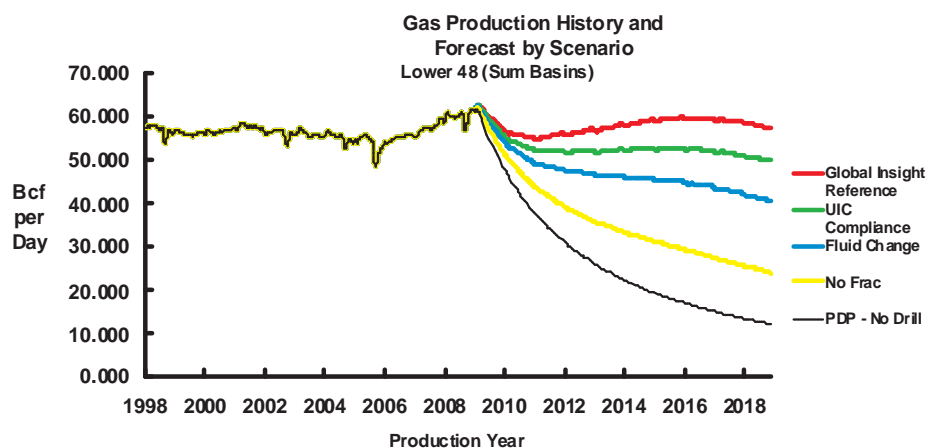


MEASURING THE ECONOMIC AND ENERGY IMPACTS OF PROPOSALS TO REGULATE HYDRAULIC FRACTURING

The American Petroleum Institute (API) has engaged IHS Global Insight to perform an independent study to determine the potential impact on future hydrocarbon production and on U.S. economic performance of proposed policy changes pertaining to hydraulic stimulation or fracturing of oil and gas wells. The study was prepared by IHS Global Insight using its own data, information and analysis. IHS Inc., IHS Global Insight's parent company, holds an extensive well and production database that provided the basis for assessing national and state-level oil and gas production under different scenarios. IHS Global Insight prepared the economic assessment using its U.S. Macroeconomic and state economic models.

Study Results for Oil and Gas Production

This study determines the effects of regulating hydraulic fracturing on future hydrocarbon production by generating production forecasts for three policy scenarios. The results from these three scenarios are compared with production levels in a reference case, which is based on existing regulations, and with the production levels that would come from existing wells alone ("no drilling"). The results show that the effects of any policy will be substantial in the short-term and will increase in the long-term due to the increasing importance of unconventional plays in natural gas production. These effects will generally be negative, particularly for natural gas, with the potential for higher prices, more imports and negative economic impacts from reduced domestic drilling.



The results of the analysis are summarized below.

- **Elimination of Hydraulic Fracturing (No Frac) Scenario:** In five years, if fracturing were eliminated, there would be a decrease of nearly 79% in wells completed. As a result, the country would experience by 2014, a 17% reduction in oil production and a 45% reduction in natural gas production, relative to the reference case, with declines continuing during the forecast period resulting in a 23% reduction in oil production and a 57% decrease in gas production from the reference case by 2018. Due to the country's increasing reliance on unconventional resources, where over 95% of wells are routinely treated using fracturing, the impact on production would be permanent and severe.
- **Fluid Restrictions Scenario:** By 2014, a change in fluid options for hydraulic fracturing operations would reduce natural gas production by 4.4 tcf or 22%, falling from 20.4 tcf in the reference case to 16 tcf. Similarly, crude oil production would be reduced by 0.1 million barrels per day or 0.1%, falling from 10.1 million barrels per day in the reference case to 10 million barrels per day.

"Measuring the Economic and Energy Impacts of Proposals to Regulate Hydraulic Fracturing" is a study prepared for the American Petroleum Institute that is available at API.org.

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duction would decrease by 0.4 million barrels per day or 8% while wellhead revenue would decrease by 48 billion dollars or 15%.

- **UIC Compliance Scenario.** Implementation of these regulations on oil and gas drilling would result in a 20.5% reduction of new wells drilled over a five year period and a 10% loss of natural gas production within five years. Given the tenuous balance between supply and demand, a loss of 2.1 tcf (6 bcf/day) would result in more imports of pipeline natural gas and LNG.
- **The No Drilling or PDP Scenario.** In addition to comparing the three sets of policy-scenario results with the reference case, an additional point of comparison is provided, on the low side, by the volumes that would be produced only from remaining proved reserves from currently producing wells over their lifetime. This is referred to as the "No Drilling or PDP" scenario.

Study Results for the U.S. Economy

The U.S. macroeconomic results for these three scenarios reflect decreases in production of oil and natural gas, which result in increases in imports to meet the nation's energy demand. The increasingly severe economic consequences follow closely the increasingly stringent restrictions on hydraulic fracturing of the scenarios.

Under the No Fracturing scenario and its oil and natural gas production losses, there is an increasing toll on U.S. economic performance through 2014 that is sustained through 2020. In 2014, real GDP is lower by \$374 billion than in the reference case and employment falls by 2.9 million jobs. While lost production grows over time, the adverse macroeconomic impacts begin during a severe recession, exacerbating recovery and job growth.

In the **UIC Compliance scenario**, the economic impacts also rise through 2014, as real GDP and employment both drop 0.5% below the reference case. In 2014, real GDP is \$84 billion lower than the reference case, and there are 635,000 fewer jobs. In the **Fluid Restrictions Scenario**, real GDP is lower by \$172 billion than in the reference case and employment falls by 1.3 million jobs.

Figure 2.

Estimated Economic Impacts of Restricting Hydraulic Fracturing

	2010	2012	2014	2016	2018	2020
Change in Real GDP from Reference Case (Billion 2008 dollars)						
UIC Compliance	-22	-56	-84	-88	-70	-39
Fluid Restrictions	-44	-115	-172	-186	-157	-92
No Fracturing	-141	-255	-374	-377	-326	-217
Change in Real GDP from Reference Case (Percent Change)						
UIC Compliance	-0.2%	-0.4%	-0.5%	-0.5%	-0.4%	-0.2%
Fluid Restrictions	-0.3%	-0.8%	-1.1%	-1.1%	-0.9%	-0.5%
No Fracturing	-1.0%	-1.7%	-2.3%	-2.2%	-1.8%	-1.1%
Change in Employment from Reference Case (thousand jobs)						
UIC Compliance	-140	-416	-635	-659	-492	-221
Fluid Restrictions	-285	-859	-1298	-1381	-1101	-538
No Fracturing	-922	-1859	-2869	-2890	-2406	-1531
Change in Employment from Reference Case (Percent Change)						
UIC Compliance	-0.1%	-0.3%	-0.4%	-0.5%	-0.3%	-0.1%
Fluid Restrictions	-0.2%	-0.6%	-0.9%	-0.9%	-0.7%	-0.4%
No Fracturing	-0.7%	-1.3%	-2.0%	-2.0%	-1.6%	-1.0%