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# Modernizing Bonding Requirements for Natural Gas Producers

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# Modernizing Bonding Requirements for Natural Gas Producers

*Hydraulic fracturing* (“fracking”) and other recent advances in extraction technologies have dramatically increased the availability of natural gas and offer potentially tremendous benefits to the U.S. economy. However, these technical advances also pose risks to the environment, including groundwater contamination and “blowouts” (sudden releases of gas), which have caused some states to temporarily or permanently ban their use. Environmental concerns associated with mineral extraction are not new, but current policies do not adequately address the unique risks associated with these new technologies and must be updated.

In a new discussion paper for The Hamilton Project, Lucas Davis of the University of California, Berkeley, proposes enhancing and expanding a market-based approach to promoting environmental stewardship—federal and state bonds, which require producers to post a monetary guarantee before drilling that would be returned when drilling is completed. Bonds help to motivate producers to take precautions when undertaking a mineral extraction process and ensure that funds are available for cleanups if accidents occur. In particular, Davis argues, bonds are an important policy tool available to policymakers concerned about environmental damages from fracking.

## The Challenge

Environmental concerns surrounding the extraction of natural resources are not a new problem. Government regulation and the ability to seek recourse through the legal system are two major ways to protect the environment and the health of citizens during mineral extraction. These approaches encourage companies to drill safely, both by mandating certain safety practices and by holding companies responsible for damages. Another incentive for producers to take responsibility and care during mineral extraction is to require the driller to post a bond that confirms that the company has the resources to compensate for any harm caused to people and the environment.

From an economic perspective, a bond will motivate producers to take required precautions during drilling to ensure the bond is returned in full when mining is completed. Bonding also helps with enforcement; it is prohibitively expensive to have regulators in attendance at the thousands of locations where drilling occurs. Moreover, fracking techniques are evolving so rapidly that enumerating the potential risks is challenging,

and drafting effective regulations for all dimensions of well construction and production is not possible. Because producers understand better than regulators the potential environmental risks with particular projects, the bond puts the onus on the natural gas producers to take appropriate precautions.

Policymakers have long recognized the value of posting a bond. Federal legislation dating back to the 1920s requires producers to post a refundable bond prior to drilling on federal lands; many states have similar laws for drilling on private lands. However, current minimum bond amounts provide inadequate levels of protection.

Minimum bond amounts for drilling on federal lands were last updated in 1960 and were designed to deal with risks posed by traditional drilling techniques then in use. Their current value is, in fact, too low to deal with those traditional risks and far too inadequate to cover the new risks posed by fracking. The Bureau of Land Management estimated in a 2002 report that the costs of plugging and reclaiming a single orphaned well site range from \$19,000 to \$75,000, well above the \$10,000 minimum bond amount required. The current process of hydraulic fracturing for oil and natural gas poses new risks. Fracking requires the use of large quantities of chemically treated water. Wells tend to be at low depths where gas is under high pressure, thus increasing the chances of groundwater contamination, blowouts, and other problems.

Additionally, fracking is a technology used by smaller companies than those in the oil and gas industries. In theory, the tort system is designed to recover damages but can be an insufficient deterrent. Bankruptcy laws limit this liability significantly, and for small companies potential environmental damages can exceed the total value of the company. Not only may the companies be unable to afford cleanups, they may choose to engage in more risky practices than they would if they faced the full cost of all potential environmental damages.

## A New Approach

Bonding requirements are well suited to address risks from surface spills, groundwater contamination and blowouts. Strengthening bonding requirements would increase the incentives for good behavior by producers, lower the number of accidents, and increase the funds available from which to draw in the event of an accident. Davis proposes four policies to modernize existing bond requirements for natural gas producers: increase bonding requirements for drilling on federal lands, impose higher bonds for fracked wells, encourage states to adopt similarly robust bonding requirements, and eliminate blanket bonds.

## A. Increase Bonding Requirements for All Drilling on Federal Lands

An estimated 25 to 30 percent of hydraulic fracturing occurs on land under the jurisdiction of the Bureau of Land Management (BLM) within the U.S. Department of the Interior. These are national parklands or other lands under federal authority. Current minimum federal bond values were last set in 1960, and because they were not indexed to inflation, their real value has since eroded by more than 80 percent, pricing them far lower than were the original intentions of Congress. Davis argues that a good first step would be for Congress to increase the minimum bond amount from \$10,000 to \$60,000 per lease (each lease covers five wells on average) merely to adjust for inflation (Figure 1). The inflation adjustment would apply to all oil and gas drilling and would merely update the law to function as Congress initially intended.

For the future, Davis proposes indexing the minimum bond amount permanently to inflation, ensuring that the dollar amount does not continue to decrease. Each year, the required minimum bond amounts for new wells would increase. These increases would take effect for new wells only, and the minimum bond amount would remain the same throughout the life of a well.

## B. Impose Higher Bonds for Fracked Wells

Davis also proposes higher bond minimums when fracking is used to account for the additional risks posed by the drilling process. Determining the correct minimum amount is challenging because so little is understood about the potential environmental damages from the new drilling techniques. However, it is exactly this uncertainty that has contributed to the opposition and concern about fracking and has caused bans in New York and Vermont. In the face of this uncertainty, it may be prudent to double the required minimum bond amount, relative to the minimum for traditional wells. This would increase costs for drillers, and it is recommended that a clear timeline be established for returning the capital to the stakeholders, with any interest earned for cases where no damages emerge.

As more information is disclosed about potential damages, it will be important to re-evaluate minimum bond amounts. The U.S. Environmental Protection Agency is undertaking a large-scale national study on the potential environmental impacts of hydraulic fracturing and plans to make available a full report in 2014. Once available, this could be used as a starting point for assessing these new risks and updating the appropriate bonding amount when fracking is used.

TABLE 1.

## Existing Federal and State Bonding Requirements

	Bond amount depends on well depth	Minimum bond amount per well	Blanket bond amounts
<b>Federal Lands, per Lease</b>			
	N	\$10,000	\$25,000-\$150,000
<b>States with Substantial Proven Shale Reserves, per Well</b>			
Arkansas	n.s.	Not to exceed \$100,000	n.s.
Kentucky	Y	\$500-\$5,000	\$10,000-\$100,000
Louisiana	N	n.s.	n.s.
Michigan	Y	\$10,000-\$30,000	\$100,000-\$250,000
Montana	Y	\$1,500-\$10,000	\$50,000
New Mexico	Y	\$5,000-\$12,500	\$50,000
North Dakota	N	\$50,000	\$100,000
Ohio	N	\$5,000	\$15,000
Oklahoma	N	Varies	\$25,000-\$50,000
Pennsylvania	Y	Varies	\$250,000-\$600,000
Texas	Y	\$2 per foot	\$25,000-\$250,000
West Virginia	N	\$50,000	\$250,000
<b>All Other States, per Well</b>			
Alabama	Y	\$5,000-\$50,000	\$100,000
Alaska	N	\$100,000	\$200,000
Arizona	Y	\$10,000-\$20,000	\$25,000-\$250,000
California	Y	\$15,000-\$30,000	\$100,000-\$1,000,000
Colorado	Y	\$10,000-\$20,000	\$60,000-\$100,000
Delaware	N	n.s.	n.s.
Florida	Y	\$50,000-\$200,000	\$1,000,000
Georgia	N	Not to exceed \$50,000	\$50,000
Idaho	N	\$10,000	\$25,000
Illinois	Y	\$1,500-\$3,000	\$25,000-\$100,000
Indiana	N	\$2,500	\$45,000
Kansas	Y	\$7,500-\$30,000	\$30,000-\$45,000
Maryland	N	Not to exceed \$100,000	Not to exceed \$500,000
Mississippi	Y	\$10,000-\$50,000	\$100,000
Missouri	Y	\$1,000-\$4,000	\$20,000-\$30,000
Nebraska	N	\$5,000	\$25,000
Nevada	N	\$10,000	\$50,000
New York	Y	\$2,500-\$250,000	\$25,000-\$2,000,000
North Carolina	Y	\$5,000 + \$1 per foot	n.s.
Oregon	Y	\$10,000-\$25,000	\$100,000-no limit
South Dakota	N	\$5,000	\$20,000
Tennessee	N	\$2,000	\$10,000
Utah	Y	\$1,500-\$60,000	\$15,000-\$120,000
Virginia	N	\$10,000	\$25,000-\$100,000
Washington	N	Not less than \$50,000	Not less than \$250,000
Wyoming	Y	\$10,000-\$20,000	\$75,000

NOTE: "n.s." - not specified in legislation.



## C. Encourage States to Increase Bond Amounts

State-level minimum bond amounts should also be increased. There is a substantial public interest when drilling occurs on private lands due to the potential of non-localized environmental damages. Environmental risks impose substantial public costs that extend beyond the immediate property where the drilling occurs. Davis argues that increasing federal bonding requirements could help set the stage for state action by serving as an example for state officials. For instance, many energy experts believe that federal fracking regulations requiring the disclosure of chemicals used will serve as a template for state-level regulation. States would, of course, continue to be able to impose bonding requirements that exceed the federal minimums.

This is already an active area for state legislation. Several states are considering or have passed legislation that strengthens bonding requirements. For example, the West Virginia and Pennsylvania legislatures have passed bills raising bond requirements, and similar proposals to strengthen bond requirements are being debated in the Maryland legislature. Table 1 summarizes existing federal and state regulations. At the federal level, minimum bond requirements mandate just \$10,000 per lease—on average just \$2,000 per well. At the state level, bonding requirements tend to be lower than Davis recommends, but vary widely. Louisiana, a state with substantial proven reserves, has no explicit bonding requirements. Kentucky and Ohio have minimum bond requirements below \$10,000, while Arkansas allows bonds up to \$100,000; New York, which currently has a moratorium on fracking, has minimum bonds up to \$250,000 per well. These state amounts have been set at different times, and many will need to be updated to account for inflation and to better reflect risks associated with fracking.

## D. Eliminate Blanket Bonds

The Bureau of Land Management and most state regulatory agencies allow natural gas producers to satisfy bonding requirements by posting “blanket” bonds, a maximum amount that allows producers to cover all of their active wells (see column 4 in Table 1). Currently, federal laws allow producers to post a \$25,000 bond for all drilling on federal land in a given state, or a \$150,000 bond for all drilling nationwide on federal land. Among states that allow drillers to post a blanket bond, the median bond amount is \$100,000.

Davis proposes eliminating the use of blanket bonds because they can lead to an unreasonably low average bond amount per well. Large companies with widespread drilling operations can post a single bond which covers hundreds or even thousands of wells, reducing the economic incentives to drill responsibly and adequately reclaim sites.

## Roadmap

The author proposes updating bonding requirements at the federal and state levels, in light of new risks specific to hydraulic fracturing by the natural gas industry.

- As a first step for implementing this proposal, Congress should update bonding amounts, last set in 1960, for drilling on federal lands and other lands under Bureau of Land Management (BLM) authority.
- Davis suggests a minimum bond amount of \$60,000 per lease should apply to all oil and gas drilling, which merely updates minimum bonding amounts to account for inflation.
- For wells in which hydraulic fracturing is used, drilling companies should be required to post higher bonds, increasing the total bond amount for fracked wells. Policymakers could choose to double the required minimum bond amount, relative to the minimum for traditional wells.
- States should be encouraged to update their own bonding requirements to account for inflation and to reflect specific risks faced by drilling in their state.
- Congress should maintain the authority of the U.S. Environmental Protection Agency to continue to assess risks. As new information emerges about the potential environmental damages from fracking, state and federal environmental agencies should work together to assess risk and revise their bonding policies as appropriate.

## Learn More About This Proposal

This policy brief is based on The Hamilton Project discussion paper, Modernizing Bonding Requirements for Natural Gas Producers, which was authored by

LUCAS DAVIS

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## Additional Hamilton Project Proposals

### Leveling the Playing Field for Natural Gas in Transportation

CHRISTOPHER R. KNITTEL

Petroleum dominates the U.S. transportation sector, but growing concerns about U.S. energy security and about the environmental effects of oil have increased pressures to find alternative sources of energy for transportation. Domestic natural gas is cleaner than oil, cheaper than oil, and contributes to energy security, making it an increasingly attractive and practical alternative. This paper offers a set of policy proposals designed to remove obstacles that prevent increased utilization of natural gas in transportation. The paper proposes that policymakers should provide support for natural gas refueling infrastructure and should create incentives for natural gas use that are aligned with its environmental and energy security benefits.

### A Strategy for U.S. Natural Gas Exports

MICHAEL LEVI

Increased natural gas production in the United States has caused domestic natural gas prices to plummet in recent years. Ample domestic production capacity and higher natural gas prices in foreign natural gas markets place the United States in an ideal position to export natural gas overseas. Indeed, several applications to export natural gas are awaiting review at the Department of Energy. This paper proposes a framework for regulators to use in order to evaluate if applications to export natural gas are in the public interest. The paper then utilizes its proposed framework to conclude that the benefits to the United States of natural gas exports would outweigh the costs, suggesting that the federal government should approve applications for exports. The paper also offers broader policy recommendations aimed at using U.S. natural gas export policy to advance the nation's foreign policy and trade goals.

Where the blanket bond is especially problematic is when the company goes into bankruptcy. In many cases, companies have gone bankrupt leaving a large number of orphaned wells. For example, in 2001 Emerald Restoration and Production Company went bankrupt, leaving 120 wells that needed to be plugged and the sites reclaimed. The company had posted a \$125,000 bond, but this was not nearly enough to pay for the expenses. To date more than \$2 million has been used in public funds for this cleanup.

## Costs and Benefits

Increasing minimum bond amounts would have a small impact on total natural gas production. For a bond set at \$60,000 per lease (approximately \$12,000 per well), which is the bond amount proposed by Davis for federal lands, this would mean about \$216 million placed annually into bonds. This is not a small amount, but it is modest compared to the more than \$100 billion natural gas market, approximately one third of which now comes from shale gas. Moreover, most producers could expect to get these funds back with accrued interest, so the costs are low if appropriate care is taken throughout the recovery process.

Higher bonds would raise the cost of drilling and lead to lower profits for drillers and higher prices for consumers. These costs should be compared to the potential benefits. Given how little is known about the environmental costs of hydraulic fracturing, it is difficult to quantify these benefits with certainty. However, even one instance of groundwater contamination avoided could save hundreds of millions of dollars in damages in addition to better protecting American consumers. Moreover, strengthened bonding requirements will help to ensure that drilling sites are returned as close as possible to their original conditions. These benefits, also difficult to quantify, might be worth tens of thousands of dollars per drilling site. Finally, if states choose higher bond requirements that encourage producers to take proper precautions, this could help improve public perception of fracking at a time when public concern is high.

## Conclusion

Recent developments in the natural gas industry have the potential to revolutionize the U.S. energy market. However, the new technologies and the market structure of the industry present new environmental risks. The stronger bonding requirements that Davis proposes would ensure that funds would be available to clean up sites when accidents occur. More importantly, stronger requirements would also motivate producers to work hard to avoid environmental damages altogether and provide greater assurances to the public about the safety of natural gas extraction.

# Questions and Concerns

## 1. Why not mandate insurance instead?

Insurance is effective for ensuring that funds are available when accidents occur, but because of opportunities for firms to declare bankruptcy, it is not feasible to fully align incentives through experience rating. While mandated insurance should not be used as a substitute for bonding requirements, it could serve as a valuable complement by providing a mechanism for addressing catastrophic environmental accidents that impose costs that exceed the amount of the bond. A hybrid plan could involve both substantially increasing minimum bond amounts and requiring producers to purchase insurance for damages that exceed the amount of the bond. Hybrid policies can be likened to car insurance policies with high deductibles. Because the deductible is out of pocket, drivers are more careful with their cars than they might be. The bond with insurance works in much the same way. With a bond in place, the producer has some of its own money at stake and so although it does not bear the full cost of a worst-case outcome, the bond increases the incentive to make responsible choices.

## 2. Will stronger bonding requirements reduce U.S. natural gas production?

Yes, but not by very much. This proposal is most likely to stop companies from starting risky projects where there are environmental risks (for example, at drilling sites near important sources of groundwater). Increasing the bonding requirements increases the expected costs of these projects more than other projects because producers take into account the increased risk of losing the bond. From the producer's perspective, these are more expensive projects. But this is the objective of this policy: to provide incentives for producers to choose more environmentally safe projects. If the social costs of these projects are too high, producers will be discouraged from initiating them.

## 3. What happens when a well is sold?

Federal and state law determines what happens when there are changes in well ownership. Bonds stay with wells, not producers, so when a well is sold, the ownership of the bond transfers at the same time, and there is no lapse in bond coverage. In bankruptcy the bonds cannot be used to pay off generic company debts, until such time that the funds are returned according to the normal rules for returning bonds. Bonds are returned after a well has finished production.

## Highlights

Lucas Davis of the University of California, Berkeley, proposes increasing existing federal and state bonding requirements to reflect the new risks specific to recent technological developments and the market organization of the natural gas industry.

## The Proposal

### A. Increase Bonding Requirements for All Drilling on Federal Lands

For drilling on federal lands, Davis proposes adjusting the minimum bond values last set in 1960 for inflation, raising them to \$60,000.

### B. Impose Higher Bonds for Fracked Wells

Davis also proposes higher bond amounts when fracking is used, to be set at an amount that is commensurate with the risk and scope of potential environmental damages and large enough to alter driller behavior to take proper precautions. Doubling required minimum bond amounts relative to the minimum for traditional wells, for example, would probably make sense given the higher level of environmental risks and higher expected costs of reclaiming these well sites.

### C. Encourage States to Increase Bond Amounts

Many states have bonding requirements. Davis argues that these should first be updated for inflation. Following the federal model, states should also update bonding amounts to reflect risks associated with fracking.

### D. Eliminate Blanket Bonds

Davis proposes to eliminate blanket bonds. These act as a liability cap and are particularly problematic in cases of bankruptcy.

## Benefits

The objective of Davis' policy is to provide incentives for producers to choose more environmentally safe projects and to follow appropriate safety procedures while drilling. If the social cost of these projects is too high, then producers should be discouraged from initiating them. Increased bonding requirements would shift projects from risky locations to sites where potential social costs are smaller.



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