

# The Fracking Debate

## A Policymaker's Guide

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Concerns about hydraulic fracturing are behind many states' reluctance to tap the economic benefits created by natural gas development. Hydraulic fracturing—"fracking"—is an oil and gas extraction method that uses hydraulic pressure to break up rock. Millions of gallons of pressurized liquids, usually a water-based mixture of sand and chemical additives, are pumped deep underground to help release trapped gas.

This report provides an introduction to the domestic natural gas picture, explores the motivation behind state legislative involvement in fracking regulation, and summarizes state legislation that is being developed to address environmental concerns.

### Hydraulic Fracturing: The 2012 Debate

Fracking allows access to previously inaccessible resources, such as shale gas, which is making up an increasingly large portion of the overall energy supply in the United States.

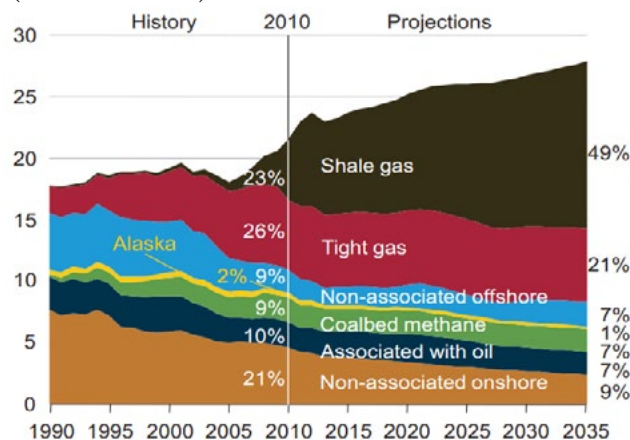
Combined with recent advances in horizontal drilling, the technology has opened up resources that, only a decade ago, were too expensive to develop. Some forecast that this increase in supply could sustain current U.S. consumption levels for another 90 years. Rapid expansion of hydraulic fracturing in densely populated regions where the process is unfamiliar, however, has focused attention on its potential to affect public health and the environment.

### Domestic Resource and Production Projections

Cumulative natural gas production from 2010 through 2035 is projected to be 7 percent higher than expected just a year ago.<sup>1</sup> This is mainly due to technological advances in hydraulic fracturing that now make shale gas more accessible. According to the U.S. Energy Information Administration (EIA), shale gas production alone will increase nearly threefold from 5.0 trillion cubic feet in 2010 to 13.6 trillion cubic feet in 2035. This equates to 23 percent of total U.S. dry gas production in 2010 and 49 percent of total U.S. dry gas production in 2035 (Figure 1).

The EIA expects domestic natural gas production to exceed consumption early in the next decade. By 2016, the United States is projected to become a net exporter of liquefied natural gas (LNG) and an overall net exporter of natural gas by 2021.<sup>2</sup>

Figure 1. U.S. Natural Gas Production, 1990-2035 (trillion cubic feet)



Source: U.S. Energy Information Administration, Annual Energy Outlook 2012 Early Release Overview.

#### Contents

<b>Hydraulic Fracturing: The 2012 Debate</b> .....	1
Domestic Resource and Production Projections.....	1
Low and Stable Prices, for Now.....	2
Economic Benefits: Impact Studies and Their Omissions ...	2
Public Health and Environmental Concerns.....	3
<b>States Take Action: The Balancing Act</b> .....	4
2012 Legislative Trend Overview.....	4
<b>State Policy Actions</b> .....	5
Generating Revenue.....	5
Increasing Transparency.....	6
Water Quality Protection .....	6
Monitoring to Improve Knowledge Base .....	7
<b>Federal Action</b> .....	8
<b>Outlook</b> .....	8
<b>Appendix</b> .....	9
<b>Notes</b> .....	18

## Low and Stable Prices, for Now

Natural gas prices, like most commodity prices, are driven by market forces.

On the supply side, production levels, net imports and storage levels affect prices. Increasing supply can help to lower prices. Demand is determined by economic growth, extreme weather and crude oil prices.

*The EIA projects that the United States could become an LNG net exporter by 2016.*

Historically, natural gas prices have been volatile and often high. Unpredictable fluctuations were a major drawback to heavy reliance on natural gas as prices hovered between \$3 and \$13 per 1,000 cubic feet of natural gas.

Increased production and expanded domestic supplies are expected to help sustain low and stable prices, however. The EIA projects average annual wellhead prices will remain below \$5 per 1,000 cubic feet through 2023 as industry taps into the expansive resources. After 2023, prices are expected to steadily increase as the number of tight gas and shale gas wells drilled increase and meet demand, rising to \$6.52 per 1,000 cubic feet in 2035.

Energy companies are reacting to low natural gas prices by curtailing dry gas production in order to pursue more profitable resources. Chesapeake Energy, for example, announced that it will reduce production by 8 percent of its current gross gas production and cut dry gas drilling expenditures from \$3.1 billion (2011) to \$900 million in 2012.<sup>3</sup> Continued cuts in production could reduce supply and drive up prices.

## Economic Benefits: Impact Studies and Their Omissions

Extracting natural resources can produce significant economic benefits for state and local economies. From manufacturing to the wellhead, the industry contributes to job creation, capital expenditures, gross domestic product (GDP) and tax revenues, and it creates savings through lower natural gas and electric power prices.

According to an industry-supported study by IHS Global Insight, the shale gas industry supported 600,000 jobs nationwide in 2010. The study indicates that shale gas production contributed \$18.6 billion in federal, state

and local government taxes and federal royalty revenues in 2010. It also projects that savings from lower natural gas prices will equate to an annual average of \$926 per year in disposable household income between 2012 and 2015.<sup>4</sup>

Some argue that the above report omits many vital factors that must be considered in a true cost-benefit analysis. To fully assess the overall long-term economic impact of any industry, a wider range of questions must be addressed, such as benefit allocation, public costs and impacts on existing industries. Furthermore, the most up-to-date production data must be used.

## Inflated Estimates

The EIA nearly cut its estimate of unproved recoverable reserves of shale gas in half in the past year, so many studies that use these old data produce inflated economic benefit figures.

In addition, as drilling companies respond to low natural gas prices and invest less capital in dry natural gas, and if the United States becomes a natural gas exporter, prices likely will increase. Although this prospect should be considered, many studies base estimates on the assumption that prices will remain very low for decades. If prices are not as low as assumed, then household disposable income savings will not be as high.

*Economic impact studies must consider the possibility of higher prices resulting from less industry investment and lower supply estimates.*

Many studies also indicate job creation figures as “total jobs,” which include direct, indirect and induced jobs. This can be misleading, since it does not reflect only newly created jobs. Although the IHS study estimates that the shale gas industry supported 600,000 jobs in 2010, the Bureau of Labor Statistics reported that the entire U.S. oil and gas extraction industry supported about 186,000 jobs in 2011.

## Local and Regional Long-Term Impacts

*Short-term industry booms could result in long-term busts.*

While many studies focus on the “big picture,” they do not account for local impacts that may vary by region. Rural areas tend to experience short-term booms as extraction industries move in, then experience long-term busts.

Reduced economic diversity, higher unemployment and wider income disparities often ensue once industry leaves. Such long-term impacts also should be considered.

Some studies also focus mainly on economic contributions rather than on a cost-benefit economic analysis. It is important to incorporate direct and consequential costs such as long-term health and environmental costs, as well as the possibility of future economic development losses if land is ruined by new pipeline infrastructure.

### *Job Distribution and Induced Benefits*

Many studies highlight the immense job creation potential that shale gas development creates; however, trained workers sometimes come from other states rather than from a state's existing job pool. Since these workers may be displaced only temporarily, a portion of the earned income may not be spent in the local community.

### *Local Industries and Costs to Communities*

Despite the local induced benefits, addition of a new industry also could negatively affect existing local industries. Agriculture, organic farming, fishing and hunting could be affected by water contamination or other habitat disturbances.

Increased demand for services—such as first responders, road maintenance and local hospitals—must also be considered as a cost to local communities.

### *The Alternatives*

Every true economic analysis must consider the alternative actions that could maximize benefits or minimize costs. One consideration is that investment in shale gas development could reduce investment in alternative energy resources.

### *Public Health and Environmental Concerns*

Although fracking to develop natural gas offers many benefits to state and local economies, its rapid expansion near densely populated areas has increased attention to its effects on human health and the environment. Cases of water contamination have been linked to high-volume hydraulic fracturing, including inci-

dences of spills, leaks and seepage of contaminants into drinking water supplies.<sup>5,6</sup>

### *Fracking Fluid Spills and Leaks*

One growing concern is contamination of public drinking water. Fracking fluid could contain hazardous chemicals and, if mismanaged, spills could leak harmful substances into groundwater or surface water.

### *Water Withdrawals*

Fracking treatments also require large amounts of water, and horizontal wells require even more than vertical wells. Significant water withdrawal could affect aquatic habitats or water availability.

### *Wastewater*

Hydraulic fracturing produces wastewater that must be treated properly before it is disposed. Treatment and disposal remain a regulatory challenge.

### *Air Quality*

Air quality and climate change also are concerns. Natural gas is efficient and clean compared to other fossil fuels, and although it emits less carbon dioxide than coal or refined petroleum products, burning natural gas still produces carbon dioxide and nitrogen oxides. During the drilling process, chemicals such as benzene and methane also are released. According to the U.S. Environmental Protection Agency (EPA), natural gas systems remain one of the most significant methane emitters in the United States.

### *Surrounding Habitat*

Increased exploration and development also affects surrounding habitat and wildlife. Vegetation and soils may be disturbed because gas wells can require new roads, clearing and leveling.

### *Seismic Activity*

Recent seismic activity in Ohio and Oklahoma are drawing attention to a possible link between earthquakes and deep wells used to dispose of hydraulic fracturing wastes.

## States Take Action: The Balancing Act

Hydraulic fracturing remains controversial in state legislatures, and the debate has turned into a balancing act. Policymakers who are responsible for ensuring that regulations are in place to protect the environment and public health, also recognize the revenue potential the industry could bring to state and local economies.

As of March 2012, at least 137 bills in 24 states have been introduced this session that address hydraulic fracturing (Figure 2). At least six states—Indiana, North Carolina, Pennsylvania, South Dakota, Tennessee and Utah—have enacted legislation.

### 2012 Legislative Trend Overview

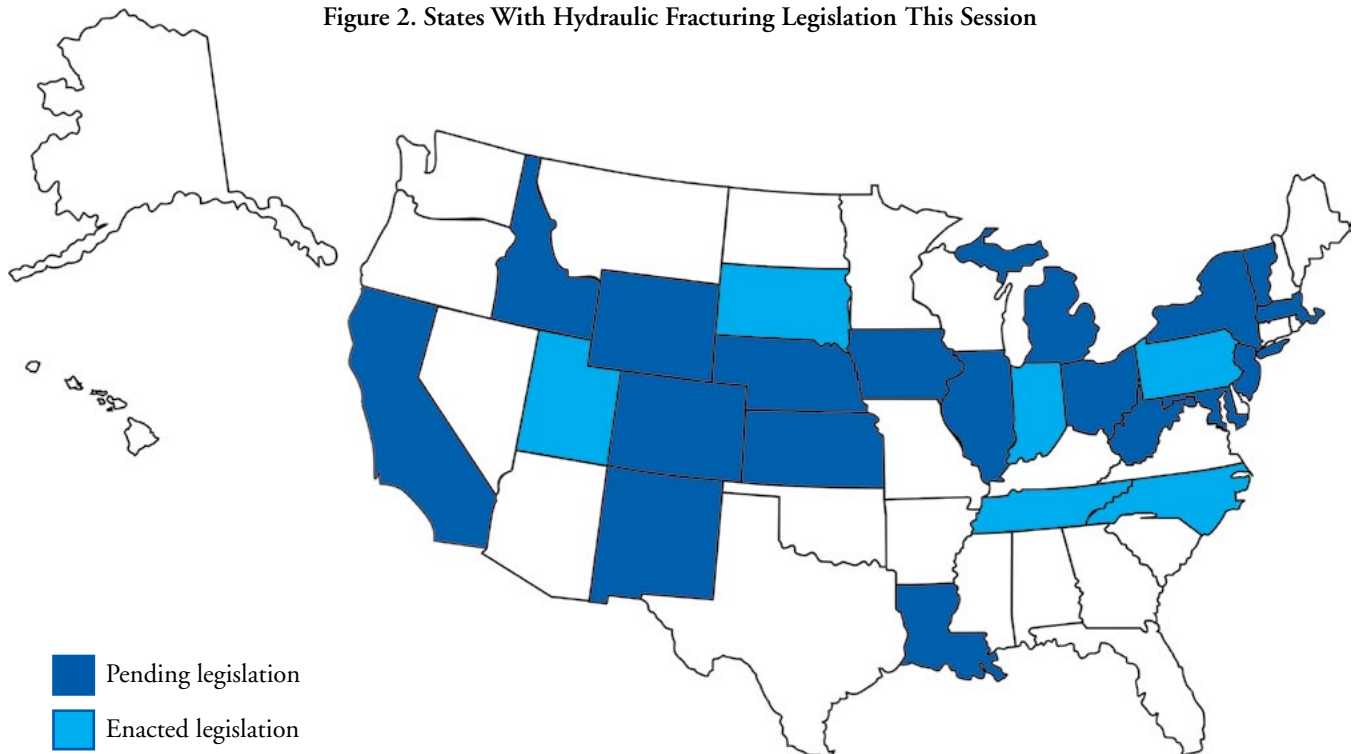
State legislatures are actively working to alleviate public health and environmental concerns while also taking advantage of the economic potential offered by shale gas development. Specific proposals include severance tax structure changes; impact fees; well spacing requirements; set-back requirements; waste treatment and disposal regulations; and requirements to publicly dis-

close the names and/or composition of fracturing fluid chemicals.

So far this session:

- At least 16 states have proposed chemical disclosure requirements (see Table 1 in the appendix);
- At least 11 states have proposed casing, well spacing, setback, water withdrawal, flowback, waste regulation requirements, or other measures to protect water resources (see Table 2 in the appendix);
- At least 11 states have proposed legislation to impose new or amend existing severance taxes (see *Oil and Gas Severance Taxes: States Work to Alleviate Fiscal Pressures amid the Natural Gas Boom*);
- At least nine states have proposed hydraulic fracturing suspensions, moratoria or studies to investigate fracking impacts (see Table 3 in the appendix); and
- At least seven states have proposed resolutions addressing hydraulic fracturing (see Table 4 in the appendix).

Figure 2. States With Hydraulic Fracturing Legislation This Session



Source: NCSL research as of March 26, 2012.



## State Policy Actions

### Generating Revenue through Severance Taxes and Impact Fees

States can use many avenues to generate revenue to help balance state budgets, fund environmental conservation projects and alleviate the impacts on local communities.

#### 1. Severance Taxes

Most natural gas-producing states have some form of severance tax. Severance taxes are excise taxes on resources that are “severed” from the earth, and such tax structures vary across the states. Severance taxes help ensure that the costs associated with resource extraction are paid by the producers, alleviating some of the potential impacts on state and local taxpayers.

At least 36 states impose some sort of severance tax, and 31 states specifically levy taxes on oil and gas extraction (Figure 3). Pennsylvania remains the largest natural gas-producing state that has no severance tax, which some argue has already cost the state more than \$300 million in lost revenue.<sup>7</sup> In 2010, more than \$11 billion was generated in the United States from severance taxes alone, and in at least six states—Alaska, Montana, New Mexico, North Dakota, Oklahoma and Wyoming—be-

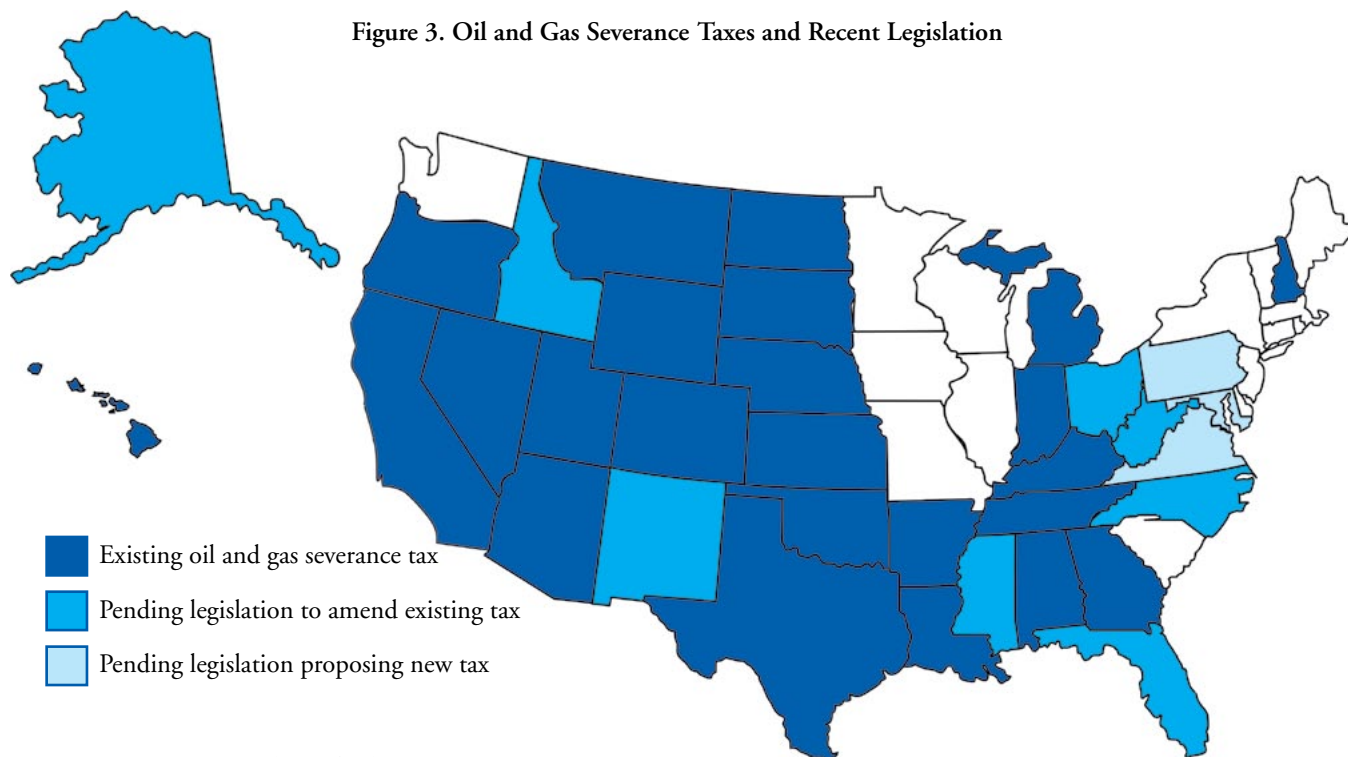
tween 10.5 percent and 74.3 percent of total state tax revenue came from severance taxes.<sup>8</sup>

At least 11 states are considering legislation to impose new or amend existing oil and gas severance taxes so far this session. (See *Oil and Gas Severance Taxes: States Work to Alleviate Fiscal Pressures amid the Natural Gas Boom* for 50-state charts that detail existing severance tax rates and structures, and pending state legislation that would impose new—or amend existing—oil and gas severance taxes.)

Historically, severance taxes have been the source of a significant stream of revenue for energy-rich states, but record low natural gas prices have reduced how much is generated in states that base the tax on the value of gas. Revenues are plummeting, and some states are scrambling to subsidize the lost income.

#### 2. Impact Fees

States also can impose impact fees to generate revenue. Instead of creating a severance tax, Pennsylvania legislators enacted H.B. 1950 (February 2012) to implement an impact fee based on the average price of natural gas in the preceding year. It is capped at \$355,000 per well during a 15-year period. The new law aims to benefit local communities that are affected by drilling.



Source: NCSL research as of Feb. 15, 2012.

## Increasing Transparency

### 3. Fracking Fluid Chemical and Additive Disclosure

The most frequently addressed legislative trend this session is to require disclosure of fracking fluid chemical and additives. Wyoming was the first state in June 2010 to approve rules requiring public disclosure of the chemicals in fracking fluid. In 2011, Texas was the first to enact legislation (H.B. 3328). Colorado's rule is the most comprehensive to date. It requires drillers to disclose not only chemical names, but also their concentrations.

States also are working to protect industry trade secrets, in an attempt to address both industry and transparency needs. In Colorado, for example, drillers can claim a chemical as a trade secret, but the ingredient's chemical family name must be disclosed. More detail must be disclosed if trade secret information is requested by regulators or medical professionals in special circumstances.

Figure 4 illustrates the states that have disclosure requirements (determined either by legislation or rule), are introducing new legislative requirements, or are proposing changes to existing requirements through legislation.

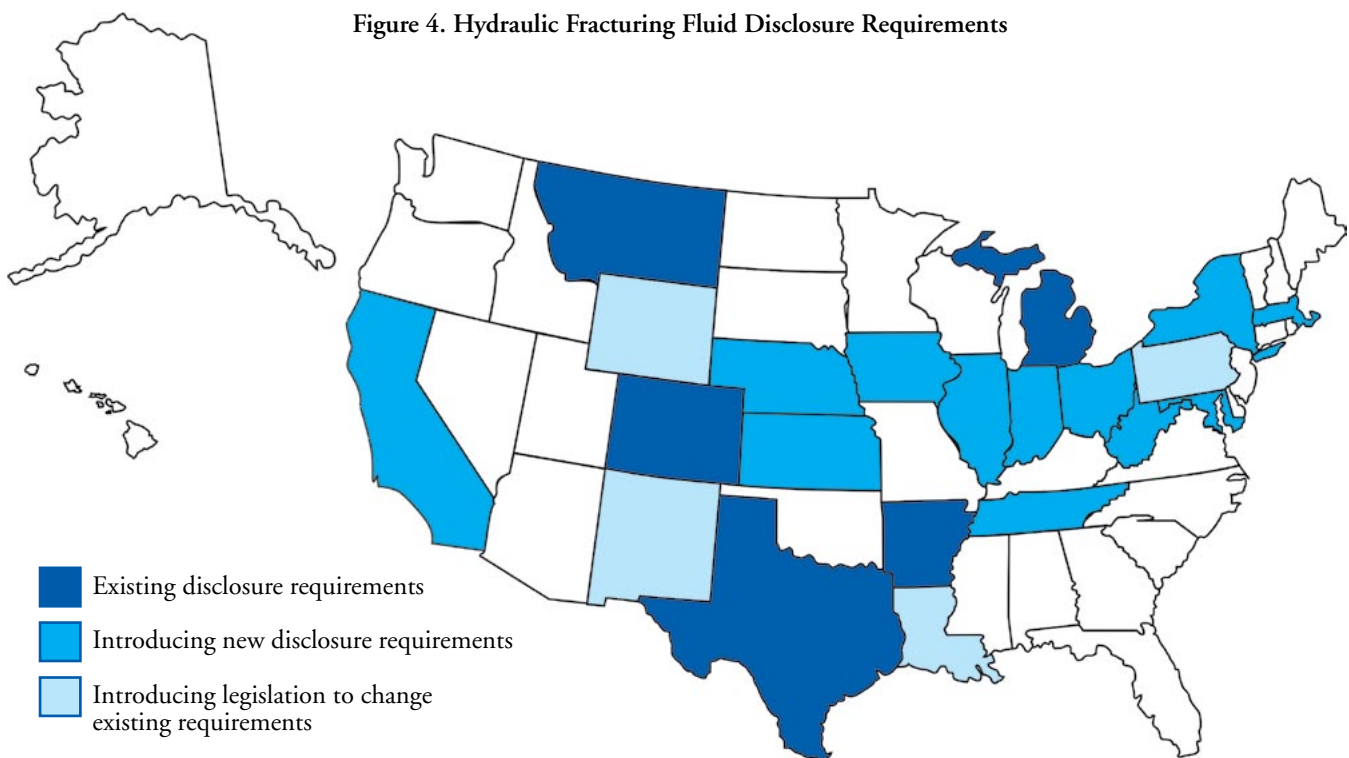
Table 1 in the appendix contains a detailed chart of pending legislation.

### Water Quality Protection

State legislatures are taking a number of steps to help protect water quality by creating well location, water withdrawal, flowback, waste regulation, or casing and mechanical integrity requirements. Table 2 in the appendix details legislation so far this session.

### 4. Spills and Leak Prevention Through Mechanical Integrity Tests or Casing Requirements

Recent research released by the Energy Institute at the University of Texas did not find a direct link between hydraulic fracturing and groundwater pollution problems. Rather, above-ground spills, leaking drill casings,



Source: NCSL research as of March 26, 2012.

and wastewater mishandling of may be more common causes of groundwater pollution. Possible solutions could include more stringent regulation of drill casings or other mechanical integrity measures to prevent spills or leaks.

Pending H.B. 3897 in Illinois, for example, would require integrity tests of casing or other mechanical testing prior to hydraulic fracturing. New York's pending A.B. 6540 would require certificates of competence to use a derrick or other drilling equipment, and a few pending bills in Pennsylvania (S.B. 425, H.B. 971 and H.B. 1645) address casing requirements.

### ***5. Wastewater Transportation Requirements***

Concern exists about possible spills during waste transportation after a hydraulic fracturing treatment, and some states are taking steps to help mitigate associated health risks. Pennsylvania's pending H.B. 1741, for example, would require vehicles to display a placard on the outside of the vehicle indicating it is carrying hydraulic fracturing wastewater.

### ***6. Regulations for Treating and Disposing Waste***

Waste treatment and disposal remain challenges, and some states are working to address these issues through legislation. Illinois' pending H.B. 3897, for example, addresses disposal and reuse of well stimulation fluid that is recovered during flowback and S.B. 3280 addresses storage of fluids. Maryland's pending H.B. 1170 would require disclosure of the amount of water used, flowback and drilling waste, and two pending bills in New Jersey (A.B. 575 and S.B. 253) would prohibit treatment, discharge, disposal or storage of wastewater in the state.

In New York, A.B. 6488 (pending) would require treatment works to refuse industrial waste from fracking operations that contain high levels of radium. Waste must be tested for radioactive containments, and the bill would provide for scheduled discharges of wastewater. Pending legislation in West Virginia, H.B. 4265, would require flowback plans for all oil and gas wells, including recordkeeping and reporting of flowback.

### ***7. Well Location Restrictions***

A number of states are considering well setbacks or location restrictions to create buffers between drilling and public drinking water resources. In Colorado, pending

S.B. 107 would prohibit hydraulic fracturing within a half mile of any surface water. New York's pending A.B. 4237 and S.B. 1230 would prohibit drilling within 10 miles of the New York City water supply infrastructure. A few pending bills in Pennsylvania address well spacing or location restrictions. H.B. 230, for example, would prohibit drilling within the surface or subsurface area of, or using hydraulic fracturing or horizontal drilling within, 2,500 feet of any primary source of a community water system.

## **Monitoring to Improve Knowledge Base**

### ***8. Water Withdrawal Monitoring***

Since water supply is threatened in some regions, state legislatures can opt to regulate water withdrawals. In California, A.B. 591 (pending) would require the amount and source of water used in hydraulic fracturing to be recorded. Pending legislation in New York (S.B. 1234) also would regulate water withdrawals, and A.B. 6426 would require permits for water withdrawals of more than 5,000 gallons.

### ***9. Water Quality Monitoring***

Some argue that insufficient data exist to compare water quality of nearby sources before and after hydraulic fracturing. Water quality monitoring may help improve knowledge of how hydraulic fracturing affects water supplies and quality. In Colorado, pending S.B. 107 would require operators not only to report the amount of water used, but also to collect water quality samples before operations begin from all active water wells within a half mile of an oil and gas well. Water samples also would be collected at various stages following well completion.

### ***10. Drilling Moratoria***

Some states are aiming to put the industry on hold until more is known about the effects of hydraulic fracturing. Michigan's pending H.B. 5150, for example, would prohibit hydraulic fracturing under certain circumstances until a specified advisory committee makes recommendations. New Jersey enacted legislation (S.B. 2576, A.B. 3313 and A.B. 3653) to prohibit hydraulic fracturing in the state. In New York, pending A.B. 5547 would establish a moratorium until 120 days after the U.S. EPA issues its report on the effects of a fracking treatment. Table 3 in the appendix contains a chart of pending legislation.

## Federal Action

At the federal level, hydraulic fracturing is exempt from the underground injection control program requirements set forth in the Safe Drinking Water Act. Congress has considered legislation—known as the FRAC Act—that would have removed this exemption and would have required public disclosure of chemicals used in fracking treatments.

Table 4 in the appendix outlines state resolutions that address state versus federal regulation of hydraulic fracturing.

In May 2011, Secretary of Energy Chu asked an advisory board subcommittee to make recommendations to improve the safety and environmental performance of hydraulic fracturing. The subcommittee held several public meetings throughout 2011 and released its final report in November 2011.

The report focuses on implementation of 20 recommendations for reducing the environmental impacts from shale gas production. It stresses the importance of using best practices in measurement and public disclosure, improving air quality, protecting water quality and disclosing hydraulic fracturing fluid components.

In February 2012, the U.S. Department of Interior released draft regulations that would require operators on public lands to seek approval to conduct hydraulic fracturing and disclose the chemical ingredients of proposed fracking fluid, but trade secrets are protected. The proposal also would require operators to outline a record-keeping method and would require a mechanical integrity test of the casing prior to well stimulation.

The U.S. EPA also is investigating the potential effects of hydraulic fracturing on drinking water resources. Initial study results should be released by the end of 2012, followed by a final report in 2014.

## Outlook

Shale gas has transformed the domestic energy outlook. The industry offers tremendous economic benefits, but states are working to ensure that the gas is extracted safely, especially in densely populated regions.

In 2012, fracking will continue to be debated and the top legislative trends will likely be in fracking fluid disclosure and monitoring. Many states also will consider how to treat and dispose of waste to protect water sources; improve drill casing and well spacing requirements to prevent spills and leaks; and consider severance tax changes to help fund environmental projects and balance state budgets.



## Appendix

**Table 1. Legislation Proposing Disclosure Requirements**  
(as of March 26, 2012)

<b>State</b>	<b>Bill</b>	<b>Status</b>	<b>Description</b>
<b>California</b>	A.B. 591	Pending	Would require a person carrying out hydraulic fracturing on behalf of an owner or operator to provide to the owner a list of the chemical constituents used in the fluid. The amount of recovered fracking fluid and other procedural elements also must be recorded. The information must be made available to the public.
<b>Iowa</b>	S.B. 2175	Pending	Would require a list of all chemicals and additives to be submitted to a specified department. Would require certification that the chemicals will not cause or induce cancer or pose other threats, and the information must be posted on a public website.
<b>Illinois</b>	S.B. 2058	Pending	Would require fluid identity by additive type and chemical compound names; the Chemical Abstracts Service (CAS) numbers must be reported to a specified department.
	H.B. 3897	Pending	Would require chemical disclosure information to be posted on a website.
	S.B. 3280	Pending	Would require chemical disclosure information to be posted on a website.
	H.B. 5853	Pending	Would require operators to complete forms that include the total volume of water used in hydraulic fracturing a well and each chemical ingredient.
<b>Indiana</b>	H.B. 1085	Failed – adjourned	Would require chemical constituents to be disclosed on a public website. The composition must be disclosed if a medical emergency exists and the information about a proprietary chemical or composition of a treatment is necessary in order to provide medical care.
	H.B. 1107	Enacted	Requires the Natural Resources Commission to adopt rules addressing reporting and disclosure of hydraulic fracturing treatments. Requires volumes of additives to be disclosed as a maximum percentage of the total fracturing fluid volume.
<b>Kansas</b>	H.B. 2526	To Governor	Would allow a commission to promulgate rules addressing hydraulic fracturing disclosure.
	H.B. 2642	Pending	Relates to disclosure requirements.
<b>Louisiana</b>	H.B. 957	Pending	Would provide for the disclosure of the composition of hydraulic fracturing fluids.
<b>Massachusetts</b>	H.B. 3055	Pending	Would require hydraulic fracturing fluids and volumes to be identified and described.
<b>Maryland</b>	H.B. 1170	Withdrawn	Would require natural gas drillers to maintain and update certain records, including lists of chemicals and concentrations, and to make the information publicly accessible.
<b>Nebraska</b>	L 877	Failed – indefinitely postponed	Would have required disclosure of fracking treatment information, including composition of fluids.
<b>New Mexico</b>	H.B. 187	Failed – adjourned	Would require disclosure of the composition of hydraulic fracturing fluids.

**Table 1. Legislation Proposing Disclosure Requirements (continued)**  
(as of March 26, 2012)

<b>State</b>	<b>Bill</b>	<b>Status</b>	<b>Description</b>
<b>New York</b>	S.B. 425 and A.B. 2922	Pending	Would require disclosure of all fluid chemicals used in hydraulic fracturing.
	S.B. 1234	Pending	Would require disclosure of components in fracking fluid.
	S.B. 3765	Pending	Would prohibit contracts that refer to hydraulic fracturing from containing provisions that would prohibit disclosure of chemicals used in the process.
	A.B. 6426	Pending	Would require disclosure of hydraulic fracturing materials.
	S.B. 5879 and A.B. 8805	Pending	Would require disclosure of the composition of hydraulic fracturing fluids to the Department of Environmental Conservation. Additive and chemical concentrations must be disclosed and expressed as pounds per 1,000 gallons or gallons per 1,000 gallons, and expressed as a percentage by volume of the fracturing fluid used.
	<b>Ohio</b>	S.B. 212	Pending
<b>Pennsylvania</b>		S.B. 127	Pending
	S.B. 425 and H.B. 971	Pending	Would require fluid volumes to be reported to a department that must make the report available to the public upon written request.
	H.B. 1680	Pending	Would require fracking fluid disclosure to a specified department. Chemical constituents must be disclosed, but not proprietary chemical formulas. The information must be made available to the public. If a medical emergency exists and the proprietary chemical formula or specific identity is necessary for treatment, then it must be disclosed.
	S.B. 1226	Pending	Would provide for disclosure of the composition of hydraulic fracturing fluids and would require the information to be posted on a website.
	H.B. 24	Pending	Would require chemical ingredients to be disclosed.
<b>Tennessee</b>	H.B. 1950	Enacted	Requires disclosure of the chemicals used in hydraulic fracturing a well within 60 days of finishing a procedure. Chemicals must be publicly disclosed on a website and posted in a form that does not link the chemicals to their respective hydraulic fracturing additive.
	H.B. 3204 and S.B. 3127	Pending	Would establish a disclosure process if any injection is confidential or involves trade secrets.
<b>West Virginia</b>	H.B. 4266	Failed – adjourned	Would require material data safety sheets and documentation of tracking fluid components to be disclosed. Fracking fluid components would be reported to oil and gas well site workers, emergency responders and local emergency planning committees, and they would be posted on a website.
<b>Wyoming</b>	S.B. 60	Withdrawn	Would have required disclosure of fracking fluids.

**Table 2. Water Quality Protection - Casing Requirements, Well Spacing, Setbacks, Water Withdrawals, Flowback, Waste Regulation and More**  
(as of March 26, 2012)

<b>State</b>	<b>Bill</b>	<b>Status</b>	<b>Description</b>
<b>California</b>	A.B. 591	Pending	Would require the amount and source of water used to be recorded, as well as radiological components or tracers. The amount and disposition of water and hydraulic fracturing fluid recovered would have to be recorded.
<b>Colorado</b>	S.B. 107	Pending	Would require the amount of water used to be reported and would require operators to collect water quality samples before operations begin from all active water wells within a half mile of an oil and gas well. Water samples must be collected by the first, third and sixth anniversaries of drilling completion.
	H.B. 1173	Pending – Postponed Indefinitely	Would prohibit use, storage or disposal of hydraulic fracturing fluids or flowback from a treatment in an open pit. Requires use of a closed-loop system for treatments. Allows the commission to approve use of open pits where there is no risk to occupied structures or water sources.
	S.B. 107	Pending	Would enact the Water Rights Protection Act. Would prohibit hydraulic fracturing within a half mile of any surface water.
<b>Illinois</b>	H.B. 3897	Pending	Addresses disposal and reuse of well stimulation fluid recovered during flowback. Would require integrity tests of casing or of casing-tubing annulus, or other mechanical testing prior to hydraulic fracturing.
	S.B. 3280	Pending	Would require mechanical integrity tests prior to drilling. Addresses disposal of flowback and storage of fluids.
	S.B. 3534	Pending	Would require the total volume of water used to be posted to a website.
<b>Maryland</b>	H.B. 296	Pending	Would prohibit wastewater from hydraulic fracturing in another state to be shipped or transported, or stored, treated, discharged or disposed of in the state.
	S.B. 636 and H.B. 1123	Pending	Would establish presumptive impact areas and require permittees to replace water supply and repair damage if it occurs.
	H.B. 1170	Pending	Would require disclosure of the amount of water used, flowback, and drilling waste.
<b>Michigan</b>	H.B. 4736	Pending	Would create presumption of liability for contamination of groundwater caused by hydraulic fracturing fluids.
<b>New Jersey</b>	A.B. 575	Pending	Would prohibit treatment, discharge, disposal or storage of hydraulic fracturing wastewater in the state.
	S.B. 253	Pending	Would prohibit shipment, transport or treatment of hydraulic fracturing wastewater in the state.

**Table 2. Water Quality Protection - Casing Requirements, Well Spacing, Setbacks, Water Withdrawals, Flowback, Waste Regulation and More (continued)**  
(as of March 26, 2012)

<b>State</b>	<b>Bill</b>	<b>Status</b>	<b>Description</b>
<b>New York</b>	S.B. 425 and A.B. 2922	Pending	Would prohibit use of fluids that contain a chemical substance that poses a risk to human health and would require disclosure of all fracking fluid chemicals.
	S.B. 1234	Pending	Would aim to protect local resources, regulate water withdrawals and prohibit certain activities near watersheds.
	A.B. 2108 and S.B. 893	Pending	Would establish the Natural Gas Exploration and Extraction Liability Act of 2011.
	A.B. 3579	Pending	Would address expected water use, potential water conservation measures, fluid storage and disposal measures, and site-specific biological and water quality data.
	A.B. 4237 and S.B. 1230	Pending	Would prohibit drilling within 10 miles of the New York City water supply infrastructure.
	S.B. 3483 and A.B. 7986	Pending	Would require groundwater testing prior to and after drilling wells for oil and gas.
	A.B. 6426	Pending	Would prohibit natural gas drilling near watersheds and would require permits for water withdrawals exceeding 5,000 gallons. Would also require inspections and annual audits.
	A.B. 6488	Pending	Would require treatment works to refuse industrial waste from fracking operations that contain high levels of radium. Would require testing for radioactive containments and provide for scheduled discharges of wastewater.
	S.B. 4251 and A.B. 7283	Pending	Would require promulgation of regulations to require treatment works to test fracking waste and to test for radioactivity.
	A.B. 7071	Pending	Would direct the commissioner of the Department of Environmental Conservation to promulgate rules and regulations requiring that wastewater screening not harm sewage treatment works.
	A.B. 6540	Pending	Would require certificates of competence for using a derrick or other drilling equipment.
	A.B. 7987	Pending	Would prohibit wastewater treatment facilities from accepting wastewater from hydraulic fracturing operations unless they meet certain performance requirements.
<b>Ohio</b>	S.B. 212	Pending	Would address brine disposal, water use in state land drilling, royalties, waste documentation, and baseline testing of surface and groundwater before well drilling.



**Table 2. Water Quality Protection - Casing Requirements, Well Spacing, Setbacks, Water Withdrawals, Flowback, Waste Regulation and More** (continued)  
(as of March 26, 2012)

<b>State</b>	<b>Bill</b>	<b>Status</b>	<b>Description</b>
<b>Pennsylvania</b>	S.B. 127	Pending	Would address fracturing chemicals, surface impoundments and fluid monitoring. Would require operators to maintain records of the volume of fracturing fluids used for operations and the volume of fluids returned to the surface.
	H.B. 234	Pending	Would require the amount of production and waste generated by each well to be reported.
	S.B. 680	Pending	Would provide for location restrictions, water protection, use of surface impoundments for temporary flowback storage, well reporting requirements, and more.
	H.B. 1346	Pending	Would provide for well location restrictions and emergency preparedness plans.
	H.B. 1565	Pending	Would provide for chemical analysis of recycled wastewater during storage and of wastewater generated by oil and gas activities, and for electronic tracking of wastewater from oil and gas activities.
	H.B. 1741	Pending	Would address hydraulic fracturing wastewater transportation and require any vehicle carrying fracking wastewater to show placard on the outside of the vehicle.
	H.B. 1800	Pending	Would address water protection, use of surface impoundments and fracking fluids, emergency response, well reporting, bonding and a severance tax.
	H.B. 1887	Pending	Would address well location restrictions, groundwater protection, casing requirements, well reporting and more.
	H.B. 24	Pending	Would require operators to disclose total volume of water used and the chemical ingredients.
	H.B. 230	Pending	Would prohibit wells from being drilled within the surface or subsurface area of, or using hydraulic fracturing or horizontal drilling within 2,500 feet of a water well, lake, reservoir, impoundment, spring, etc. or anything that is the primary source for a community water system.
	H.B. 232	Pending	Would provide for well permits, well location restrictions, and disposal of wastewater requirements.
	H.B. 1211	Pending	Would provide for well spacing requirements.
	H.B. 1975	Pending	Would address water supply protection, wastewater, etc.
	S.B. 425 and H.B. 971	Pending	Would address well permits, well location restrictions, groundwater protection and casing requirements. Would also provide for fracking chemicals and surface impoundments, and fluid monitoring, and for use of surface impoundments for temporary flowback storage. Further, this bill would provide for bonding, penalties and well plugging funds.
	H.B. 1645	Pending	Would aim to protect fresh groundwater and water supplies and provide for casing requirements.
	S.B. 1100	Pending	Would amend impact fees, severance taxes, well restrictions, water supply protections, well reporting requirements, containment, transportation regulations, and more.
H.B. 1950	Enacted	Enacted new requirements addressing well location restrictions, water supply protections, well reporting requirements, bonding, penalties, civil penalties, containment, emergency response, and more.	

Table 2. Water Quality Protection - Casing Requirements, Well Spacing, Setbacks, Water Withdrawals, Flowback, Waste Regulation and More (continued)  
(as of March 26, 2012)

<b>State</b>	<b>Bill</b>	<b>Status</b>	<b>Description</b>
<b>Tennessee</b>	H.B. 3205 and S.B. 3125	Pending	Would establish groundwater protection standards.
<b>West Virginia</b>	H.B. 3042	Pending	Would modernize the oil and gas regulatory program and provide means to regulate horizontal drilling and use of water. Would also provide for record-keeping for all water used and flowback.
	H.B. 4066	Pending	Relates to groundwater contamination and spills.
	H.B. 4265	Pending	Would require flowback plans for all oil and gas wells. Would provide for record-keeping and reporting for all water used and flowback.
	H.B. 4386	Pending	Would require an emergency, temporary and permanent water supply when oil and gas operations result in contamination or interruption.

**Table 3. Legislation Proposing Moratoria or Impact Studies**  
(as of March 26, 2012)

<b>State</b>	<b>Bill</b>	<b>Status</b>	<b>Description</b>
<b>Illinois</b>	H.B. 3939	Pending	Would direct a department to adopt rules that prohibit hydraulic fracturing in designated state areas.
<b>Indiana</b>	H.B. 1085	Pending	Would provide for an environmental review of hydraulic fracturing, among other things.
<b>Michigan</b>	H.B. 5150	Pending	Would prohibit hydraulic fracturing under certain circumstances until the advisory committee makes recommendations.
	H.B. 5151	Pending	Would provide for a study of hydraulic fracturing by the Department of Environmental Quality.
<b>New Jersey</b>	A.B. 567 and S.B. 246	Pending	Would prohibit hydraulic fracturing.
	S.B. 247	Pending	Would establish a moratorium on hydraulic fracturing until certain conditions are met.
	S.B. 2576, A.B. 3313 and A.B. 3653	Enacted	Prohibits hydraulic fracturing for natural gas exploration or production in the state.
<b>New York</b>	A.B. 2924	Pending	Would require an Environmental Impact Statement to be prepared for any natural gas or oil drilling involving use of hydraulic fracturing.
	A.B. 4237 and S.B. 1230	Pending	Would establish a moratorium on permits for the drilling of wells.
	A.B. 5547	Pending	Would establish a moratorium until 120 days after the U.S. EPA issues its report on the effects of fracking.
	A.B. 5677	Pending	Would prohibit fracturing and horizontal drilling on land operated by the Office of Parks, Recreation and Historic Preservation and within one mile thereof.
	A.B. 6541	Pending	Would establish the Look Before You Leap Act of 2011, which would set a five-year moratorium on high-volume hydraulic fracturing and provide for an investigation.
	A.B. 300 and S.B. 6097	Pending	Would establish a moratorium on the disposal of fluids until 120 days after the U.S. EPA issues its report.
	A.B. 7172	Pending	Would create a temporary state commission on the economic benefits and costs of hydraulic fracturing in New York.
	S.B. 5592, A.B. 7400 and S.B. 6261	Pending	Would suspend hydraulic fracturing.
	S.B. 4220 and A.B. 7218	Pending	Would prohibit hydraulic fracturing.
	A.B. 9419	Pending	Would prohibit high-volume hydraulic fracturing in reforestation areas.

**Table 3. Legislation Proposing Moratoria or Impact Studies (continued)**  
(as of March 26, 2012)

<b>State</b>	<b>Bill</b>	<b>Status</b>	<b>Description</b>
	S.B. 6703 and A.B. 6541	Pending	Would enact a “Look Before You Leap Act of 2012” which would establish a 5-year moratorium on high-volume hydraulic fracturing.
	S.B. 6772	Pending	Would require a health impact assessment for horizontal drilling and high-volume hydraulic fracturing. Would also establish a moratorium on these activities until a final health impact assessment is implemented.
<b>North Carolina</b>	H.B. 773	Pending	Relates to statutory oversight studies, including hydraulic fracturing.
<b>Ohio</b>	H.B. 345 and S.B. 213	Pending	Would establish a moratorium on horizontal stimulation of wells until the U.S. EPA publishes its report and the chief of the Division of Oil and Gas Resources Management issues a report analyzing how Ohio’s rules address the issues that are raised in the EPA report.
<b>Pennsylvania</b>	H.B. 232	Pending	Would provide for a cumulative impacts study.
<b>West Virginia</b>	H.B. 4267	Pending	Would provide for studying the environmental and health impacts of shale gas development.



**Table 4. Hydraulic Fracturing Resolutions**  
(as of March 26, 2012)

<b>State</b>	<b>Bill</b>	<b>Status</b>	<b>Description</b>
<b>Kansas</b>	HCR 5023	Pending	Would urge Congress to permit the Kansas Corporation Commission to regulate hydraulic fracturing.
<b>Nebraska</b>	LR 504	Failed	Would allow for an interim study to examine statutes and regulations on hydraulic fracturing.
<b>New Jersey</b>	AR 112 and SR 98	Adopted	Urged enactment of the federal FRAC Act.
	SJR 13	Pending	Would urge Delaware, New York and Pennsylvania to enact moratoria against hydraulic fracturing until the U.S. EPA concludes its study and issues findings.
	SJR 22	Pending	Would urge Delaware, New York and Pennsylvania to join New Jersey in disapproving requests for withdrawing water for hydraulic fracturing and would enact bans on such practices.
<b>North Dakota</b>	HCR 3053a	Adopted	Urged Congress to clearly limit U.S. EPA regulation of hydraulic fracturing, under the Safe Drinking Water Act, to well stimulation treatments that use diesel fuel as the primary constituent of hydraulic fracturing fluid.
<b>Pennsylvania</b>	H.R. 296	Pending	Urges Congress to pass the FRAC Act.
<b>South Dakota</b>	HCR 1005	Adopted	Urged Congress to clearly delegate responsibility for regulating hydraulic fracturing to the states.
<b>Tennessee</b>	HR 98	Adopted	Encouraged meeting to propose regulations that would provide oversight for use of fracking as a method of modern natural gas extraction. The goal of the meeting would be to protect groundwater quality and drinking water supplies and land and mineral owner rights.
<b>Utah</b>	SCR 12	Enacted	Urged Congress to clearly delegate responsibility for regulating hydraulic fracturing to the states.

## Notes

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2. Ibid.
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4. IHS Global Insight, *The Economic and Employment Contributions of Shale Gas in the United States*, prepared for America's Natural Gas Alliance (Washington, D.C.: IHS Global Insight, December 2011); <http://anga.us/media/235626/shale-gas-economic-impact-dec-2011.pdf>.
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6. David Biello, *Hydraulic Fracturing for Natural Gas Pollutes Water Wells*, *Scientific American* (United States: Nature Publishing Group, May 2011); <http://www.scientificamerican.com/article.cfm?id=fracking-for-natural-gas-pollutes-water-wells>.
7. The Pennsylvania Budget and Policy Center, *Gas Drilling Tax Impasse Costs Pa. \$300 Million* (Harrisburg, Pa.: PennBPC, Jan. 31, 2012); <http://pennbpc.org/gas-drilling-tax-impasse-costs-pa-300-million>.
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