Long-term Outlook for Oil and Other Liquid Fuels

Saudi Arabia - United States Energy Consultations
February 2, 2011
Washington, D.C.

Richard G. Newell, Administrator
What is included (and excluded) in developing EIA’s “Reference Case” projections?

• Generally assumes current laws and regulations
  – excludes potential future laws and regulations (e.g., proposed greenhouse gas legislation and proposed fuel economy standards are not included)
  – provisions sunset as specified in law (e.g., renewable tax credits expire)

• Includes technologies that are commercial or reasonably expected to become commercial over next decade or so
  – includes projected cost and efficiency improvements due to technology improvements, as well as cost reductions linked to cumulative deployment levels.
  – does not assume revolutionary or breakthrough technologies
Oil prices in the Reference case rise steadily; the full AEO2011 will include a wide range of oil prices.

The chart shows the annual average price of low sulfur crude oil in real 2009 dollars per barrel. The chart displays data from 1980 to 2035, with projections for future years. The chart includes a line for the high oil price scenario and another for the low oil price scenario. The AEO2011 Reference line is also shown.

Source: EIA, Annual Energy Outlook 2011
Economic activity and population drive increases in oil use; energy intensity improvements moderate this trend

Average annual change (2007-2035)

Percent per year

Source: EIA, Annual Energy Outlook 2011

* Oil includes other liquids and refinery gains

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Non-OECD liquids fuel use surpasses almost flat OECD fuel use by 2020

Source: EIA, Annual Energy Outlook 2011
China accounts for 40%, India for 10%, and the Middle East for 16% of projected liquids consumption growth.
OPEC’s share of liquids rises slightly to 42% of total liquids production in EIA’s Reference case; unconventional liquids more than triple.

liquids production
million barrel per day

Source: EIA, Annual Energy Outlook 2011
Growth in OPEC conventional production comes primarily from Saudi Arabia, Iraq, and other Middle East countries.

Conventional liquids production
million barrels per day

Source: EIA, Annual Energy Outlook 2011

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Brazil, Russia, the United States, and Kazakhstan lead increases in non-OPEC conventional supplies

conventional liquids production
million barrels per day

Source: EIA, Annual Energy Outlook 2011
Canadian oil sands and biofuels from Brazil and the U.S. account for 65% of the increase in unconventional liquids production.

Unconventional liquids production million barrels per day

- **Oil sands/bitumen**
- **Biofuels**
- **Coal-to-liquids**
- **Extra-heavy oil**
- **Gas-to-liquids**
- **Shale oil**

Source: EIA, Annual Energy Outlook 2011

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U.S. imports of liquid fuels fall due to increased domestic production—including biofuels—and greater fuel efficiency.

U.S. liquid fuels consumption
million barrels per day

<table>
<thead>
<tr>
<th>Year</th>
<th>History</th>
<th>Projections</th>
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<td>1970</td>
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Natural gas plant liquids:
- History: 42%
- Projections: 13%

Liquids from coal:
- History: 52%
- Projections: 42%

Biofuels including imports:
- History: 12%
- Projections: 13%

Petroleum supply:
- History: 10%
- Projections: 2%

Net petroleum imports:
- History: 2%
- Projections: 2%

Source: EIA, Annual Energy Outlook 2011
Richard Newell, February 2, 2011
Biofuels, natural gas liquids, and crude oil production are key sources of increased domestic liquids supply.

U.S. liquid fuels
million barrels per day

- Net crude oil imports
- Net product imports
- Crude oil production
- Liquids from coal
- Natural gas plant liquids
- Biofuels (including net imports)
- Refinery processing gain

Total consumption

Source: EIA, Annual Energy Outlook 2011

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Unconventional vehicles meet over 40% of U.S. light-duty vehicle sales in 2035

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Source: EIA, Annual Energy Outlook 2011