Preliminary AEO2018 Macroeconomic Results

For
Macroeconomic Working Group
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By
Macroeconomic Analysis Team
Key preliminary results

• Preliminary AEO2018 real GDP grows an average of 2.1% from 2017-2050, similar to AEO2017 and other projections/forecasts

• Preliminary AEO2018 manufacturing output grows 2.2% per year on average from 2017-40, nonmanufacturing 1.5%; both similar to AEO2017

• Preliminary AEO2018 employment growth is concentrated in services and construction
Summary of the Macroeconomic Activity Module (MAM) in the National Energy Modeling System (NEMS)

- **NEMS**
  - NEMS macro baseline variables
  - NEMS energy variables
  - Other NEMS modules

- **MAM**
  - Macroeconomic submodule runs the New Scenario using new Energy Inputs from NEMS
  - Industrial submodule runs the New Scenario of values of shipments by industry sectors
  - Employment submodule runs the New Scenario of employment by sector
  - Regional submodule
    - Commercial floorspace submodule

MAM applies the ratios of the New Scenario values more than the Baseline values onto the Macro Baseline variables to obtain solution.
Key changes from last AEO

• Added 70 energy-related variables to the U.S. model

• Aggregated employment model for industries to higher-level NAICS designations

• Improved the regional industrial output model

• Updated historical data

• Planned for testing:
  – Industrial feedback model
  – Technology side case model
Growth in GDP and most of its components is slower in the preliminary AEO2018 projection than history.

Average annual percent growth

- Imports: 3.7% (Preliminary), 5.1% (Previous 27 Year Growth)
- Exports: 3.9% (Preliminary), 4.8% (Previous 27 Year Growth)
- Fixed Residential Investment: 1.0% (Preliminary), 1.2% (Previous 27 Year Growth)
- Fixed Nonresidential Investment: 3.0% (Preliminary), 3.8% (Previous 27 Year Growth)
- Consumption: 2.2% (Preliminary), 2.7% (Previous 27 Year Growth)
- Real GDP: 2.1% (Preliminary), 2.4% (Previous 27 Year Growth)

Source: AEO2018 Preliminary run
The preliminary AEO2018 projection for GDP and its components is similar to recent projections.

average annual percent growth

- Real GDP
- Fixed Nonresidential Investment
- Fixed Residential Investment
- Exports
- Imports

Source: AEO2018 Preliminary run
Economic growth in major trading partners slows over the projection period while the dollar gradually depreciates.

Source: AEO2018 Preliminary run
Demographic factors are an important component of the macroeconomic projections.

Population million persons

Source: AEO2018 Preliminary run

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Inflation remains moderate throughout the projection and bond yields gradually rise from historic lows.

Source: AEO2018 Preliminary run
Consumption’s importance in the demand mix fades as non-residential investment becomes more important

change in GDP share

Source: AEO2018 Preliminary run
Preliminary AEO2018 real GDP growth is similar to other forecasts/projections

<table>
<thead>
<tr>
<th>Projection</th>
<th>2017-40</th>
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<tbody>
<tr>
<td>AEO 2018</td>
<td>2.2</td>
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<td>AEO 2017</td>
<td>2.2</td>
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<tr>
<td>IHSM (May 2016)</td>
<td>2.2</td>
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<tr>
<td>CBO (July 2017)</td>
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<tr>
<td>OASDI (2017)</td>
<td>2.3</td>
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<tr>
<td>Oxford (July 2017)</td>
<td>1.6</td>
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Sources: as listed
Services are the largest sector, metal-based durables grow the fastest

Source: AEO2018 Preliminary run
Very little change in overall industrial sector output despite revised baseline, no price or individual industry updates yet

Source: IHS Markit, AEO2017, AEO2018 Preliminary run; bulk chemicals includes NAICS 3251-3
Industrial sector shipments grow fastest in nonenergy-intensive manufacturing, primarily due to share loss in energy-intensives

Source: AEO2018 Preliminary run
Bulk chemicals output not yet estimated on new energy prices or other updates, major changes expected

Source: IHS Markit, AEO2017, AEO2018 Preliminary run; bulk chemicals includes NAICS 3251-3
Primary metals output also not estimated with updated prices, some revision possible

Source: IHS Markit, AEO2017, AEO2018 Preliminary run; primary metals includes all NAICS 331
Metal-based durables output relatively insensitive to price so less change expected

Source: IHS Markit, AEO2017, AEO2018 Preliminary run; metal-based durables includes NAICS 332-6
Employment increases most in services and construction

Source: AEO Preliminary run; MBD = metal-based durables, EI = energy-intensive, man. = manufacturing
Regional results reveal manufacturing remains largest in Midwest, greatest overall gains in Mountain West

Source: AEO2018 Preliminary run
Thank you

Annual Energy Outlook | www.eia.gov/forecasts/aeo

Short-Term Energy Outlook | www.eia.gov/forecasts/steo

International Energy Outlook | www.eia.gov/forecasts/ieo

Today In Energy | www.eia.gov/todayinenergy

Monthly Energy Review | www.eia.gov/totalenergy/data/monthly

State Energy Portal | www.eia.gov/state