

WORKSHOP HIGHLIGHTS

October 2014

RISK AND RISK GOVERNANCE ISSUES IN SHALE GAS DEVELOPMENT: SUMMARY OF TWO WORKSHOPS

Natural gas production in the United States is dramatically increasing because of the combination of horizontal drilling and hydraulic fracturing technologies, commonly called “fracking,” which use fluids to force gas out of shale formations deep underground. Proponents point to contributions to local economies and energy independence. Others have expressed concern about risks fracking may pose, such as to human health, environmental quality, and community cohesion.

Because governments at all levels are being confronted with choices about fracking, a better understanding of the risks – and the best ways to address them – is important. In 2013, the National Research Council held two workshops in Washington, D.C., to explore a range of issues related to risks associated with shale gas development and their management. The workshops are summarized in *Risk and Risk Governance Issues in Shale Gas Development: Summary of Two Workshops*. This brief offers an overview of the topics covered at the workshop and in the summary report.



WORKSHOP ON CHARACTERIZING THE RISKS INVOLVED IN SHALE GAS DEVELOPMENT

The first of the two workshops, held on May 30-31, 2013, explored what is known about the risks posed by shale gas development. Videos of presentations can be found at <http://tinyurl.com/lzs8vvn>.

- Thomas Webler of the Social and Environmental Research Group presented the results of a survey that asked various groups – industry, anti-fracking, financial, regulatory, and others – about their concerns related to fracking.
- Kris Nygaard from the ExxonMobil Production Company spoke about operational risks in shale gas development – such as groundwater contamination and seismicity – and steps companies take to manage risks.
- Avner Vengosh of Duke University presented information on water-related risks from fracking, such as stray methane getting into drinking water wells and surface water contamination, and discussed possible long-term effects, such as impacts on water availability in the West.
- Christopher Moore of the Desert Research Institute examined air emissions that can occur at each stage of the shale gas life-cycle, summarizing available data and noting areas where data are lacking.
- John Adgate of the Colorado School of Public Health discussed knowledge about public health risks associated with shale gas development, including discussion of a health impact assessment his group conducted in Battlement Mesa, Colorado.
- Zachary Bowen and Aida Farag of the U.S. Geological Survey explored the ecological risks related to unconventional oil and gas development, including fracking; direct effects shale gas development can have on terrestrial animals and plants and how researchers estimate these impacts; and impacts the fracking water cycle can have on aquatic ecosystems.
- Richard Newell of Duke University spoke about the climate change impacts of shale gas development, including through methane emissions; replacement of coal, renewable, and nuclear sources of power; and effects of abundant gas on overall energy demand.

- Jeffrey Jacquet of South Dakota State University described the “blessings and curses” that natural resource development confers on communities, discussing four types of risks and identifying four main gaps in knowledge.

During closing discussions, participants were asked to reflect on areas where further research is needed to understand risks. Individual participants pointed to risks to public health, ecological risks, risks to air quality, risks to communities, implications for climate change, and risks to water resources.

WORKSHOP ON GOVERNANCE OF RISKS OF SHALE GAS DEVELOPMENT

The second workshop, held on August 15-16, 2013, explored approaches to governing and managing the risks that shale gas development may pose. Videos of presentations can be found at <http://tinyurl.com/k8xo57g>.

- Gabrielle Wong-Parodi of Carnegie Mellon University reported on the results of an open-ended survey that asked about concerns related to governance of shale gas development.
- Barry Rabe of the University of Michigan offered an overview of governance issues surrounding shale gas development, noting that the constrained federal role may create opportunities for states, localities, and industry organizations to develop new roles in governance.
- Mark D. Zoback of Stanford University drew on the 2011 reports of the Secretary of Energy Advisory Board on shale gas development, on which he served, and which recommended ways to develop shale gas in an environmentally responsible manner.
- Hannah Wiseman of Florida State University identified factors that influence states’ ability to govern shale gas development, including data needs, states’ capacity, and substantive controls.
- Charles Davis of Colorado State University explored the question of whether state regulatory authority trumps local land-use autonomy in shale gas development.
- Sheila Olmstead of the University of Texas presented on the potential for managing and reducing risk from shale gas development through innovative regulatory approaches, such as liability rules and market-based approaches.
- Elizabeth Bomberg of the University of Edinburgh explained how shale gas development is governed in the European Union, which has applied four principles: precaution, transparency, consultation, and environmental sustainability.
- Louis LaPierre of the University of Moncton described shale gas development in New Brunswick, Canada, where

he helped to establish an independent institute to provide science-based information to guide policy decisions.

- Aseem Prakash of the University of Washington summarized knowledge about industry self-governance, specifically how voluntary environmental programs get started, attract companies to join, and improve company and industry environmental performance.
- Jennifer Nash of Harvard University considered the potential for effective industry self-regulation in the shale gas and oil sector, focusing on operators in Pennsylvania.
- Nancy Leveson of the Massachusetts Institute of Technology spoke about how safety culture has arisen in various industries and offered ideas for ways to develop a strong safety culture in the shale gas development industry.
- D. Warner North of Northworks, Inc., spoke about how to incorporate public and stakeholder participation in shale gas development.
- Andrew Place of the Center for Sustainable Shale Development discussed regional experiments in shale gas risk governance, such as the Center, a collaboration of industry, philanthropy, and environmental NGOs.
- Christine Conn of the Maryland Department of Natural Resources and Brigid Kenney of the Maryland Department of the Environment explained Maryland’s proposed Comprehensive Gas Development Plan, which examines the cumulative impact of placing multiple wells before any of the wells is permitted.

Several presenters and participants identified particular challenges for risk management, including public distrust of both industry and government and the need to integrate the management efforts of public, private, and nonprofit entities. Presenters and participants also suggested solutions, such as implementing principles of caution, transparency, and consultation, and using fees or taxes on shale gas development to manage its risks.

For more information....This brief was prepared by the Board on Environmental Change and Society based on *Risks and Risk Governance in Shale Gas Development: Summary of Two Workshops*. The project was supported by the National Science Foundation, the Park Foundation, and Shell Upstream America. Copies of the workshop summary are available from the National Academies Press, <http://www.nap.edu>.

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