Drilling Productivity Report
For key tight oil and shale gas regions

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Drilling Productivity Report

July 2023

Drilling data through June
Projected production through August

New-well oil production per rig
barrels/day

August-2022  August-2023

Anadarko  Appalachia  Bakken  Eagle Ford  Haynesville  Niobrara  Permian

Legacy oil production change
thousand barrels/day

August-2022  August-2023

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

August-2022  August-2023

Anadarko  Appalachia  Bakken  Eagle Ford  Haynesville  Niobrara  Permian

Legacy gas production change
million cubic feet/day

August-2022  August-2023

Indicated monthly change in oil production (Aug vs. Jul)
thousand barrels/day

August-2022  August-2023

Indicated monthly change in gas production (Aug vs. Jul)
million cubic feet/day

August-2022  August-2023

Oil production
thousand barrels/day

August-2022  August-2023

Natural gas production
million cubic feet/day

August-2022  August-2023

Anadarko  Appalachia  Bakken  Eagle Ford  Haynesville  Niobrara  Permian

U. S. Energy Information Administration  |  Drilling Productivity Report 2
Anadarko Region
Drilling Productivity Report

Anadarko Region
New-well oil production per rig
barrels/day

- July 2023 drilling data through June
- August 2023 projected production through August

- Monthly additions from one average rig:
  - August 2023: 679 barrels/day
  - July 2023: 686 barrels/day

- Anadarko Region
  - New-well oil production per rig:
    - Oil +7 barrels/day month over month
  - Rig count:
    - 300 rigs

- Anadarko Region
  - Legacy oil production change:
    - thousand barrels/day
  - Indicated change in oil production (Aug vs. Jul):
    - +30 thousand barrels/day
    - -32 thousand barrels/day
    - -2 thousand barrels/day

- Anadarko Region
  - New-well gas production per rig
    - thousand cubic feet/day
  - Rig count:
    - 300 rigs

- Anadarko Region
  - Legacy gas production change:
    - million cubic feet/day
  - Indicated change in natural gas production (Aug vs. Jul):
    - +182 million cubic feet/day
    - -246 million cubic feet/day
    - -64 million cubic feet/day

- Anadarko Region
  - Oil production:
    - thousand barrels/day month over month
    - Oil -2 thousand barrels/day

- Anadarko Region
  - Natural gas production:
    - million cubic feet/day month over month
    - Gas -64 million cubic feet/day

- Anadarko Region
  - Natural gas production:
    - million cubic feet/day
  - Rig count:
    - 300 rigs

- Anadarko Region
  - Rig count:
    - 300 rigs

- Anadarko Region
  - Rig count:
    - 300 rigs

- Anadarko Region
  - New-well gas production per rig:
    - thousand cubic feet/day
    - Rig count:
      - 300 rigs

- Anadarko Region
  - Legacy oil production change:
    - thousand barrels/day
  - Indicated change in oil production (Aug vs. Jul):
    - +30 thousand barrels/day
    - -32 thousand barrels/day
    - -2 thousand barrels/day

- Anadarko Region
  - New-well oil production per rig:
    - barrels/day
  - Rig count:
    - 300 rigs

- Anadarko Region
  - Legacy gas production change:
    - million cubic feet/day
  - Indicated change in natural gas production (Aug vs. Jul):
    - +182 million cubic feet/day
    - -246 million cubic feet/day
    - -64 million cubic feet/day
Appalachia Region

Monthly additions from one average rig

<table>
<thead>
<tr>
<th>Month</th>
<th>Oil</th>
<th>Gas</th>
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<tbody>
<tr>
<td>July</td>
<td>23,656</td>
<td>+36</td>
</tr>
<tr>
<td>August</td>
<td>23,692</td>
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Appalachia Region
Monthly additions from one average rig

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<tr>
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Appalachia Region
New-well oil production per rig

- New-well oil production per rig
- Rig count

<table>
<thead>
<tr>
<th>Year</th>
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Appalachia Region
Legacy oil production change

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Appalachia Region
New-well gas production per rig

- New-well gas production per rig
- Rig count

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<tr>
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Appalachia Region
Natural gas production

- New-well gas production per rig
- Rig count

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Appalachia Region
Indicated change in oil production (Aug vs. Jul)

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<th>Oil</th>
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<tbody>
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Appalachia Region
Indicated change in natural gas production (Aug vs. Jul)

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<th>Month</th>
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<tbody>
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Appalachia Region
Oil production

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Appalachia Region
Natural gas production

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Bakken Region Drilling Productivity Report

**July 2023**

**Oil**
- **1,686** barrels/day in August
- **1,662** barrels/day in July

**Monthly additions from one average rig**
- August: **2,618** thousand cubic feet/day
- July: **2,572** thousand cubic feet/day

**Gas**
- **+46** thousand cubic feet/day month over month

**New-well oil production per rig**
- **2013 to 2023**

**Legacy oil production change**
- **2013 to 2023**

**Indicated change in oil production (Aug vs. Jul)**
- **+59** thousand barrels/day
- **-55** thousand barrels/day
- **+4** thousand barrels/day

**New-well gas production per rig**
- **2013 to 2023**

**Legacy gas production change**
- **2013 to 2023**

**Indicated change in natural gas production (Aug vs. Jul)**
- **+92** million cubic feet/day
- **-67** million cubic feet/day
- **+25** million cubic feet/day

**New-well gas production**
- **2013 to 2023**

**Natural gas production**
- **2013 to 2023**

**Monthly additions from one average rig**
- August: **2,618** thousand cubic feet/day
- July: **2,572** thousand cubic feet/day

**Oil production**
- **2013 to 2023**

**Natural gas production**
- **2013 to 2023**

**Month over month**
- **+24** thousand barrels/day
- **+46** thousand cubic feet/day

**Projected data** through June

**Drilling data** through June

**Projected production through August**

**July 2023**

**Barrels/day**

**1,218** barrels/day in July

**Mmbbl/d**

**1,222** Mmbbl/d in August

**MMcf/d**

**3,247** MMcf/d in July

**3,272** MMcf/d in August

**Oil**

**+4** thousand barrels/day month over month

**Gas**

**+25** million cubic feet/day month over month
Haynesville Region
Drilling Productivity Report

July 2023

Monthly additions from one average rig

- Drilling Productivity Report
- U. S. Energy Information Administration
- Drilling data through June
- Projected production through August

**New-well oil production per rig**

- 2013: 2,500 barrels/day
- 2014: 2,000 barrels/day
- 2015: 1,500 barrels/day
- 2016: 1,000 barrels/day
- 2017: 500 barrels/day
- 2018: 100 barrels/day
- 2019: 50 barrels/day
- 2020: 25 barrels/day
- 2021: 15 barrels/day
- 2022: 5 barrels/day
- 2023: 0 barrels/day

**Rig count**

- 2013: 80 rigs
- 2014: 70 rigs
- 2015: 60 rigs
- 2016: 50 rigs
- 2017: 40 rigs
- 2018: 30 rigs
- 2019: 20 rigs
- 2020: 10 rigs
- 2021: 5 rigs
- 2022: 0 rigs
- 2023: 0 rigs

**Legacy oil production change**

- 2013: +400 thousand barrels/day
- 2014: +200 thousand barrels/day
- 2015: +100 thousand barrels/day
- 2016: +50 thousand barrels/day
- 2017: +25 thousand barrels/day
- 2018: +15 thousand barrels/day
- 2019: +10 thousand barrels/day
- 2020: +5 thousand barrels/day
- 2021: 0 thousand barrels/day
- 2022: -5 thousand barrels/day
- 2023: -10 thousand barrels/day

**Indicated change in oil production (Aug vs. Jul)**

- 2013: +1 thousand barrels/day
- 2014: -1 thousand barrels/day
- 2015: 0 thousand barrels/day

**New-well gas production per rig**

- 2013: 15,000 thousand cubic feet/day
- 2014: 12,000 thousand cubic feet/day
- 2015: 9,000 thousand cubic feet/day
- 2016: 6,000 thousand cubic feet/day
- 2017: 3,000 thousand cubic feet/day
- 2018: 1,000 thousand cubic feet/day
- 2019: 500 thousand cubic feet/day
- 2020: 200 thousand cubic feet/day
- 2021: 100 thousand cubic feet/day
- 2022: 50 thousand cubic feet/day
- 2023: 0 thousand cubic feet/day

**Rig count**

- 2013: 80 rigs
- 2014: 70 rigs
- 2015: 60 rigs
- 2016: 50 rigs
- 2017: 40 rigs
- 2018: 30 rigs
- 2019: 20 rigs
- 2020: 10 rigs
- 2021: 5 rigs
- 2022: 0 rigs
- 2023: 0 rigs

**Legacy gas production change**

- 2013: -2,000 million cubic feet/day
- 2014: -1,000 million cubic feet/day
- 2015: -500 million cubic feet/day
- 2016: -250 million cubic feet/day
- 2017: -125 million cubic feet/day
- 2018: -50 million cubic feet/day
- 2019: -25 million cubic feet/day
- 2020: -12.5 million cubic feet/day
- 2021: -5 million cubic feet/day
- 2022: -2.5 million cubic feet/day
- 2023: -1.25 million cubic feet/day

**Indicated change in natural gas production (Aug vs. Jul)**

- 2013: +645 million cubic feet/day
- 2014: -695 million cubic feet/day
- 2015: -50 million cubic feet/day

**Oil production**

- 2013: 18,000 thousand barrels/day
- 2014: 16,000 thousand barrels/day
- 2015: 14,000 thousand barrels/day
- 2016: 12,000 thousand barrels/day
- 2017: 10,000 thousand barrels/day
- 2018: 8,000 thousand barrels/day
- 2019: 6,000 thousand barrels/day
- 2020: 4,000 thousand barrels/day
- 2021: 2,000 thousand barrels/day
- 2022: 1,000 thousand barrels/day
- 2023: 500 thousand barrels/day

**Natural gas production**

- 2013: 16,649 MMcf/day
- 2014: 16,599 MMcf/day
- 2015: 16,549 MMcf/day
- 2016: 16,509 MMcf/day
- 2017: 16,469 MMcf/day
- 2018: 16,429 MMcf/day
- 2019: 16,389 MMcf/day
- 2020: 16,349 MMcf/day
- 2021: 16,309 MMcf/day
- 2022: 16,269 MMcf/day
- 2023: 16,229 MMcf/day
Permian Region
Drilling Productivity Report

July 2023

- Oil +3 barrels/day month over month
- Gas +6 thousand cubic feet/day month over month

Monthly additions from one average rig

- August 1,061 barrels/day
- July 1,058 barrels/day

Permian Region New-well oil production per rig
- barrels/day
- 1,600 to 0
- 2013 to 2023

Permian Region New-well gas production per rig
- thousand cubic feet/day
- 9,600 to 0
- 2013 to 2023

Permian Region Legacy oil production change
- thousand barrels/day
- 800 to (1,200)
- 2013 to 2023

Permian Region Legacy gas production change
- million cubic feet/day
- 2,000 to (3,000)
- 2013 to 2023

Permian Region Indicated change in oil production (Aug vs. Jul)
- thousand barrels/day
- +363, -374, -11
- July 5,775 Mbbl/d, August 5,764 Mbbl/d

Permian Region Indicated change in natural gas production (Aug vs. Jul)
- million cubic feet/day
- +695, -659, +36
- July 23,353 MMcf/d, August 23,389 MMcf/d

Permian Region Oil production
- thousand barrels/day
- 100 to 6,000
- 2013 to 2023

Permian Region Natural gas production
- million cubic feet/day
- 0 to 36,000
- 2013 to 2023

New-well oil production per rig

- barrels/day
- 1,600 to 0
- 2013 to 2023

New-well gas production per rig

- thousand cubic feet/day
- 9,600 to 0
- 2013 to 2023

Rig count
- rigs
- 0 to 600
- 2013 to 2023

Rig count
- rigs
- 0 to 600
- 2013 to 2023

Production from new wells

- barrels/day
- 0 to 6,000
- 2013 to 2023

Legacy production change

- thousand barrels/day
- 0 to (1,200)
- 2013 to 2023

Net change

- thousand barrels/day
- 0 to (1,200)
- 2013 to 2023

Production from new wells

- barrels/day
- 0 to 6,000
- 2013 to 2023

Legacy production change

- million cubic feet/day
- 2,000 to (3,000)
- 2013 to 2023

Net change

- million cubic feet/day
- 0 to 36,000
- 2013 to 2023
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 and natural gas 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 contribution to production of oil and natural gas from new wells. 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. 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.
Sources
Drilling Productivity Report

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