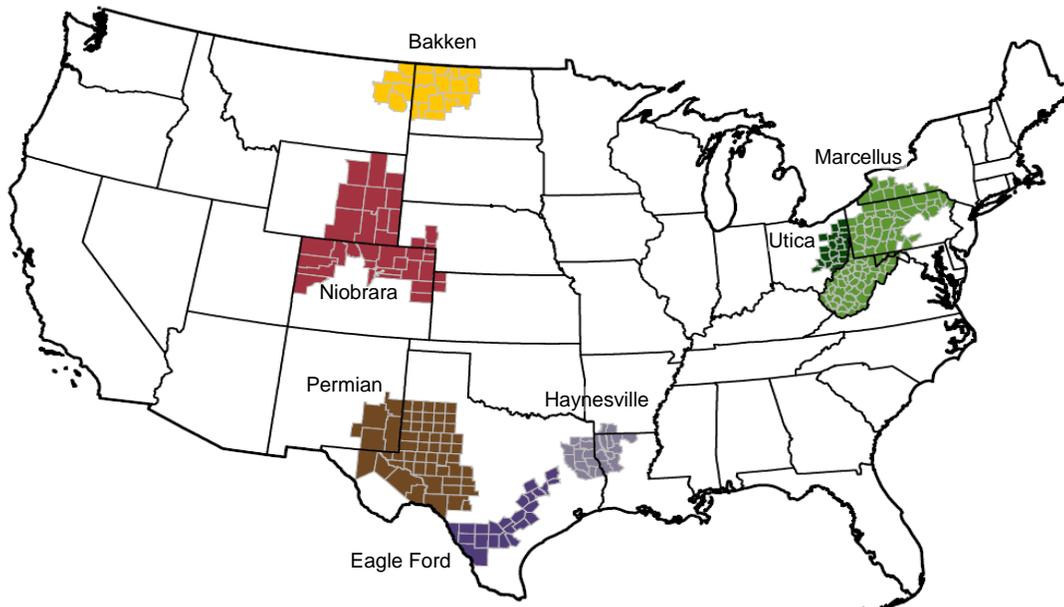




## Drilling Productivity Report

For key tight oil and shale gas regions

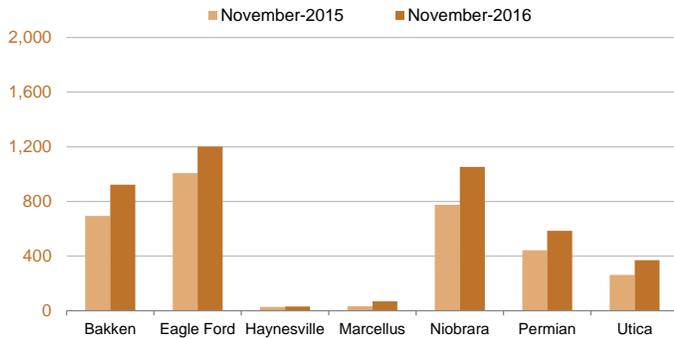


The seven regions analyzed in this report accounted for 92% of domestic oil production growth and all domestic natural gas production growth during 2011-14.

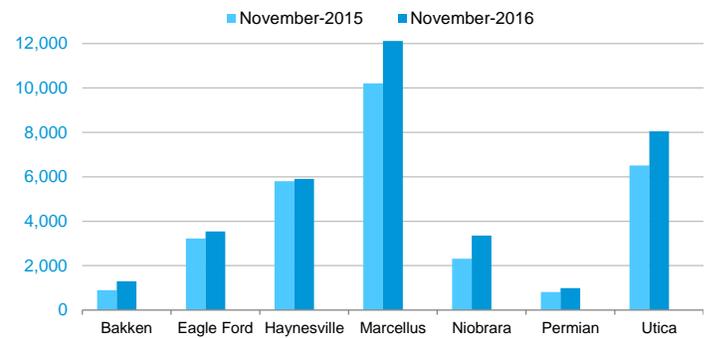
### Contents

Year-over-year summary	2
Bakken Region	3
Eagle Ford Region	4
Haynesville Region	5
Marcellus Region	6
Niobrara Region	7
Permian Region	8
Utica Region	9
Explanatory notes	10
Sources	11

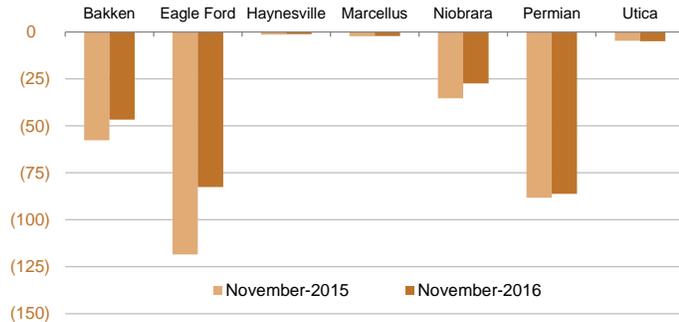
**New-well oil production per rig**  
barrels/day



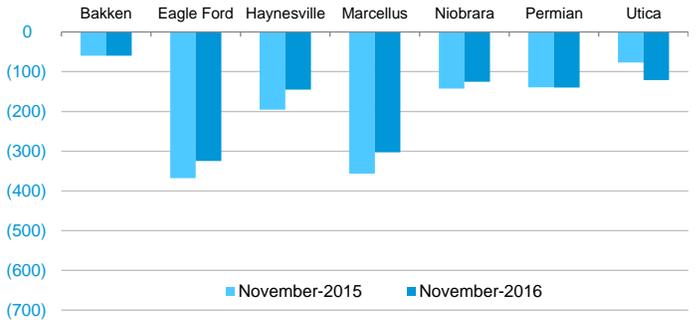
**New-well gas production per rig**  
thousand cubic feet/day



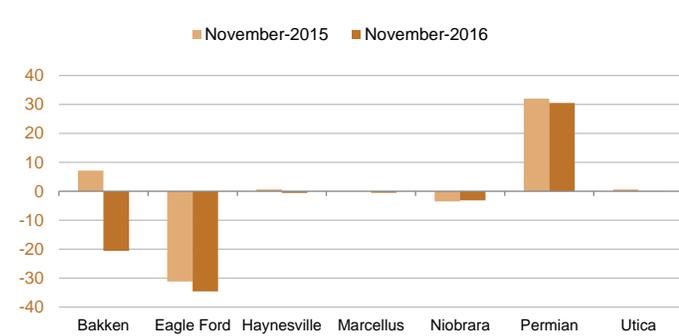
**Legacy oil production change**  
thousand barrels/day



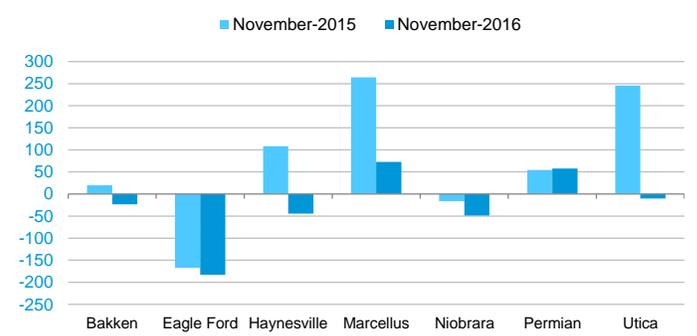
**Legacy gas production change**  
million cubic feet/day



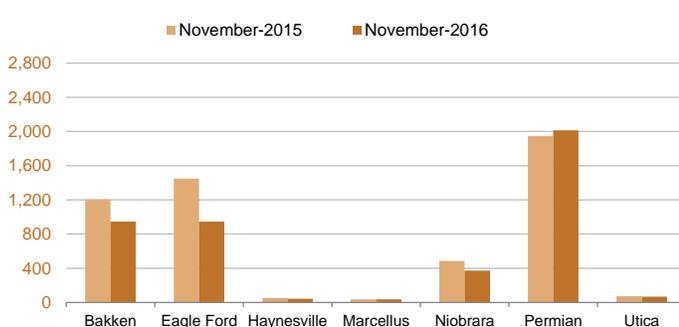
**Indicated monthly change in oil production (Nov vs. Oct)**  
thousand barrels/day



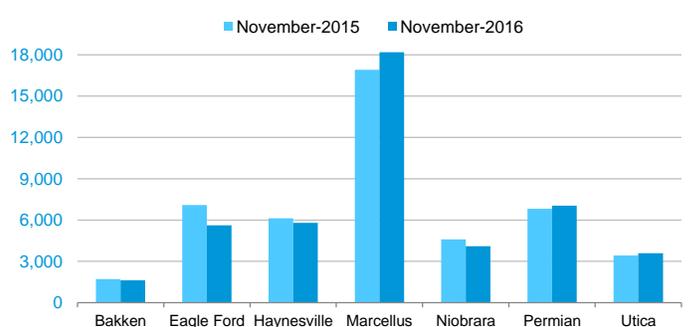
**Indicated monthly change in gas production (Nov vs. Oct)**  
million cubic feet/day



**Oil production**  
thousand barrels/day



**Natural gas production**  
million cubic feet/day



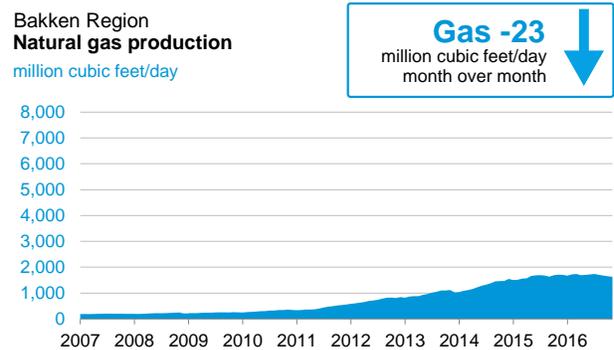
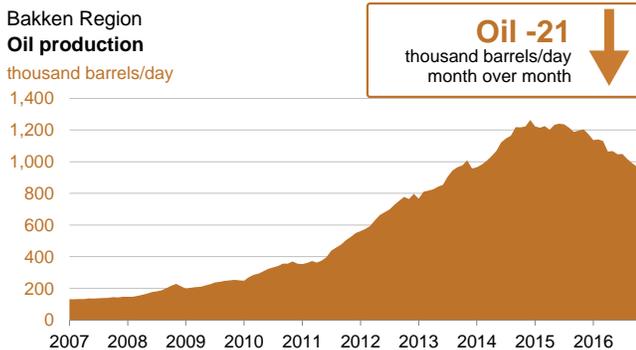
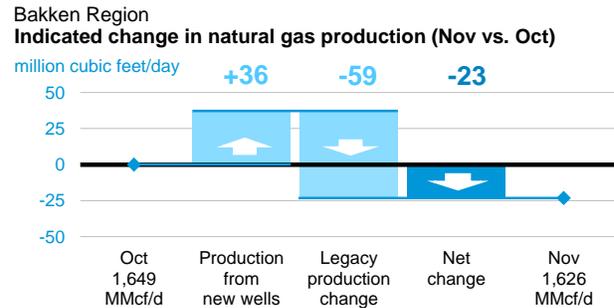
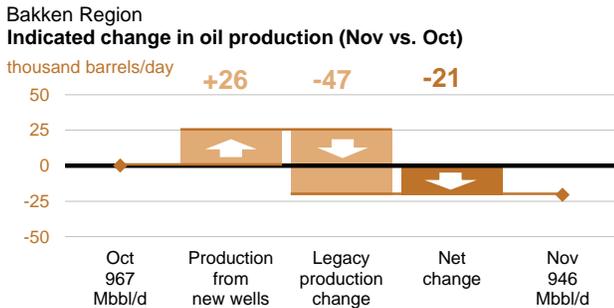
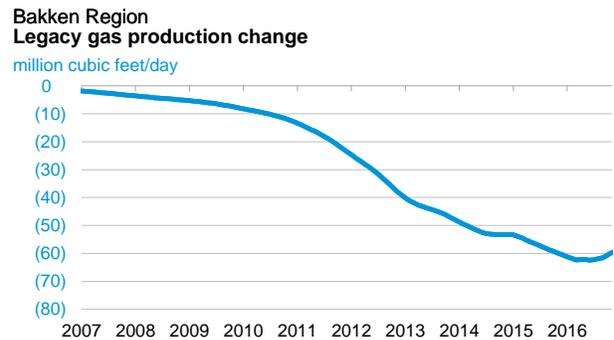
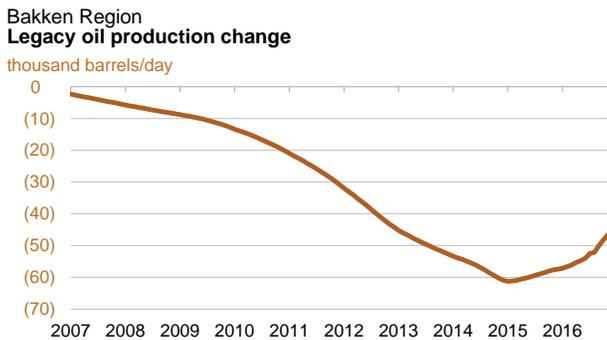
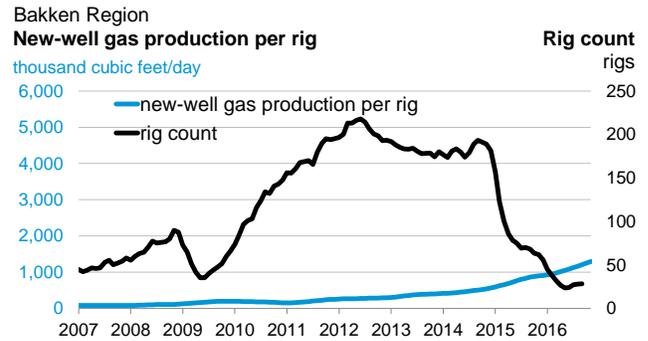
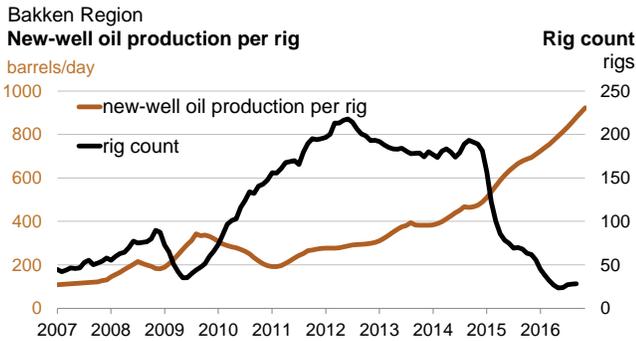
# eia Bakken Region

## Drilling Productivity Report

October 2016  
drilling data through September  
projected production through November



**Monthly additions from one average rig**



**Oil**  
**+16**  
barrels/day  
month over month

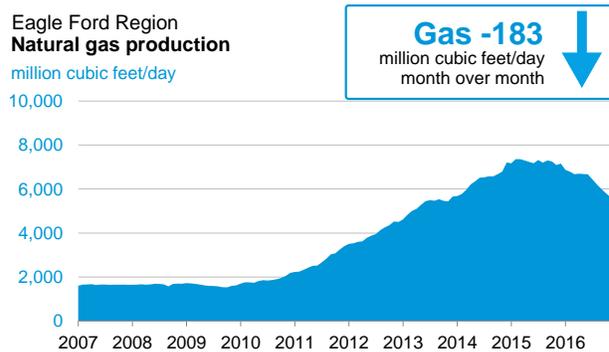
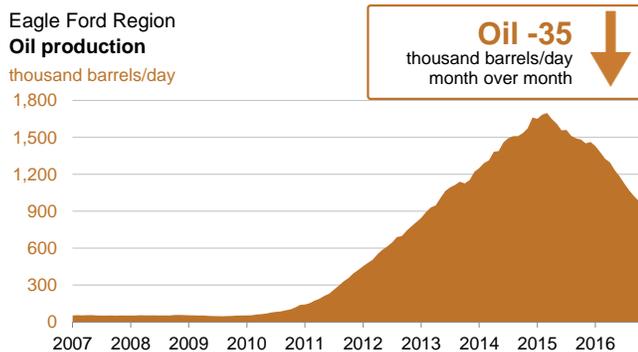
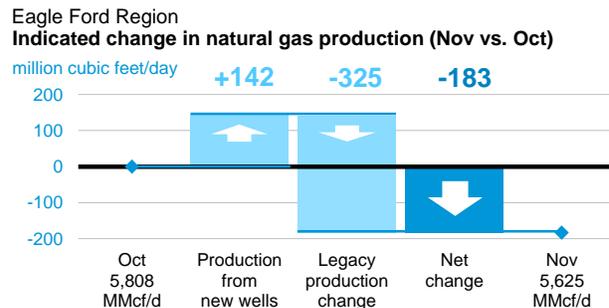
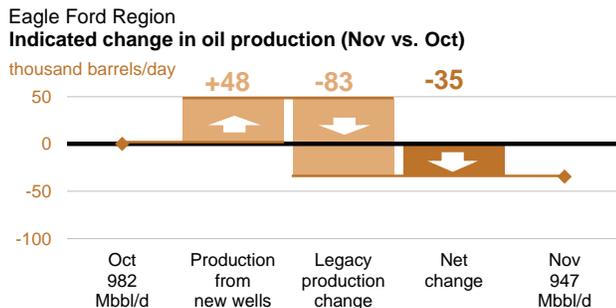
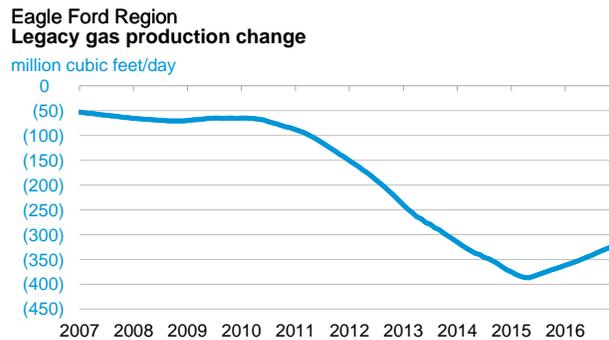
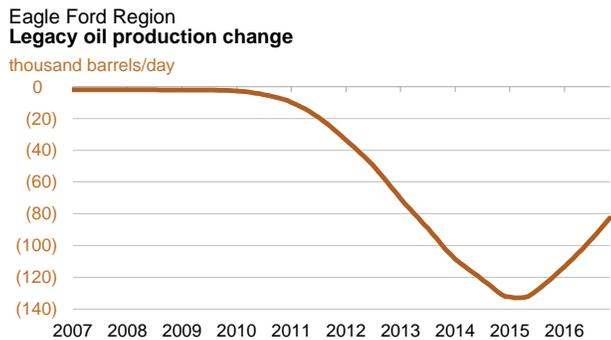
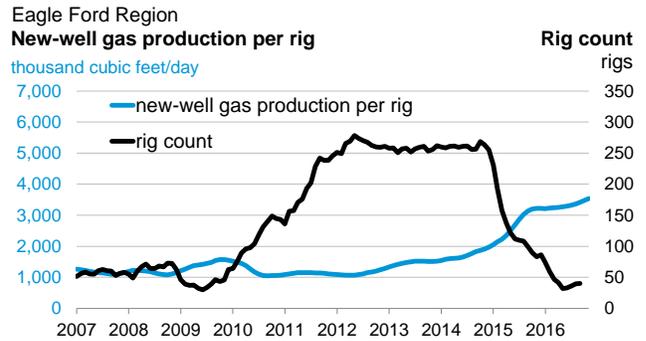
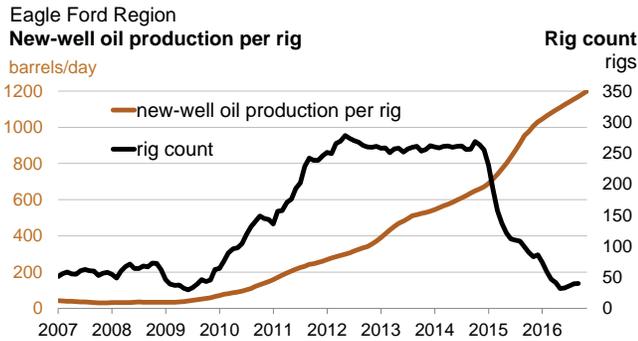


**1,201** November  
**1,185** October  
barrels/day

**Monthly additions from one average rig**

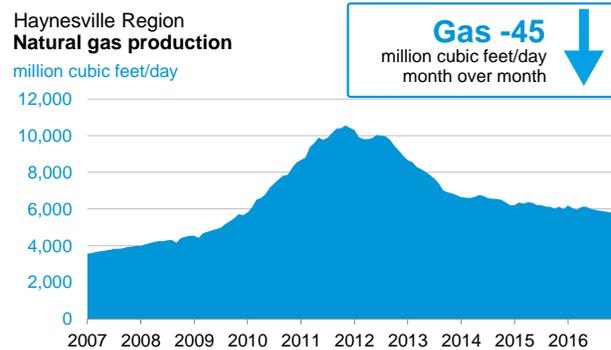
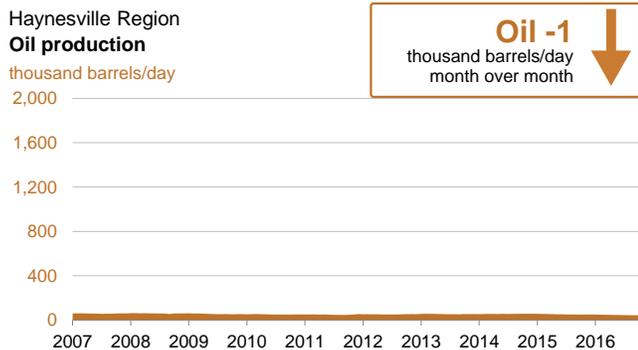
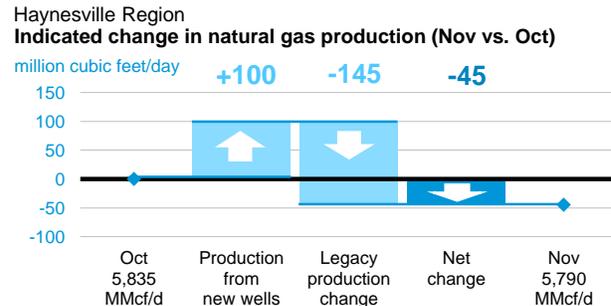
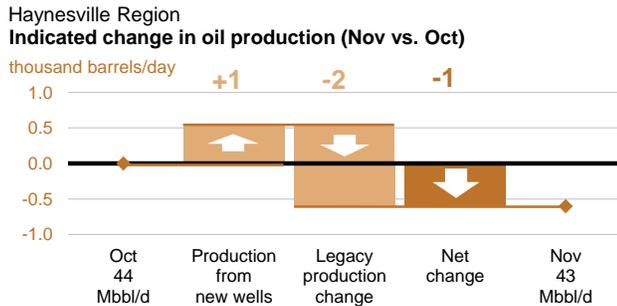
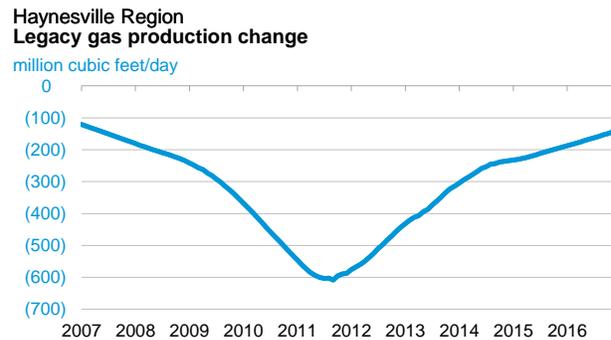
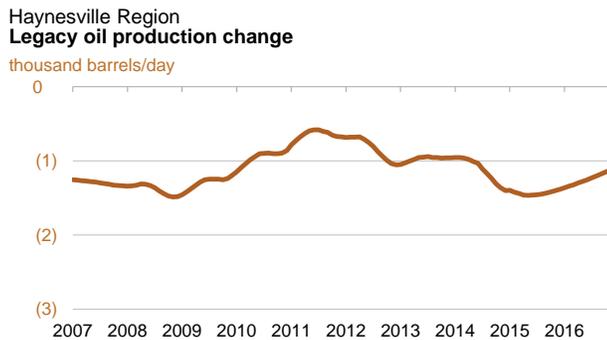
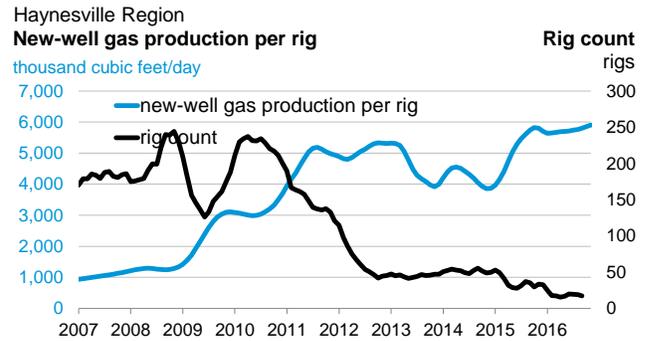
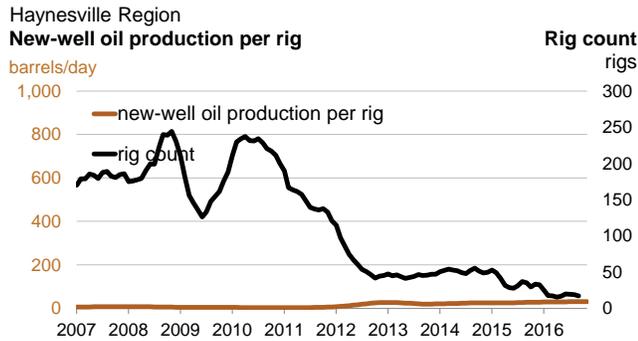
November **3,542**  
October **3,476**  
thousand cubic feet/day

**Gas**  
**+66**  
thousand cubic feet/day  
month over month

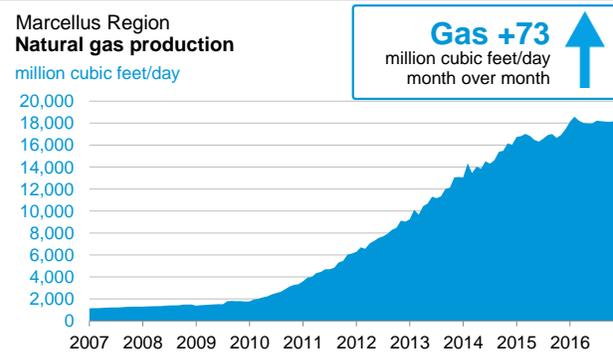
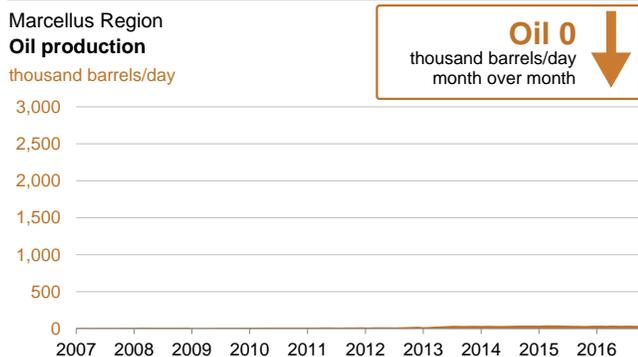
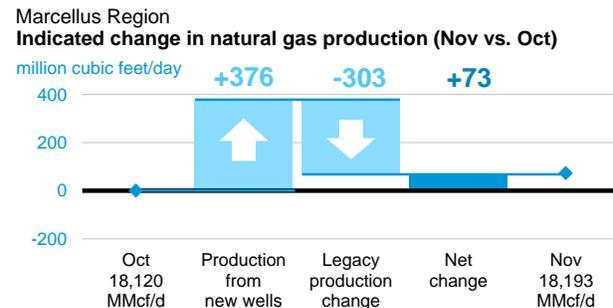
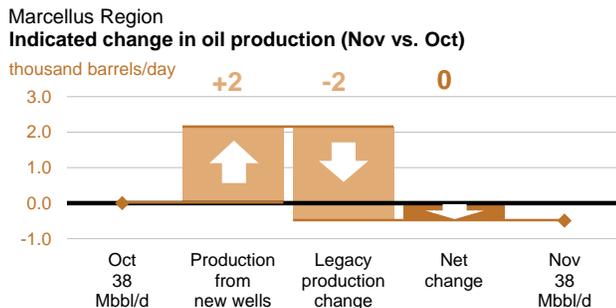
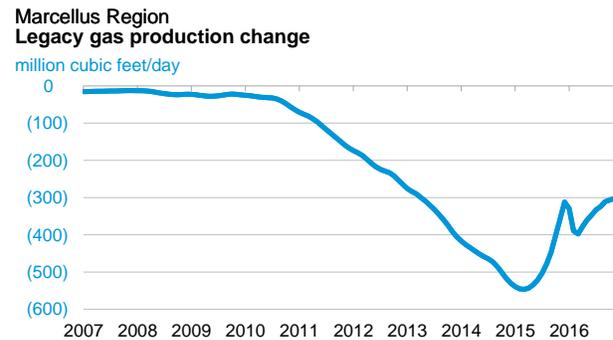
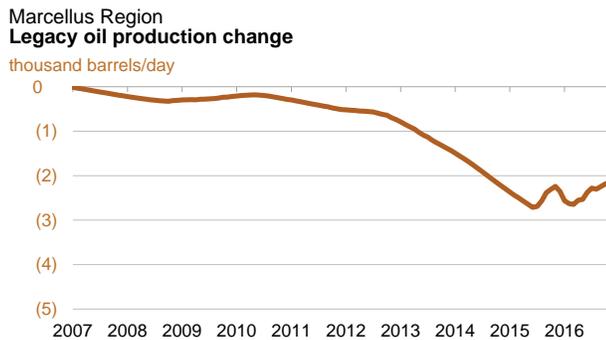
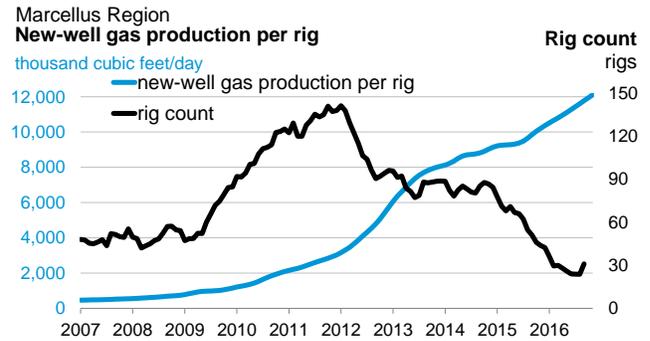
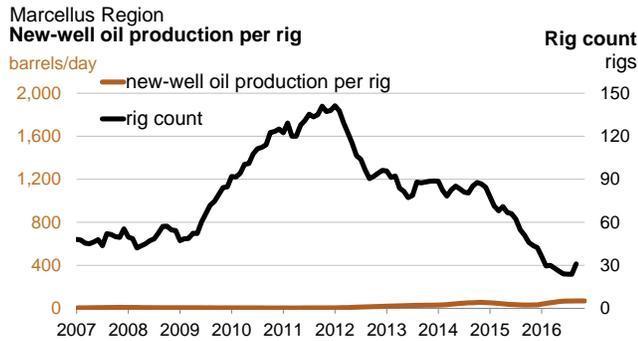


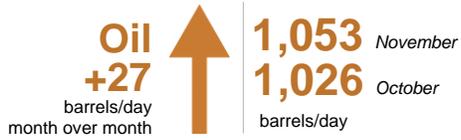
**Monthly additions from one average rig**



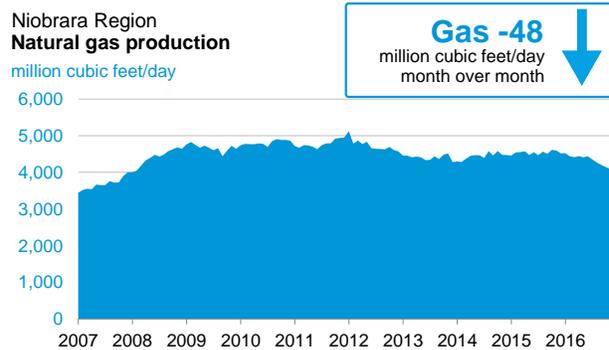
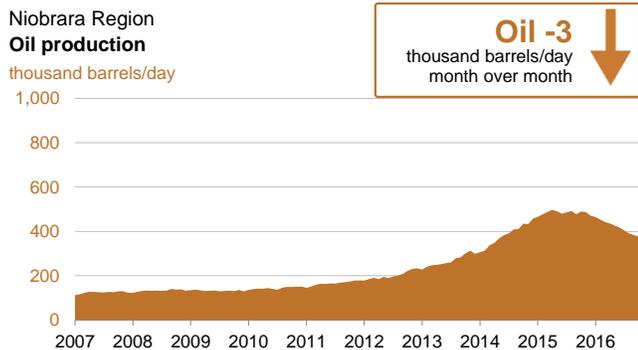
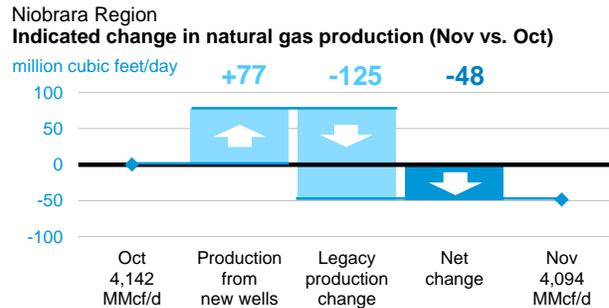
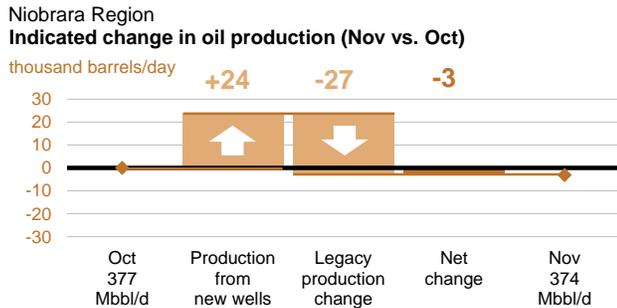
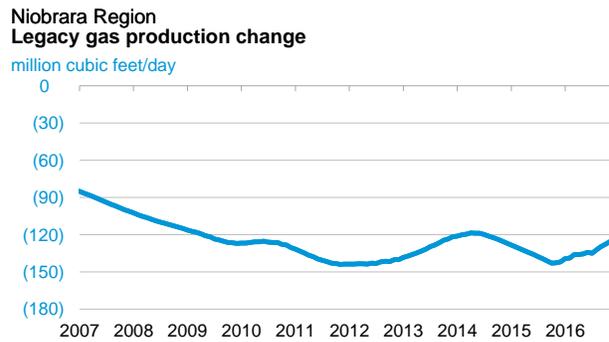
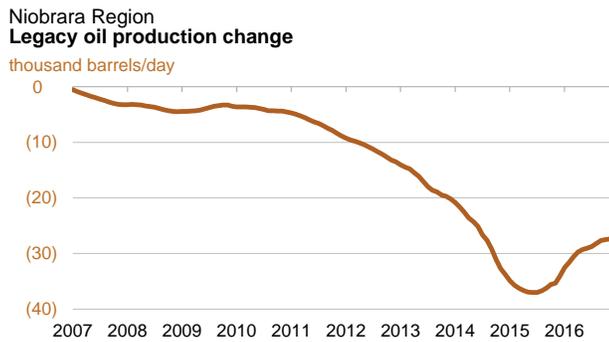
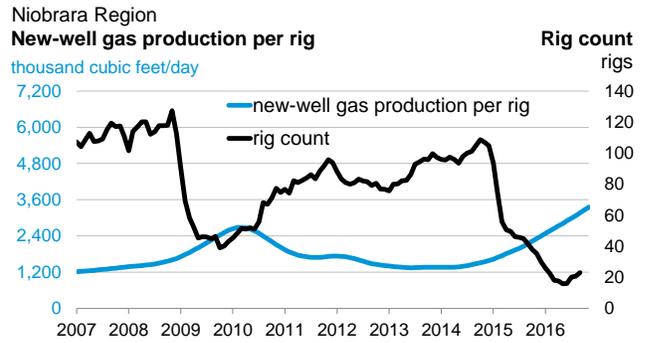
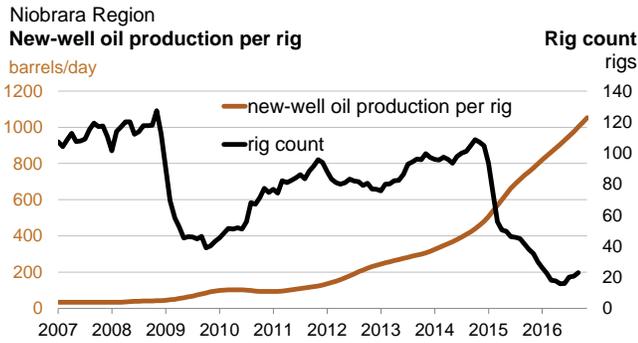
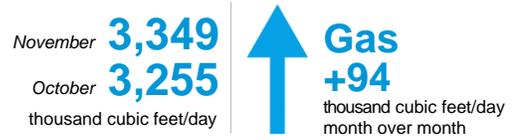


Monthly additions from one average rig



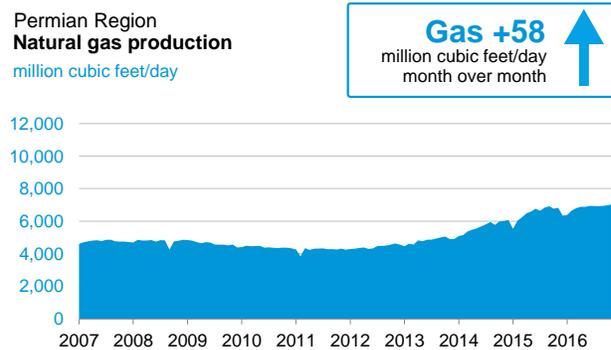
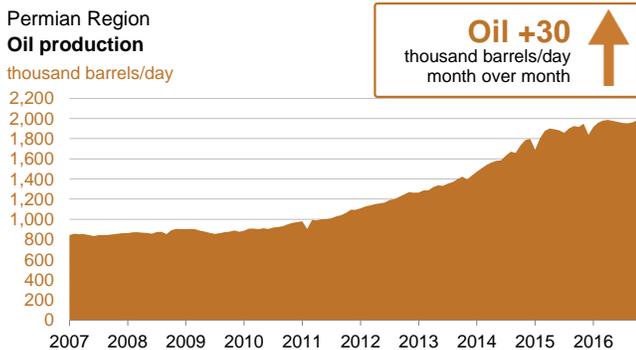
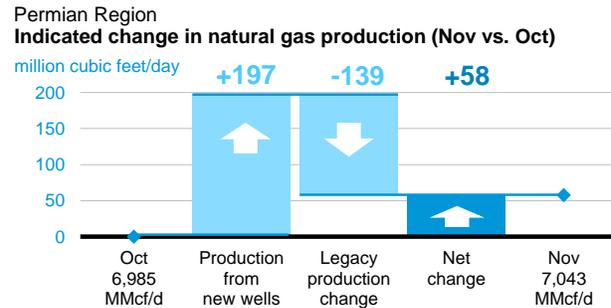
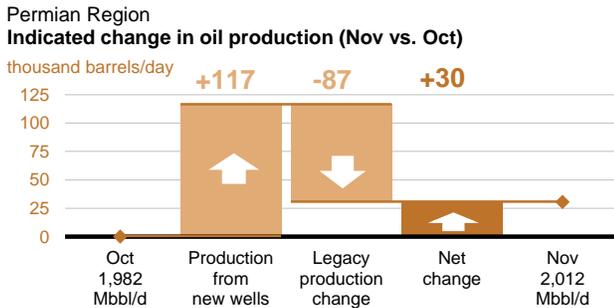
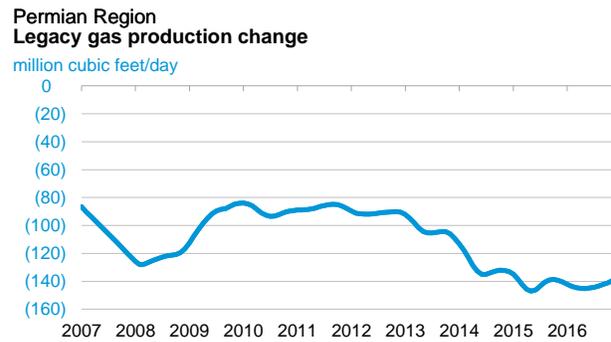
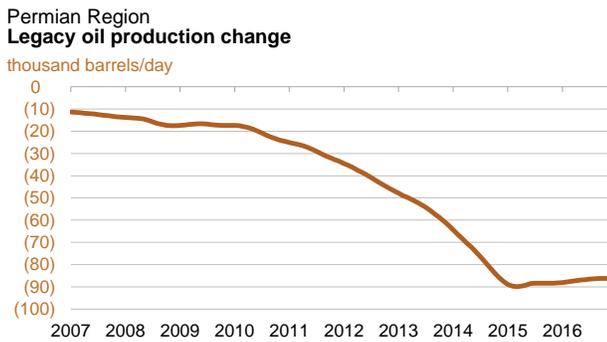
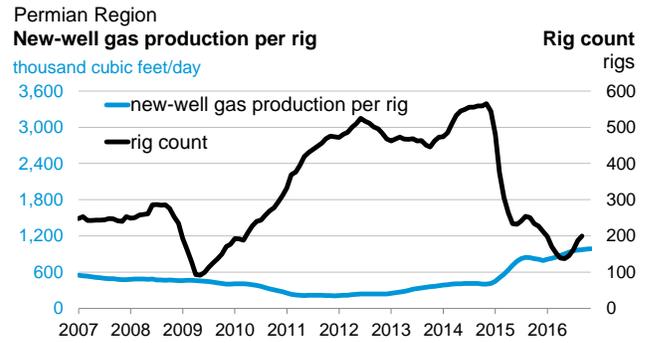
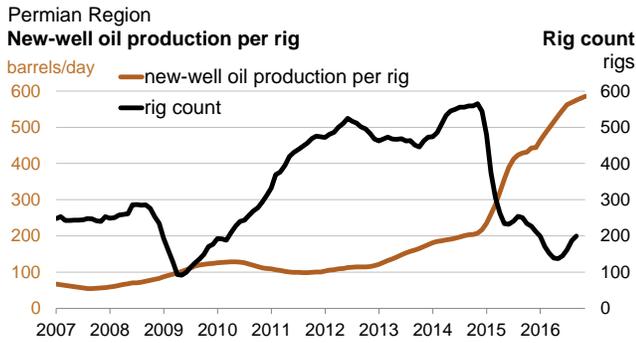
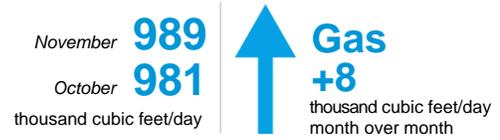


Monthly additions from one average rig



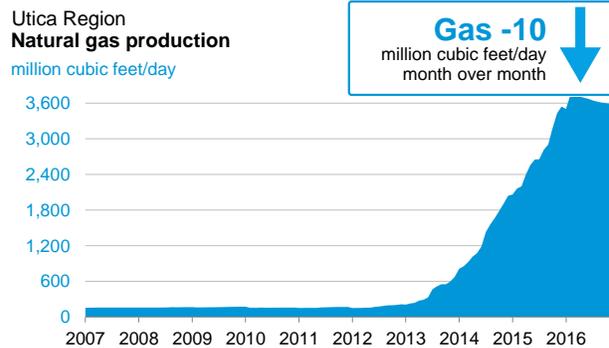
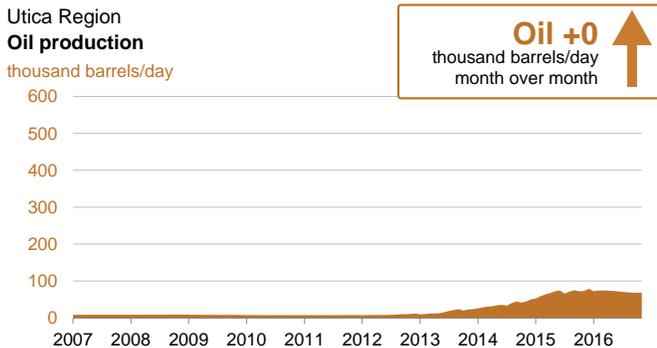
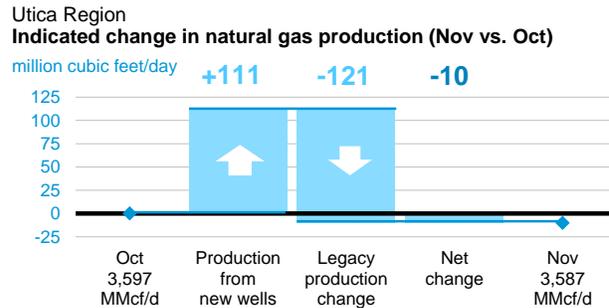
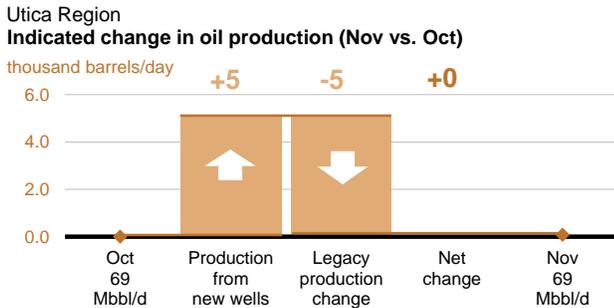
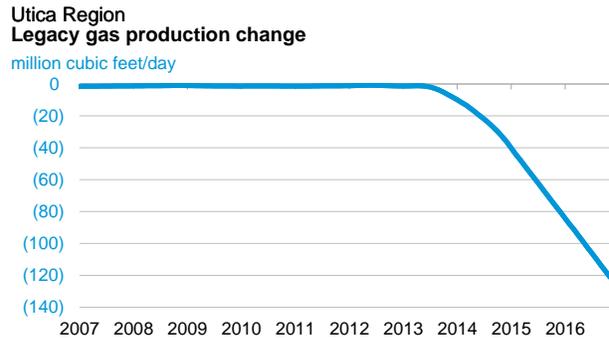
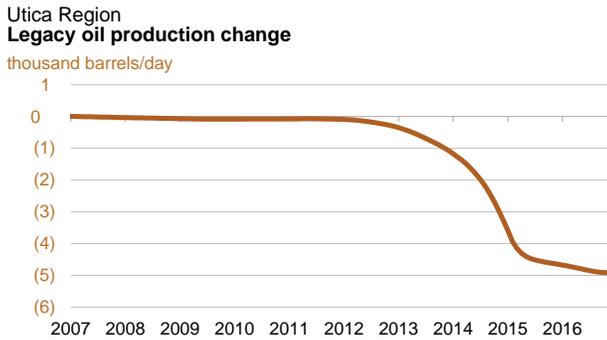
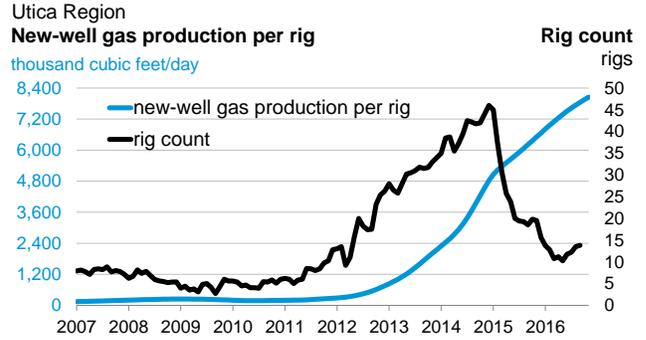
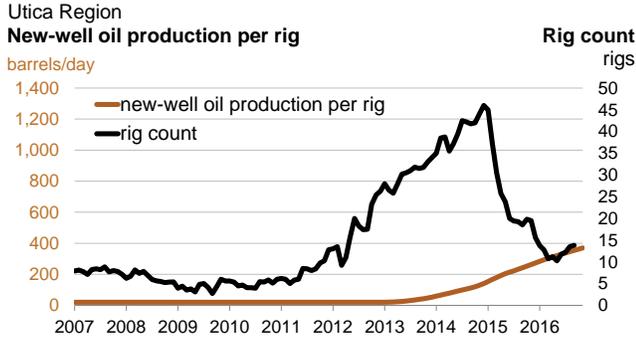


Monthly additions from one average rig





**Monthly additions from one average rig**





The Drilling Productivity Report uses recent data on the total number of drilling rigs in operation along with estimates of drilling productivity and estimated changes in production from existing oil and natural gas wells to provide estimated changes in oil<sup>1</sup> and natural gas<sup>2</sup> production for seven key regions. EIA's approach does not distinguish between oil-directed rigs and gas-directed rigs because once a well is completed it may produce both oil and gas; more than half of the wells do that.

### **Monthly additions from one average rig**

Monthly additions from one average rig represent EIA's estimate of an average rig's<sup>3</sup> contribution to production of oil and natural gas from new wells.<sup>4</sup> The estimation of new-well production per rig uses several months of recent historical data on total production from new wells for each field divided by the region's monthly rig count, lagged by two months.<sup>5</sup> Current- and next-month values are listed on the top header. The month-over-month change is listed alongside, with +/- signs and color-coded arrows to highlight the growth or decline in oil (brown) or natural gas (blue).

### **New-well oil/gas production per rig**

Charts present historical estimated monthly additions from one average rig coupled with the number of total drilling rigs as reported by Baker Hughes.

### **Legacy oil and natural gas production change**

Charts present EIA's estimates of total oil and gas production changes from all the wells other than the new wells. The trend is dominated by the well depletion rates, but other circumstances can influence the direction of the change. For example, well freeze-offs or hurricanes can cause production to significantly decline in any given month, resulting in a production increase the next month when production simply returns to normal levels.

### **Projected change in monthly oil/gas production**

Charts present the combined effects of new-well production and changes to legacy production. Total new-well production is offset by the anticipated change in legacy production to derive the net change in production. The estimated change in production does not reflect external circumstances that can affect the actual rates, such as infrastructure constraints, bad weather, or shut-ins based on environmental or economic issues.

### **Oil/gas production**

Charts present all oil and natural gas production from both new and legacy wells since 2007. This production is based on all wells reported to the state oil and gas agencies. Where state data are not immediately available, EIA estimates the production based on estimated changes in new-well oil/gas production and the corresponding legacy change.

### **Footnotes:**

1. Oil production represents both crude and condensate production from all formations in the region. Production is not limited to tight formations. The regions are defined by all selected counties, which include areas outside of tight oil formations.
2. Gas production represents gross (before processing) gas production from all formations in the region. Production is not limited to shale formations. The regions are defined by all selected counties, which include areas outside of shale formations.
3. The monthly average rig count used in this report is calculated from weekly data on total oil and gas rigs reported by Baker Hughes.
4. A new well is defined as one that began producing for the first time in the previous month. Each well belongs to the new-well category for only one month. Reworked and recompleted wells are excluded from the calculation.
5. Rig count data lag production data because EIA has observed that the best predictor of the number of new wells beginning production in a given month is the count of rigs in operation two months earlier.



The data used in the preparation of this report come from the following sources. EIA is solely responsible for the analysis, calculations, and conclusions.

**Drilling Info** (<http://www.drillinginfo.com>) Source of production, permit, and spud data for counties associated with this report. Source of real-time rig location to estimate new wells spudded and completed throughout the United States.

**Baker Hughes** (<http://www.bakerhughes.com>) Source of rig and well counts by county, state, and basin.

**North Dakota Oil and Gas Division** (<https://www.dmr.nd.gov/oilgas>) Source of well production, permit, and completion data in the counties associated with this report in North Dakota

**Railroad Commission of Texas** (<http://www.rrc.state.tx.us>) Source of well production, permit, and completion data in the counties associated with this report in Texas

**Pennsylvania Department of Environmental Protection** (<https://www.paoilandgasreporting.state.pa.us/publicreports/Modules/Welcome/Welcome.aspx>) Source of well production, permit, and completion data in the counties associated with this report in Pennsylvania

**West Virginia Department of Environmental Protection** (<http://www.dep.wv.gov/oil-and-gas/Pages/default.aspx>) Source of well production, permit, and completion data in the counties associated with this report in West Virginia

**Colorado Oil and Gas Conservation Commission** (<http://cogcc.state.co.us>) Source of well production, permit, and completion data in the counties associated with this report in Colorado

**Wyoming Oil and Conservation Commission** (<http://wogcc.state.wy.us>) Source of well production, permit, and completion data in the counties associated with this report in Wyoming

**Louisiana Department of Natural Resources** (<http://dnr.louisiana.gov>) Source of well production, permit, and completion data in the counties associated with this report in Louisiana

**Ohio Department of Natural Resources** (<http://oilandgas.ohiodnr.gov>) Source of well production, permit, and completion data in the counties associated with this report in Ohio