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Water Shortages Threaten Shale Gas Development

Ken Silverstein | Nov 04, 2013



If water is the new oil and shale gas is the new energy savior, something has to give. That's because the exploration for the unconventional form of natural gas uses so much water that it is encroaching on society's other needs.

Not only do utilities consume it. So does big industry and small residential households. Complicating things, the demand for electricity in this country is expected to rise by 1.5 percent over the next 20 years. Governments and businesses alike are now calling for concerted conservation efforts and technological advances.

The debate is having practical implications on both utilities and energy developers. A few years ago, the states of Georgia and Alabama battled over supplies during a severe drought in the southeastern United States: Atlanta's metropolitan area competes directly with Alabama's electric generators, manufacturing facilities and farm businesses for the region's water. And, in Texas, the combination of hot summers and water shortages are pitting farmers against shale-gas developers.



"Freshwater resources around the world are under threat from fossil fuel development, and these threats are emerging in new places with rapid growth in recent years of natural gas extraction from shale using horizontal drilling and hydraulic fracturing," says a report by Morgantown, WV-based [Downstream Strategies](#). "This technique has been criticized for its environmental impacts, including dewatering streams and surface-and-groundwater pollution."

The outfit examined water usage in the Marcellus Shale region and specifically in Pennsylvania and West Virginia. It says that between the two that 4.1 million to 5.6 million gallons of fresh water is used where 9,000 wells have been permitted, which makes it the largest consumer of water among the various shale formations.

Fuel Diversity

About 30 percent of the country's electricity now comes from natural gas, which is an increase of 7 percent from a decade ago, says the U.S. Energy Information Administration. Of that, shale gas makes up about 25 percent. In West Virginia, for example, surface waters are mostly used to feed the need, but only 8 percent is recycled; the rest remains underground. Nationally, Downstream says that in 2006 there were 35,000 wells that had been fractured that had required as much as 140 billion gallons per year of water.

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"With the boom in shale gas production not starting in earnest until 2008, the volume of water required to frack for natural gas has increased by an order of magnitude or more," says Downstream.

According to the [World Policy Institute](#), coal-and-oil-fired power plants consume roughly twice the water than that of gas-fired facilities while nuclear generation needs three times that of natural gas. Cleaner coal technologies such as coal gasification will reduce that need by as much as half but, emerging concepts like carbon capture and burial could increase consumption between 30-100 percent.

Wind and rooftop solar panels, meantime, are the most efficient forms of generation when it comes to water. However, large and commercial solar plants use twice the water as coal and five times the amount as gas-fired plants. Further, corn-based bio-fuels used in transportation consume much greater amounts of water than does the drilling for traditional oil.

The [National Energy Technology Laboratory](#) adds that average thermoelectric plants account for 48 percent of total withdrawals. But newer plants here are more efficient and they are able to recirculate water or use dry cooling, which is technically referred to once-through cooling.

"In short, the true scale of water impacts can still only be estimated, and considerable improvements in industry reporting, data collection and sharing, and regulatory enforcement are needed," concludes Downstream. "The challenge of appropriately handling a growing volume of waste to avoid environmental harm will continue to loom large unless such steps are taken."

Water shortages would hit every aspect of society, especially utilities that are the underpinnings of economic growth. While newer technologies are integral to water preservation, it is clear that the such threats are often dismissed but really do necessitate more fuel diversity and greater energy efficiency.

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