, this represents some \$600,000,000 of investment into Pennsylvania and a total of ~\$1,200,000,000 of investment in the Marcellus region in total.

Given the sheer volume of gas that will be produced from this formation along with the insatiable need for gas from the large markets in the Northeast, the opportunity to produce power from recovered heat in the Marcellus Shale region is enormous.

Visit our website at [www.heatpower.org](http://www.heatpower.org) to learn more about how you can help your state meet its waste heat to power potential today.



*The Heat is Power Association is the trade association of the Waste Heat to Power industry. Representing businesses across the United States, the not-for-profit association is committed to educating decision makers and the public about the benefits of waste heat as an American economic driver and clean energy resource. The Heat is Power Association promotes the efficient, industrial use of American-generated power through Waste Heat to Power processes. To learn more, visit [www.heatpower.org](http://www.heatpower.org).*