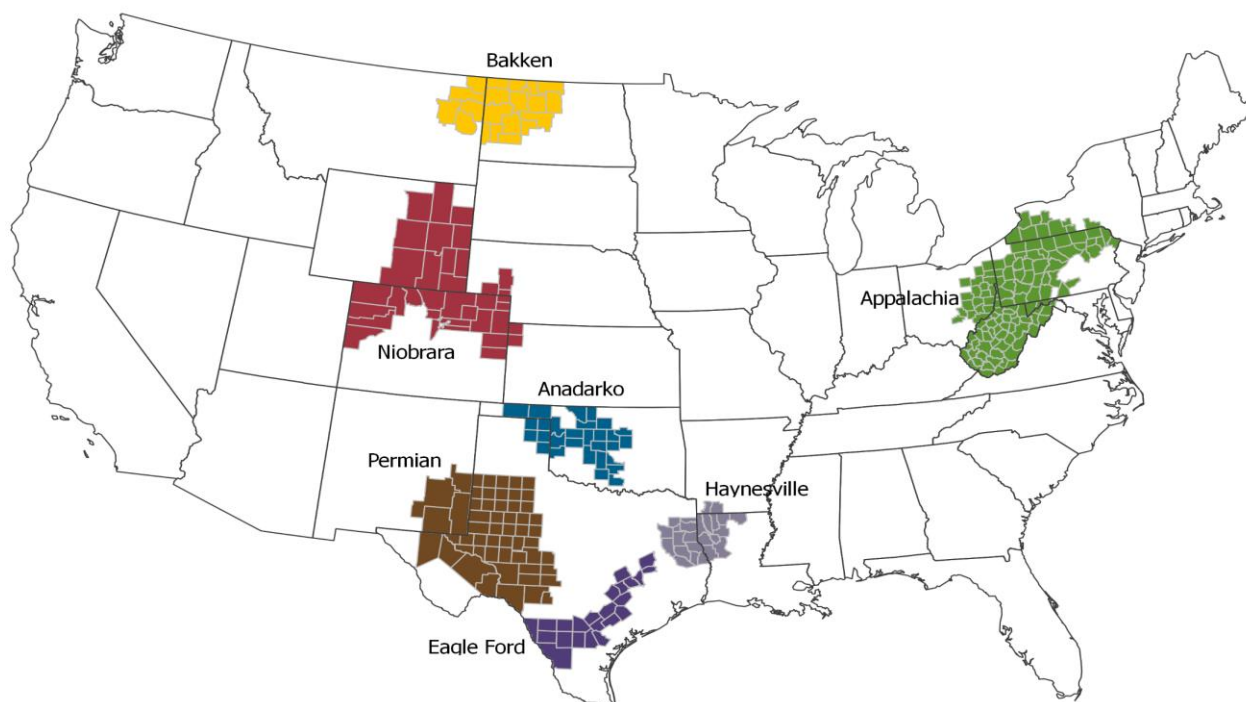




Drilling Productivity Report

For key tight oil and shale gas regions



Contents

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



Year-over-year summary

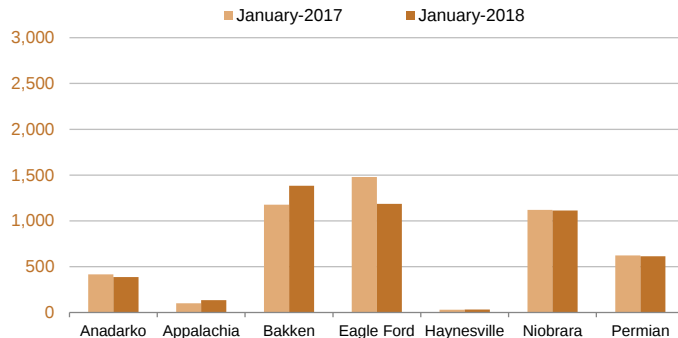
Drilling Productivity Report

December 2017

drilling data through November
projected production through January

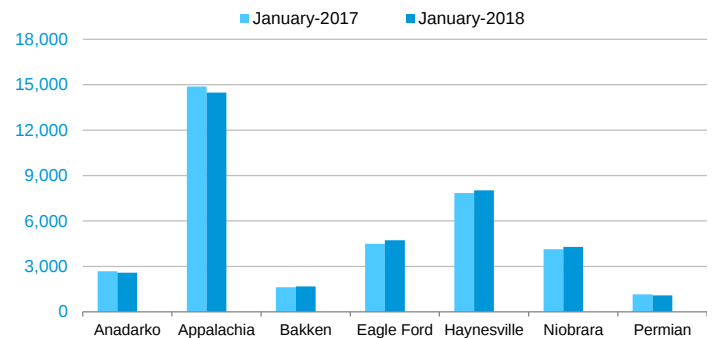
New-well oil production per rig

barrels/day



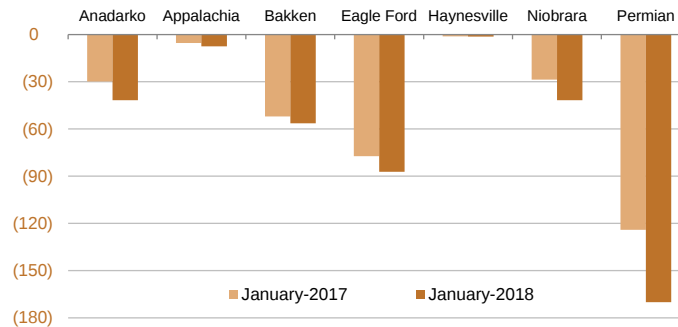
New-well gas production per rig

thousand cubic feet/day



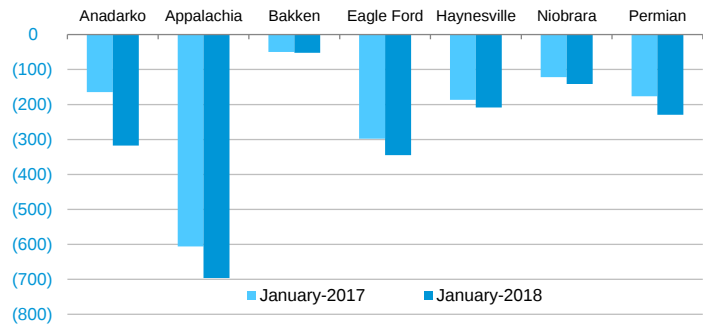
Legacy oil production change

thousand barrels/day



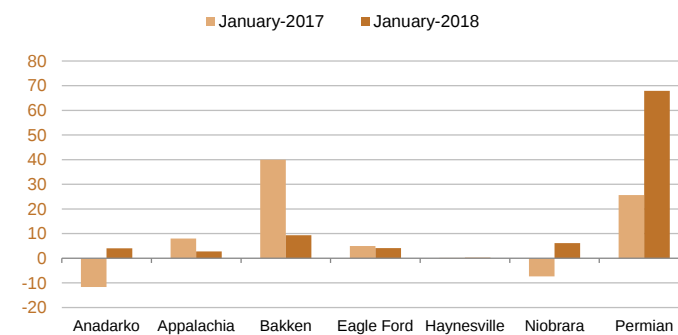
Legacy gas production change

million cubic feet/day



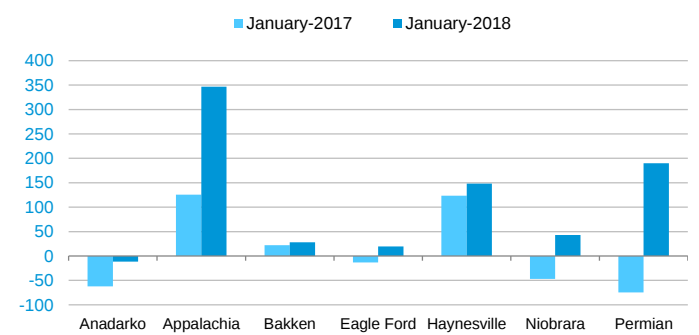
Indicated monthly change in oil production (Jan vs. Dec)

thousand barrels/day



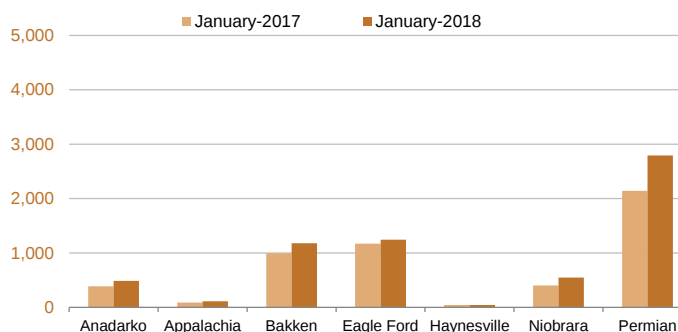
Indicated monthly change in gas production (Jan vs. Dec)

million cubic feet/day



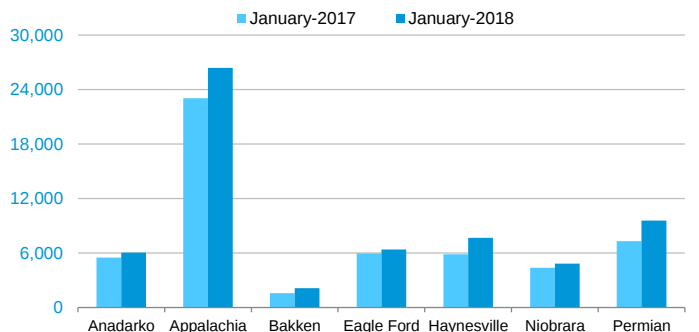
Oil production

thousand barrels/day



Natural gas production

million cubic feet/day





Anadarko Region

Drilling Productivity Report

December 2017

drilling data through November
projected production through January

Oil +5
barrels/day
month over month

387 January
382 December
barrels/day

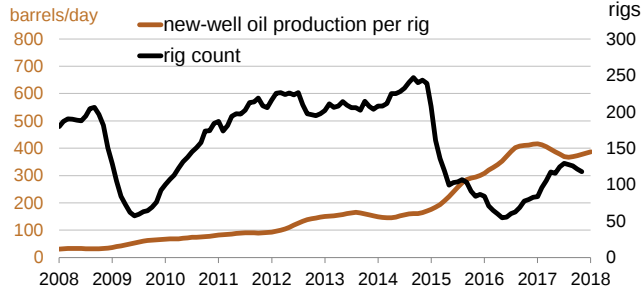
Monthly
additions
from one
average rig

January **2,590**
December **2,573**
thousand cubic feet/day

Gas +17
thousand cubic feet/day
month over month

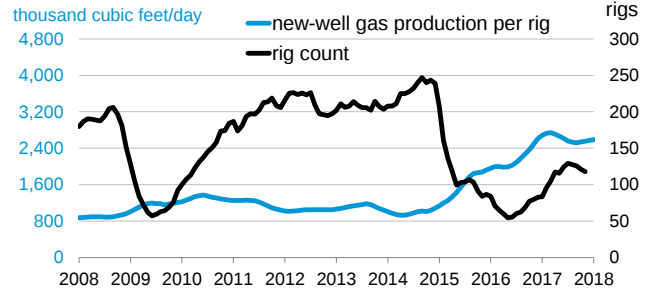
Anadarko Region

New-well oil production per rig



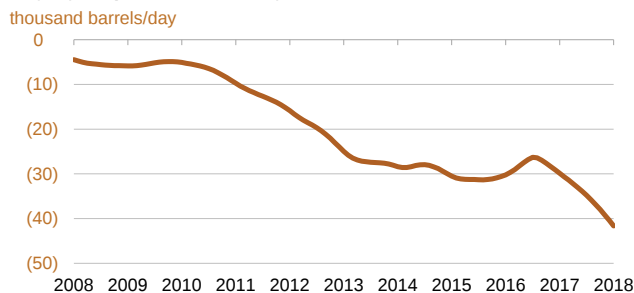
Anadarko Region

New-well gas production per rig



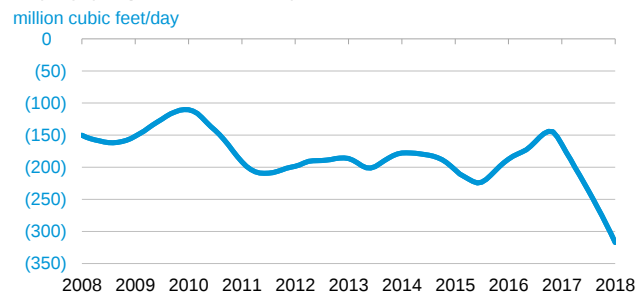
Anadarko Region

Legacy oil production change



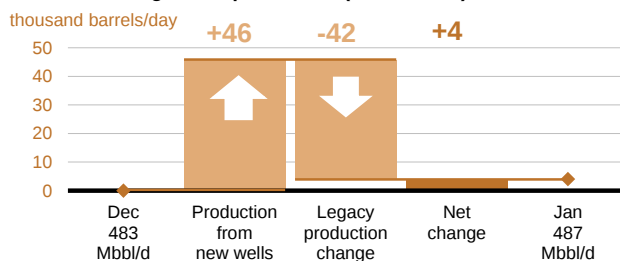
Anadarko Region

Legacy gas production change



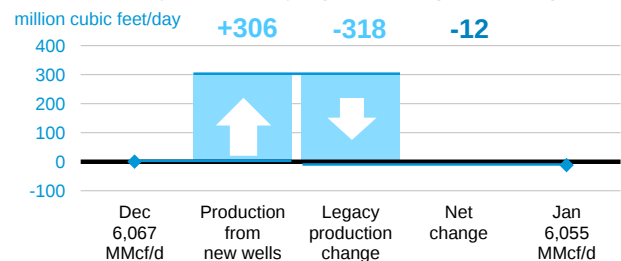
Anadarko Region

Indicated change in oil production (Jan vs. Dec)



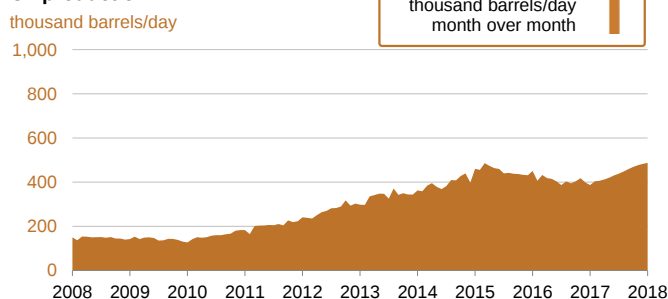
Anadarko Region

Indicated change in natural gas production (Jan vs. Dec)



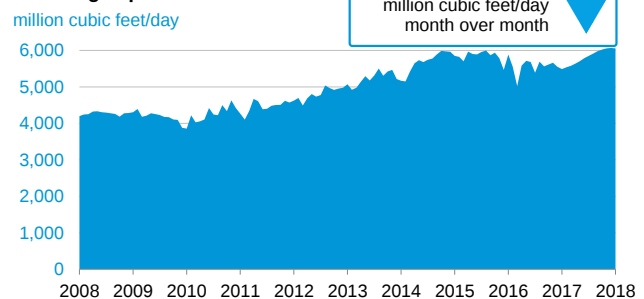
Anadarko Region

Oil production



Anadarko Region

Natural gas production



Oil +1
barrels/day
month over month

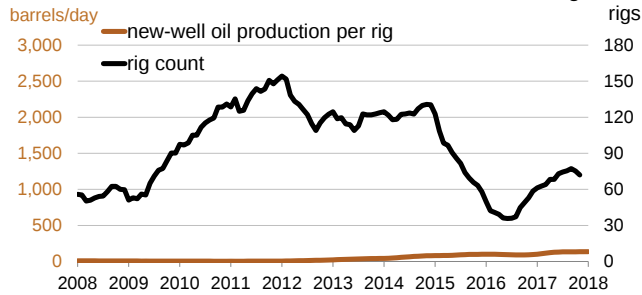
136 January
135 December
barrels/day

Monthly additions from one average rig

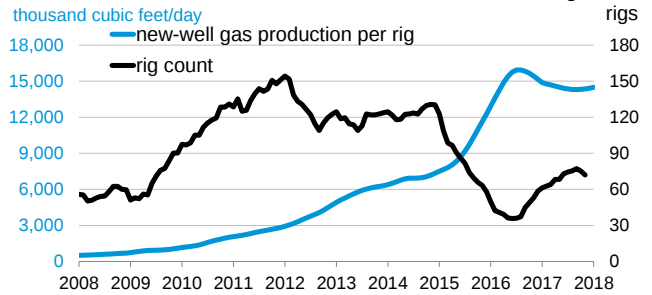
January **14,488**
December **14,411**
thousand cubic feet/day

Gas +77
thousand cubic feet/day
month over month

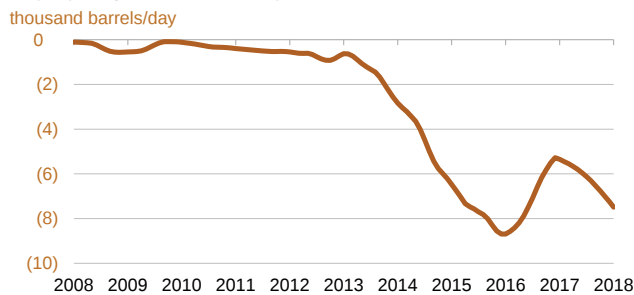
Appalachia Region New-well oil production per rig



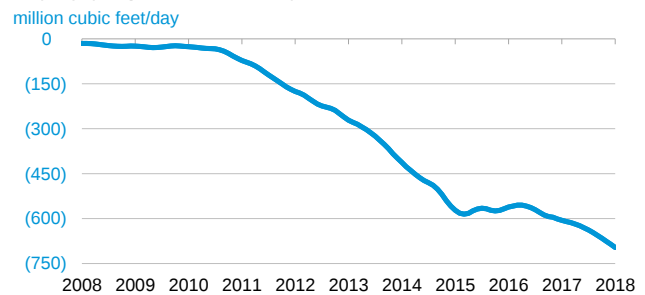
Appalachia Region New-well gas production per rig



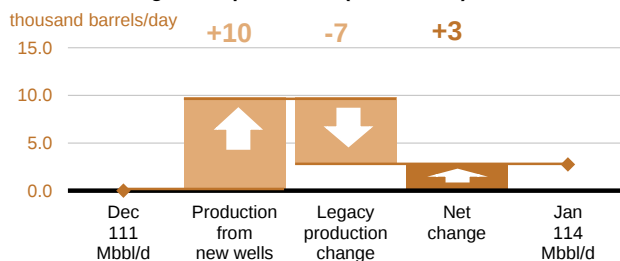
Appalachia Region Legacy oil production change



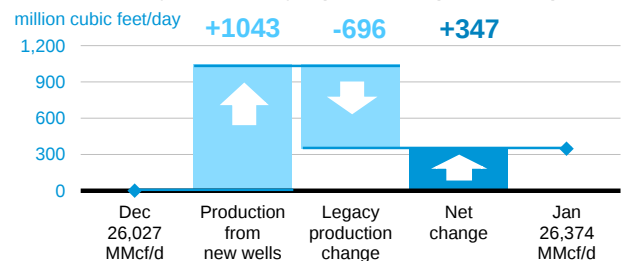
Appalachia Region Legacy gas production change



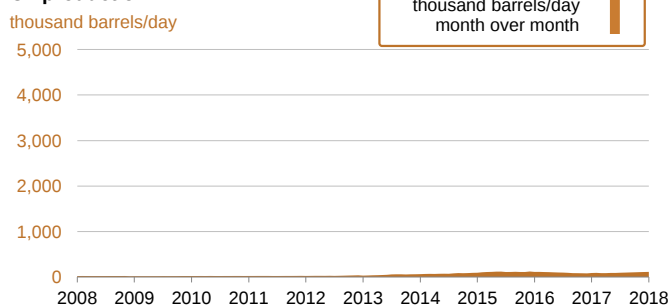
Appalachia Region Indicated change in oil production (Jan vs. Dec)



Appalachia Region Indicated change in natural gas production (Jan vs. Dec)

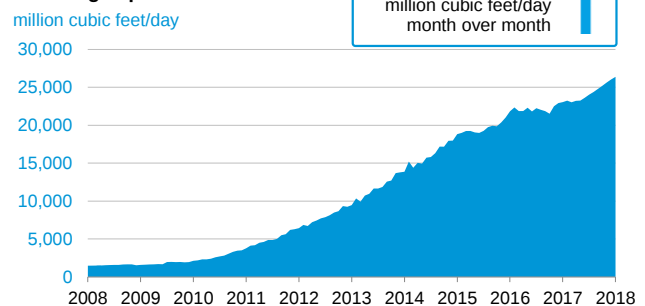


Appalachia Region Oil production



Oil +3
thousand barrels/day
month over month

Appalachia Region Natural gas production



Gas +347
million cubic feet/day
month over month

eia Bakken Region

Drilling Productivity Report

December 2017
drilling data through November
projected production through January

Oil +17
barrels/day
month over month

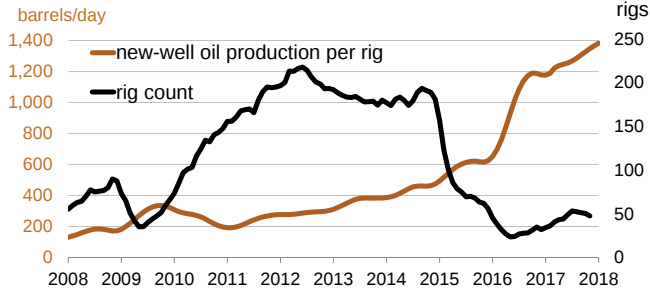
1,383 January
1,366 December
barrels/day

Monthly additions from one average rig

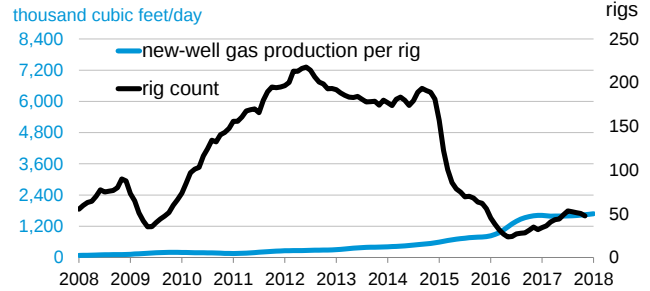
January **1,681**
December **1,661**
thousand cubic feet/day

Gas +20
thousand cubic feet/day
month over month

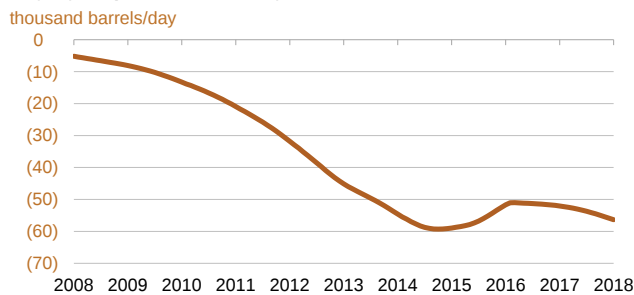
Bakken Region
New-well oil production per rig



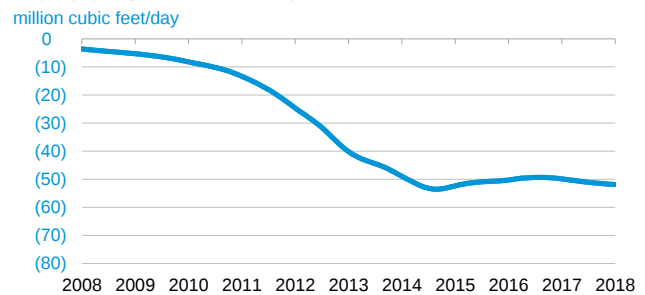
Bakken Region
New-well gas production per rig



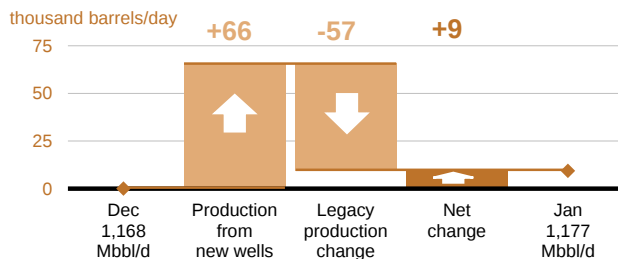
Bakken Region
Legacy oil production change



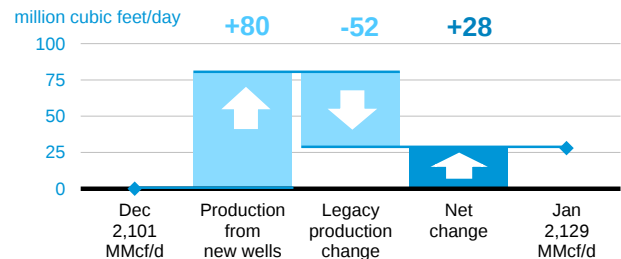
Bakken Region
Legacy gas production change



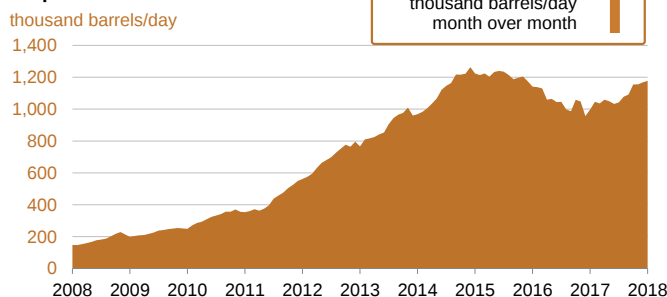
Bakken Region
Indicated change in oil production (Jan vs. Dec)



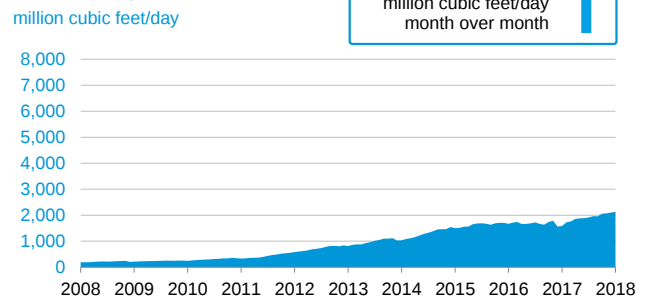
Bakken Region
Indicated change in natural gas production (Jan vs. Dec)



Bakken Region
Oil production



Bakken Region
Natural gas production



Oil
+49
barrels/day
month over month

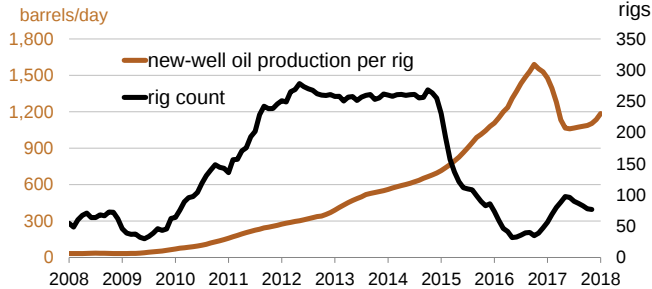
1,185 January
1,136 December
barrels/day

**Monthly
additions
from one
average rig**

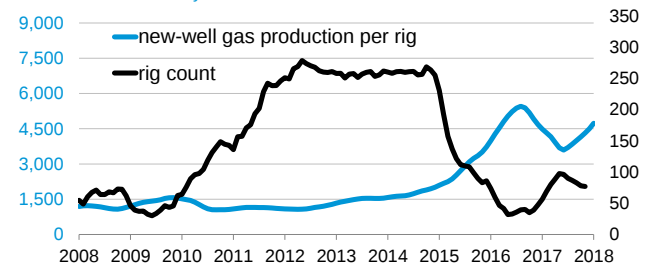
January **4,732**
December **4,506**
thousand cubic feet/day

Gas
+226
thousand cubic feet/day
month over month

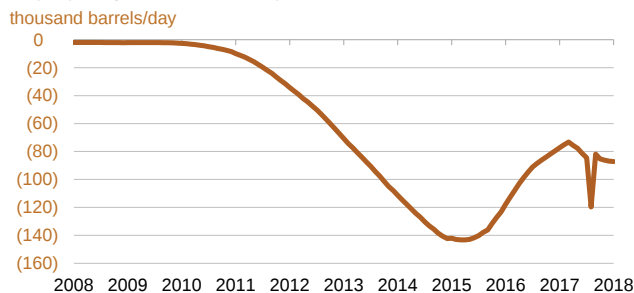
Eagle Ford Region
New-well oil production per rig



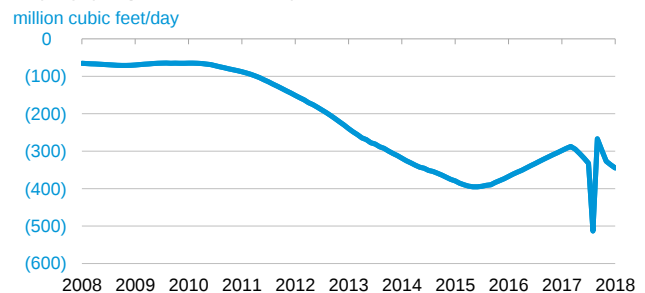
Eagle Ford Region
New-well gas production per rig



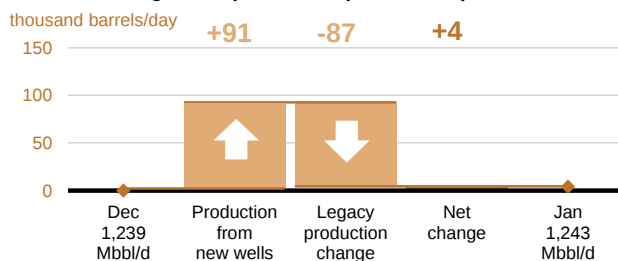
Eagle Ford Region
Legacy oil production change



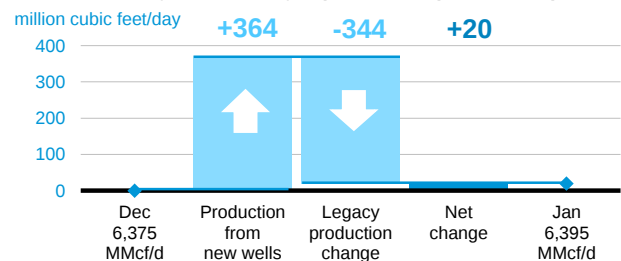
Eagle Ford Region
Legacy gas production change



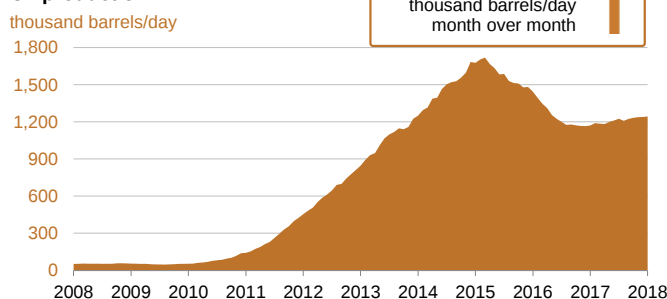
Eagle Ford Region
Indicated change in oil production (Jan vs. Dec)



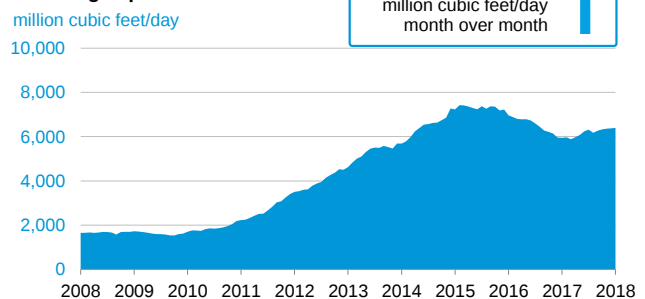
Eagle Ford Region
Indicated change in natural gas production (Jan vs. Dec)



Eagle Ford Region
Oil production



Eagle Ford Region
Natural gas production





Haynesville Region

Drilling Productivity Report

December 2017

drilling data through November
projected production through January

Oil
0
barrels/day
month over month

33 January
33 December
barrels/day

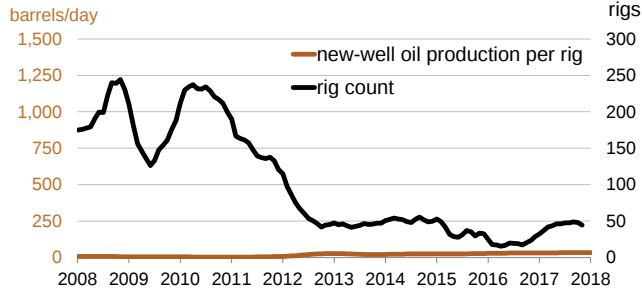
**Monthly
additions
from one
average rig**

January **8,023**
December **7,998**
thousand cubic feet/day

Gas
+25
thousand cubic feet/day
month over month

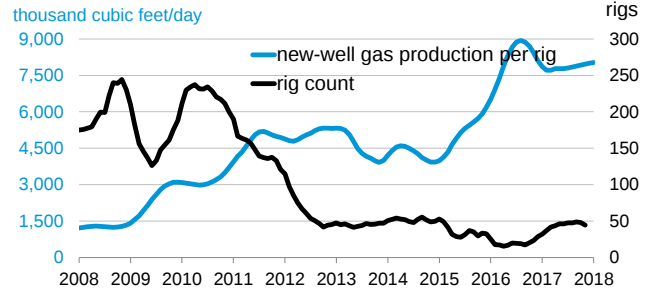
Haynesville Region

New-well oil production per rig



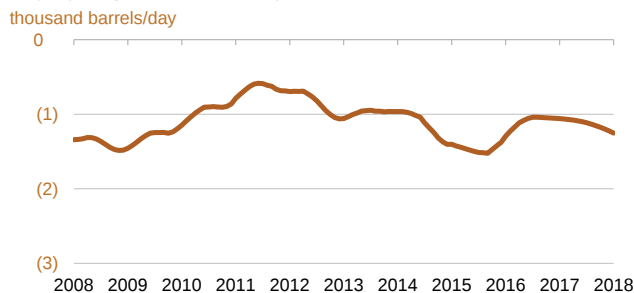
Haynesville Region

New-well gas production per rig



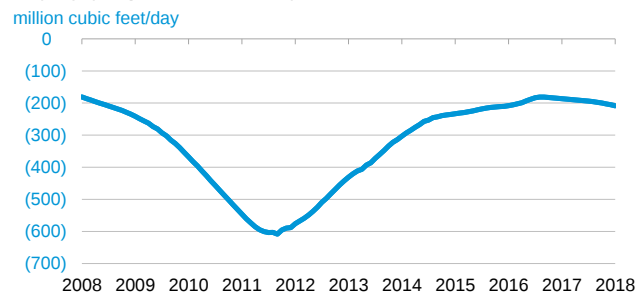
Haynesville Region

Legacy oil production change



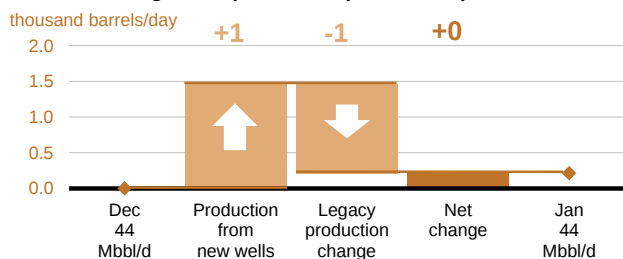
Haynesville Region

Legacy gas production change



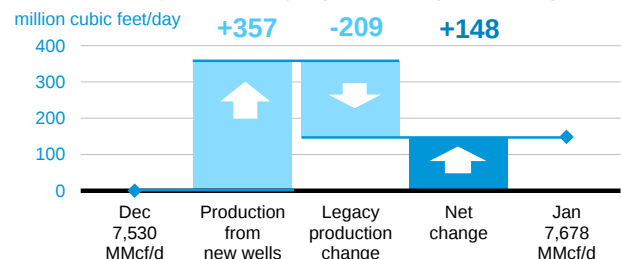
Haynesville Region

Indicated change in oil production (Jan vs. Dec)



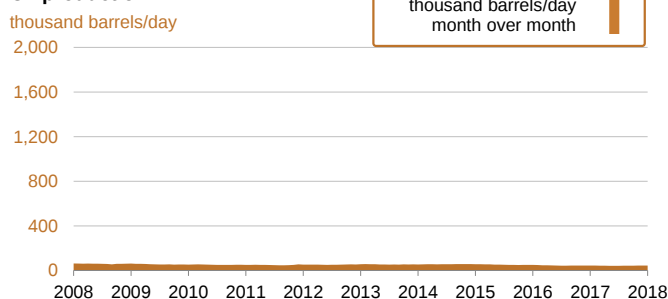
Haynesville Region

Indicated change in natural gas production (Jan vs. Dec)



Haynesville Region

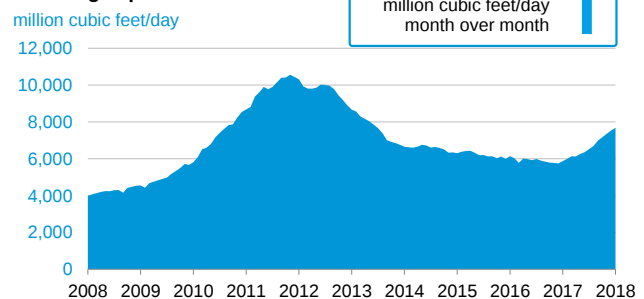
Oil production



Oil +0
thousand barrels/day
month over month

Haynesville Region

Natural gas production



Gas +148
million cubic feet/day
month over month

eia Niobrara Region

Drilling Productivity Report

December 2017
drilling data through November
projected production through January

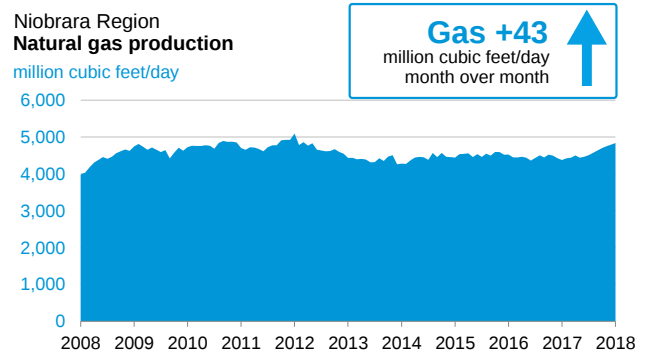
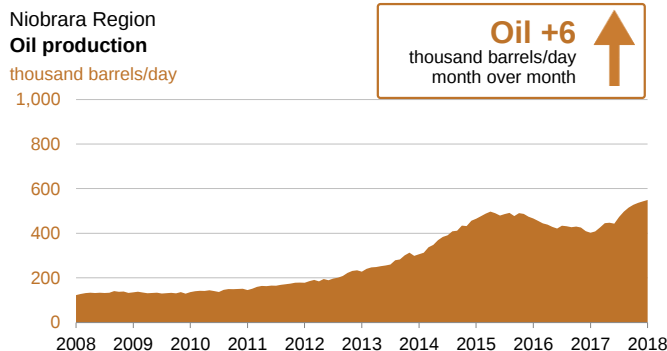
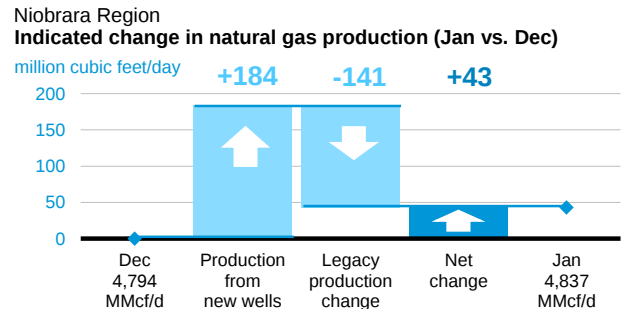
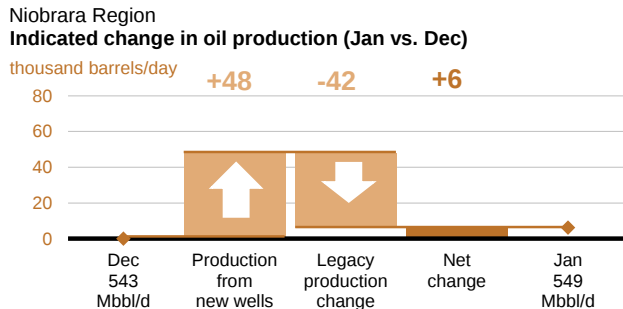
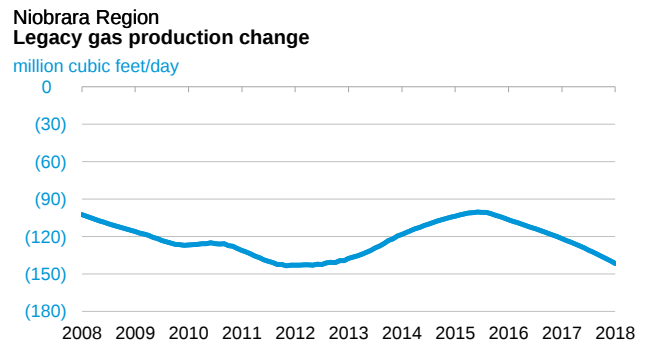
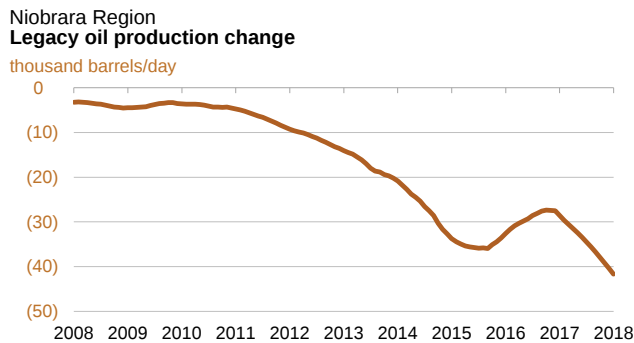
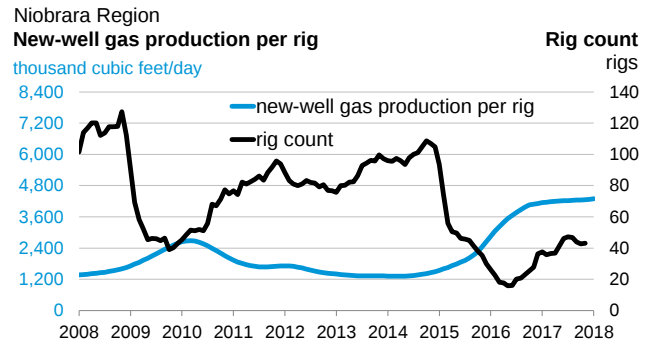
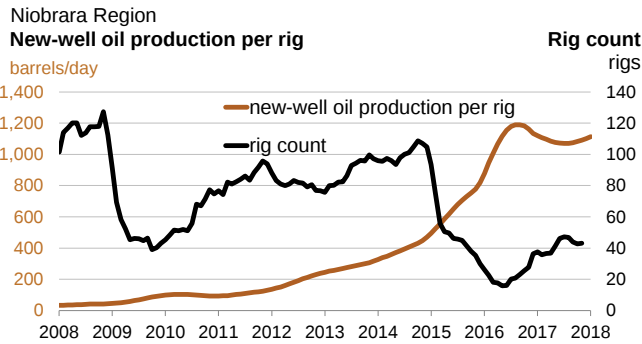
Oil +12
barrels/day
month over month

1,113 January
1,101 December
barrels/day

Monthly additions from one average rig

January **4,290**
December **4,275**
thousand cubic feet/day

Gas +15
thousand cubic feet/day
month over month



eia Permian Region

Drilling Productivity Report

December 2017
drilling data through November
projected production through January

Oil +4
barrels/day
month over month

614 January
610 December
barrels/day

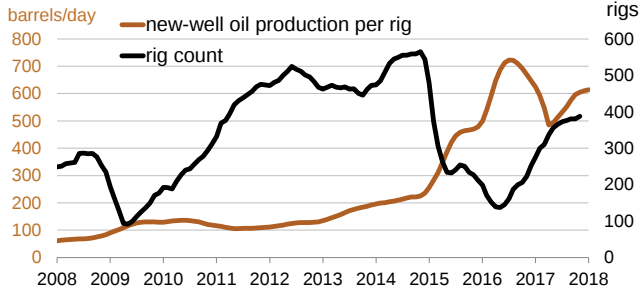
Monthly additions from one average rig

January **1,082**
December **1,067**
thousand cubic feet/day

Gas +15
thousand cubic feet/day
month over month

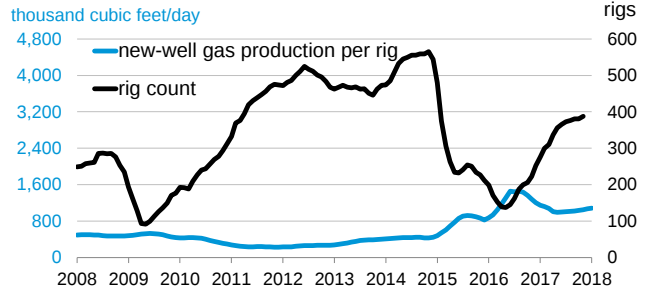
Permian Region

New-well oil production per rig



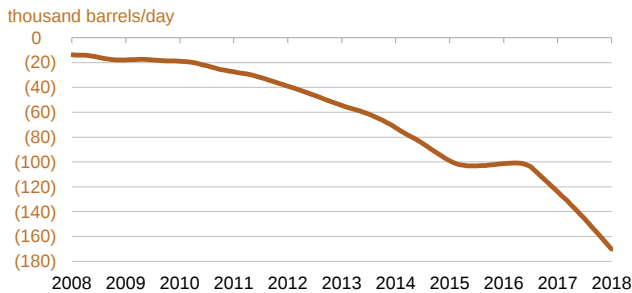
Permian Region

New-well gas production per rig



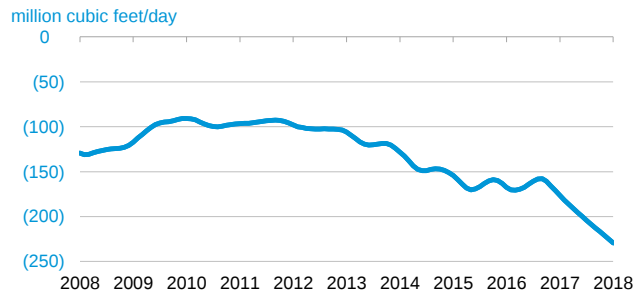
Permian Region

Legacy oil production change



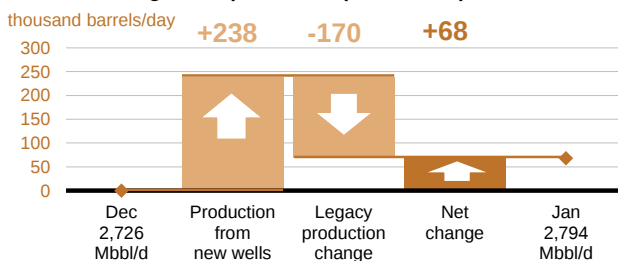
Permian Region

Legacy gas production change



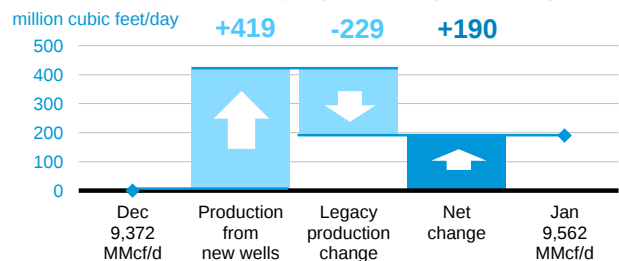
Permian Region

Indicated change in oil production (Jan vs. Dec)



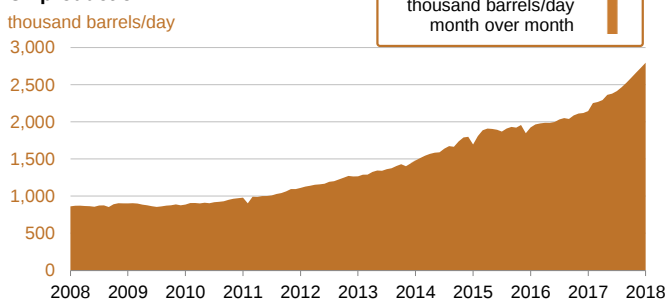
Permian Region

Indicated change in natural gas production (Jan vs. Dec)



Permian Region

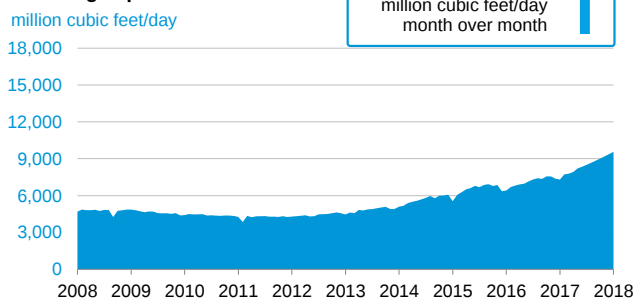
Oil production



Oil +68
thousand barrels/day
month over month

Permian Region

Natural gas production



Gas +190
million cubic feet/day
month over month



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 oil¹ and natural gas² 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's³ contribution to production of oil and natural gas from new wells.⁴ 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.⁵ 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

Oklahoma Corporation Commission (<http://www.occeweb.com/og/oghome.htm>) Source of well production, permit, and completion data in the counties associated with this report in Oklahoma