Note:

The DPR rig productivity metric *new-well oil/gas production per rig* can become unstable during periods of rapid decreases or increases in the number of active rigs and well completions. The metric uses a fixed ratio of estimated total production from new wells divided by the region's monthly rig count, lagged by two months. The metric does not represent new-well oil/natural gas production per newly completed well.

The DPR metric *legacy oil/gas production change* can become unstable during periods of rapid decreases or increases in the volume of well production curtailments or shut-ins. This effect has been observed during winter weather freeze-offs, extreme flooding events, and the 2020 global oil demand contraction. The DPR methodology involves applying smoothing techniques to most of the data series because of inherent noise in the data.

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## Year-over-year summary

### Drilling Productivity Report

- **November 2022**
- Drilling data through October
- Projected production through December

### New-well oil production per rig

<table>
<thead>
<tr>
<th>Region</th>
<th>December-2021</th>
<th>December-2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anadarko</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appalachia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bakken</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eagle Ford</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haynesville</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Niobrara</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permian</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Legacy oil production change

<table>
<thead>
<tr>
<th>Region</th>
<th>December-2021</th>
<th>December-2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anadarko</td>
<td>(50)</td>
<td>(100)</td>
</tr>
<tr>
<td>Appalachia</td>
<td>(150)</td>
<td>(200)</td>
</tr>
<tr>
<td>Bakken</td>
<td>(250)</td>
<td>(300)</td>
</tr>
<tr>
<td>Eagle Ford</td>
<td>(350)</td>
<td>(400)</td>
</tr>
<tr>
<td>Haynesville</td>
<td>(500)</td>
<td>(550)</td>
</tr>
<tr>
<td>Niobrara</td>
<td>(600)</td>
<td>(650)</td>
</tr>
<tr>
<td>Permian</td>
<td>(700)</td>
<td>(750)</td>
</tr>
</tbody>
</table>

### Indicated monthly change in oil production (Dec vs. Nov)

<table>
<thead>
<tr>
<th>Region</th>
<th>December-2021</th>
<th>December-2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anadarko</td>
<td>-360</td>
<td>-180</td>
</tr>
<tr>
<td>Appalachia</td>
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</tr>
<tr>
<td>Bakken</td>
<td>0</td>
<td>180</td>
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<tr>
<td>Eagle Ford</td>
<td>360</td>
<td>540</td>
</tr>
<tr>
<td>Haynesville</td>
<td>540</td>
<td>720</td>
</tr>
<tr>
<td>Niobrara</td>
<td>720</td>
<td>900</td>
</tr>
<tr>
<td>Permian</td>
<td>900</td>
<td>1080</td>
</tr>
</tbody>
</table>

### Legacy gas production change

<table>
<thead>
<tr>
<th>Region</th>
<th>December-2021</th>
<th>December-2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anadarko</td>
<td>(300)</td>
<td>(600)</td>
</tr>
<tr>
<td>Appalachia</td>
<td>(600)</td>
<td>(900)</td>
</tr>
<tr>
<td>Bakken</td>
<td>(900)</td>
<td>(1200)</td>
</tr>
<tr>
<td>Eagle Ford</td>
<td>(1200)</td>
<td>(1500)</td>
</tr>
<tr>
<td>Haynesville</td>
<td>(1500)</td>
<td>(1800)</td>
</tr>
<tr>
<td>Niobrara</td>
<td>(1800)</td>
<td>(2100)</td>
</tr>
<tr>
<td>Permian</td>
<td>(2100)</td>
<td>(2400)</td>
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</table>

### Indicated monthly change in gas production (Dec vs. Nov)

<table>
<thead>
<tr>
<th>Region</th>
<th>December-2021</th>
<th>December-2022</th>
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</thead>
<tbody>
<tr>
<td>Anadarko</td>
<td>-200</td>
<td>-100</td>
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<tr>
<td>Appalachia</td>
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<td>0</td>
</tr>
<tr>
<td>Bakken</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Eagle Ford</td>
<td>200</td>
<td>300</td>
</tr>
<tr>
<td>Haynesville</td>
<td>300</td>
<td>400</td>
</tr>
<tr>
<td>Niobrara</td>
<td>400</td>
<td>500</td>
</tr>
<tr>
<td>Permian</td>
<td>500</td>
<td>600</td>
</tr>
</tbody>
</table>

### Oil production

<table>
<thead>
<tr>
<th>Region</th>
<th>December-2021</th>
<th>December-2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anadarko</td>
<td></td>
<td></td>
</tr>
<tr>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Niobrara</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permian</td>
<td></td>
<td></td>
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</tbody>
</table>

### Natural gas production

<table>
<thead>
<tr>
<th>Region</th>
<th>December-2021</th>
<th>December-2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anadarko</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appalachia</td>
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<tr>
<td>Bakken</td>
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<td>Eagle Ford</td>
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<td>Haynesville</td>
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<td></td>
<td></td>
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<tr>
<td>Permian</td>
<td></td>
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</tbody>
</table>
Anadarko Region

Drilling Productivity Report

November 2022

Monthly additions from one average rig

December

November

Gas +7

thousand cubic feet/day

month over month

Drilling data through October

Projected production through December

Oil +1

barrels/day

month over month

-1

barrels/day

Month over month

Anadarko Region

New-well oil production per rig

barrels/day

Rig count

rigs

Anadarko Region

Legacy oil production change

thousand barrels/day

Anadarko Region

Indicated change in oil production (Dec vs. Nov)
thousand barrels/day

New-well oil production per rig

barrels/day

new-well oil production per rig

-rig count

New-well gas production per rig

thousand cubic feet/day

new-well gas production per rig

-rig count

Legacy gas production change

million cubic feet/day

Indicated change in natural gas production (Dec vs. Nov)
million cubic feet/day

Oil production

thousand barrels/day

Gas production

million cubic feet/day

Oil +8

thousand barrels/day

month over month

Gas +4

million cubic feet/day

month over month

Oil production

thousand barrels/day

Oil +8

month over month

-1

barrels/day

Month over month

Legacy oil production change

thousand barrels/day

Indicated change in oil production (Dec vs. Nov)
thousand barrels/day

New-well gas production per rig

thousand cubic feet/day

New-well gas production per rig

-rig count

Anadarko Region

Natural gas production

million cubic feet/day

Anadarko Region

Natural gas production

million cubic feet/day

November

December

Anadarko Region

New-well gas production per rig

thousand cubic feet/day

Rig count

rigs

Anadarko Region

Legacy gas production change

million cubic feet/day

Indicated change in natural gas production (Dec vs. Nov)
million cubic feet/day

Oil +8

month over month

Gas +4

month over month
Bakken Region
Drilling Productivity Report

Monthly additions from one average rig
- Oil: 1,710 barrels/day in December
- Gas: 2,535 thousand cubic feet/day in December

Indicated change in oil production (Dec vs. Nov)
- New-well oil production per rig: +14 barrels/day month over month
- Legacy oil production change: +19 thousand barrels/day

Indicated change in natural gas production (Dec vs. Nov)
- New-well gas production per rig: +25 thousand cubic feet/day month over month
- Legacy gas production change: +29 million cubic feet/day

Bakken Region
Net change in oil production (Dec vs. Nov)
+19 thousand barrels/day

Bakken Region
Net change in gas production (Dec vs. Nov)
+29 million cubic feet/day
Niobrara Region

Drilling Productivity Report

November 2022

drilling data through October
projected production through December

Oil
-7 barrels/day

month over month

1,388 December
1,395 November

bars/day

Monthly additions from one average rig

Gas
-53 thousand cubic feet/day

month over month

3,492 December
3,545 November

thousand cubic feet/day

Niobrara Region New-well oil production per rig

Niobrara Region Legacy oil production change

Niobrara Region Indicated change in oil production (Dec vs. Nov)

Niobrara Region New-well gas production per rig

Niobrara Region Legacy gas production change

Niobrara Region Indicated change in natural gas production (Dec vs. Nov)

Niobrara Region Oil production

Niobrara Region Natural gas production

U. S. Energy Information Administration | Drilling Productivity Report
Permian Region
Drilling Productivity Report

**Oil**
-12 thousand barrels/day month over month

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

Permian Region
Legacy oil production change
thousand barrels/day

Permian Region
Indicated change in oil production (Dec vs. Nov)
thousand barrels/day

Permian Region
Oil production
thousand barrels/day

**Gas**
-23 thousand cubic feet/day month over month

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

Permian Region
Legacy gas production change
million cubic feet/day

Permian Region
Indicated change in natural gas production (Dec vs. Nov)
million cubic feet/day

Permian Region
Natural gas production
million cubic feet/day

**Projected production through December**

- New-well oil production per rig
  - 2012: 1,200
  - 2013: 1,000
  - 2014: 800
  - 2015: 600
  - 2016: 400
  - 2017: 200
  - 2018: 100
  - 2019: 0
  - 2020: 0
  - 2021: 0
  - 2022: 0

- Legacy oil production change
  - 2012: 800
  - 2013: 400
  - 2014: 200
  - 2015: 100
  - 2016: 0
  - 2017: 0
  - 2018: 0
  - 2019: 0
  - 2020: 0
  - 2021: 0
  - 2022: 0

- Indicated change in oil production (Dec vs. Nov)
  - November: +39 thousand barrels/day
  - December: +39 thousand barrels/day

- Oil production
  - 2012: 1,000
  - 2020: 3,000
  - 2022: 6,000

- Legacy gas production change
  - 2012: -23 thousand cubic feet/day
  - 2013: -23 thousand cubic feet/day
  - 2014: -23 thousand cubic feet/day
  - 2015: -23 thousand cubic feet/day
  - 2016: -23 thousand cubic feet/day
  - 2017: -23 thousand cubic feet/day
  - 2018: -23 thousand cubic feet/day
  - 2019: -23 thousand cubic feet/day
  - 2020: -23 thousand cubic feet/day
  - 2021: -23 thousand cubic feet/day
  - 2022: -23 thousand cubic feet/day

- New-well gas production per rig
  - 2012: 1,200
  - 2013: 1,000
  - 2014: 800
  - 2015: 600
  - 2016: 400
  - 2017: 200
  - 2018: 100
  - 2019: 0
  - 2020: 0
  - 2021: 0
  - 2022: 0

- Legacy gas production change
  - 2012: +723 million cubic feet/day
  - 2013: +723 million cubic feet/day
  - 2014: +723 million cubic feet/day
  - 2015: +723 million cubic feet/day
  - 2016: +723 million cubic feet/day
  - 2017: +723 million cubic feet/day
  - 2018: +723 million cubic feet/day
  - 2019: +723 million cubic feet/day
  - 2020: +723 million cubic feet/day
  - 2021: +723 million cubic feet/day
  - 2022: +723 million cubic feet/day

- Indicated change in natural gas production (Dec vs. Nov)
  - November: +125 million cubic feet/day
  - December: +125 million cubic feet/day

- Natural gas production
  - 2012: 1,000
  - 2013: 2,000
  - 2014: 3,000
  - 2015: 4,000
  - 2016: 5,000
  - 2017: 6,000
  - 2018: 7,000
  - 2019: 8,000
  - 2020: 9,000
  - 2021: 10,000
  - 2022: 11,000
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.
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