

CONGRESS OF THE UNITED STATES  
CONGRESSIONAL BUDGET OFFICE

# CBO

## **The Economic and Budgetary Effects of Producing Oil and Natural Gas From Shale**



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*The Cost of Imports.* Shale development confers an economic benefit that raises the standard of living in the United States but does not show up as greater GDP. Specifically, increased net exports of natural gas and oil boost the value of the dollar, making imports cheaper and allowing consumers to buy more and businesses to invest more for a given quantity of exports and a given amount of GDP. CBO has not quantified that effect, however.

*Uncertainty.* CBO's estimates of shale development's effects on GDP are accompanied by significant uncertainty of various kinds. The estimates rest on baseline projections of the prices of shale gas and tight oil, of the quantities of those fuels produced in the United States, and of the profitability of that production—and as is explained earlier (in the section “Uncertainty in the Projections”), all of those projections are uncertain, because of underlying uncertainty about demand for natural gas and oil, demand for other forms of energy, the availability of shale resources, and exploration and production technology.

CBO therefore estimated the effects of shale development not only according to those baseline projections but also under two alternative scenarios. In the first scenario, prices, production, and profitability are all lower than projected in the baseline. Prices of natural gas and oil (reflecting recent EIA projections of price uncertainty) are about 25 percent lower in 2015 than they are in the baseline projection, then grow more slowly than they do

in the baseline, and are about 50 percent lower by 2040. The production of shale gas and tight oil is about 40 percent lower than in the baseline by 2040, a figure that is consistent with what EIA calls its low-resource scenario. And the average cost of producing shale gas rises 75 percent as quickly as the price of natural gas, compared with 50 percent as quickly in CBO's baseline projection.<sup>43</sup>

In the second alternative scenario, the three factors are all *higher* than projected in the baseline. The prices of natural gas and oil start out about 35 percent higher than they are in CBO's baseline projection and grow to be roughly 50 percent higher.<sup>44</sup> The production of shale gas and tight oil is about 40 percent higher than in the baseline by 2040; and profitability is higher because the average cost of producing shale gas rises only 25 percent as fast as the price of natural gas.

In the first scenario, shale development makes real GDP 0.4 percent higher in 2020 and 0.3 percent higher in 2040 than it would have been otherwise. (The effect is smaller in 2040 because the economy then will be larger relative to the market value of shale energy in the scenario.) In the second scenario, GDP is 1.3 percent higher in 2020 and nearly 2 percent higher in 2040 because of shale development.

## Effects on the Federal Budget

The development of shale resources affects two kinds of federal receipts. The first, federal tax revenues, rise as shale development boosts GDP. The second, payments to the government by private developers of federally owned resources, also increase with shale development—but not much, because most of the nation's shale gas and tight oil is not owned by the federal government.

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42. Some researchers have estimated that shale resources will have a much larger impact on the total amount of labor and capital used in the economy in 2020, resulting in a much larger impact on GDP. For example, one report estimates that shale energy could add a net 1.7 million permanent jobs by 2020 and boost GDP by 2 percent to 4 percent; see Susan Lund and others, *Game Changers: Five Opportunities for US Growth and Renewal* (McKinsey & Company, July 2013), <http://tinyurl.com/mazev4d>. Another report estimates that new energy supply may create 2.7 million to 3.6 million jobs by 2020, on net, and boost GDP by 2 percent to 3 percent; see Edward L. Morse and others, *Energy 2020: North America, the New Middle East?* (Citigroup, March 2012), <http://tinyurl.com/mo7k7dt>. Those researchers' estimates of net jobs created are much higher than CBO's. The difference probably arises because the other researchers think that labor supply responds more strongly to increases in wages; that in 2020, the economy will still not be producing its maximum sustainable level of output (so underused labor could still be drawn into shale development without reducing the labor available to other industries); or both. For a detailed discussion of CBO's estimating approach, see Appendix B.

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43. That average cost will rise because more costly resources will be profitable to develop as natural gas prices rise. The projection that it will rise more slowly than natural gas prices is consistent with EIA projections that shale gas will continue to grow as a share of overall U.S. gas production.

44. The larger initial departure from baseline prices—35 percent, compared with 25 percent in the first scenario—is consistent with EIA's recent price forecasts, which in turn reflect market expectations (shown in futures prices and trading prices for options contracts) that near-term prices have more potential to be higher than expected than to be lower than expected. See Energy Information Administration, *Short-Term Energy Outlook* (November 2014), [www.eia.gov/forecasts/steo/outlook.cfm](http://www.eia.gov/forecasts/steo/outlook.cfm).