

The state of shale

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University of Pittsburgh researchers have shared their findings from three studies related to shale gas in a recent special issue of the journal *Energy Technology*, edited by Götz Vesper, the Nickolas A. DeCecco Professor of Chemical and Petroleum Engineering in Pitt's Swanson School of Engineering.

In the special issue focusing on shale gas, Pitt faculty authors look at "smart wells" that use wireless communication, wastewater management, and [information gaps](#) between legislators, regulators, industry representatives, researchers, and the public on the health and environmental impacts of shale gas drilling. The issue also includes contributions from experts from across the United States, Europe, and Asia.

Vesper, who is on the journal's editorial board, says, "I saw an opportunity to create visibility for the journal by issuing a special issue on this topic, which has garnered much attention worldwide, and at the same time highlight some of the world-class expertise in this area on our campus as well."

Pitt faculty members contributed three papers to the issue.

Smart Wells

Andrew Bunker and his co-authors propose the development of a series of sensors sunk into wells that will allow drilling companies to pull data from the deep and use that information to optimize sections of

productive wells, ramp up or shut down unproductive sections, and find pockets of gas or oil that have been overlooked.

Bunger, assistant professor of civil and [environmental engineering](#), along with Ervin Sejdić, assistant professor of electrical and [computer engineering](#), Nicholas Franconi, a PhD candidate in electrical and computer engineering, and Marlin Mickle, professor emeritus of electrical and computer engineering, believe academics and industry are poised to improve extraction through [wireless communication](#).

Bunger likens this nascent technology to cell phone communication, with the signal being passed from tower to tower on a call from, say, Pittsburgh to Los Angeles rather than beamed directly over great distance. The stepwise process is necessary, he says, because of the difficulty of sending data long distances through rock and other geological media.

Wastewater Management

Pitt's Radisav Vidic investigates methods to safely reuse drilling wastewater and ways of removing potentially harmful substances, including naturally occurring radioactive materials, from the wastewater.

Vidic, the William Kepler Whiteford Professor and Chair in the Department of Civil and Environmental Engineering and a nationally recognized expert in water issues related to fracking, reviews the management of wastewater produced during fracking in Pennsylvania's Marcellus Shale reserve. In this paper, he is joined by co-authors Can He, Tieyuan Zhang, Xuan Zheng, and Yang Li, all of Pitt's Department of Civil and Environmental Engineering.

Information Gaps

Shanti Gamper-Rabindran examines the gaps in the collection of information—and access to that information—which prevents the public, researchers, regulators, and investors from fully understanding the health and environmental impacts from the shale industry. Resolving these information gaps would enable further innovations in risk-management strategies and, thus, benefit the industry and society.

She is an associate professor in Pitt's Graduate School of Public and International Affairs and the Department of Economics within the Kenneth P. Dietrich School of Arts and Sciences.

"Informed public debate in the lifecycle of unconventional [shale gas](#) development is critical because of the uncertainties in its benefits and risks, the unequal distribution of these benefits and risks in society, and the need to make evidence-based trade-offs between the benefits and costs of risk-mitigation strategies," Gamper-Rabindran writes.

Provided by University of Pittsburgh

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