AEO2012 Early Release Overview

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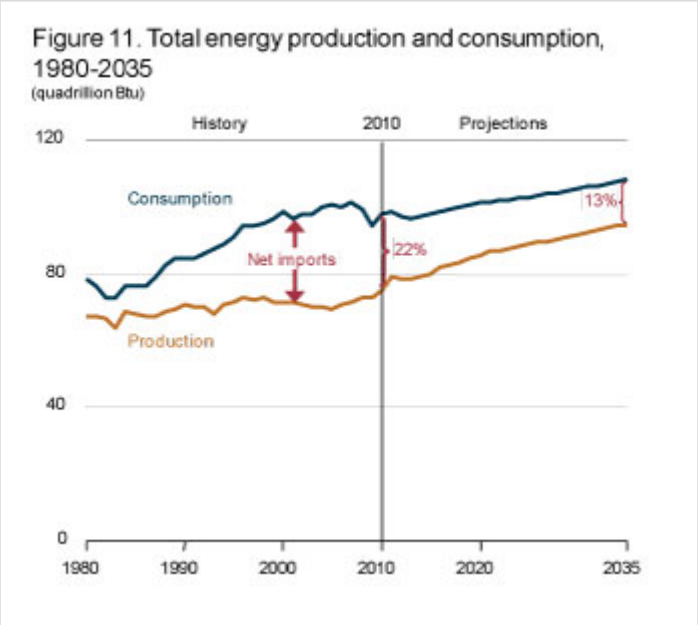
Energy Productions and Imports



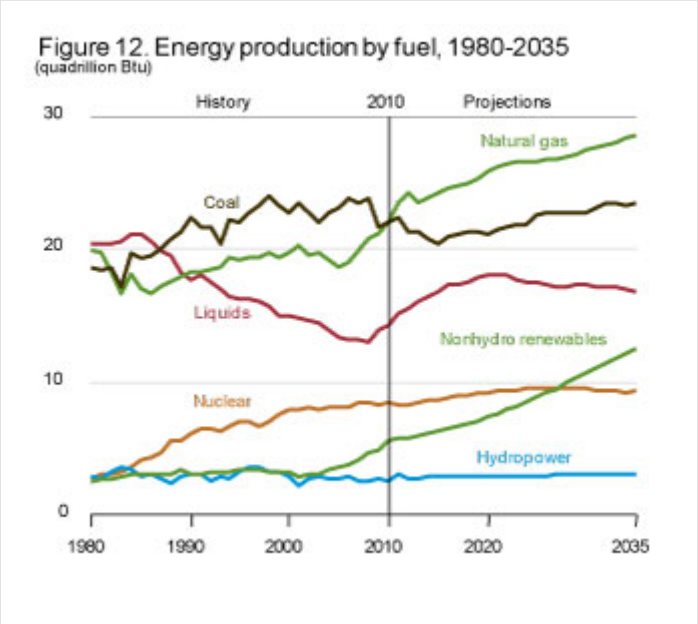


figure dataNet imports of energy decline both in absolute terms and as a share of total U.S. energy consumption in the AEO2012 Reference case (Figure 11). The decline in energy imports reflects increased domestic crude oil and natural gas production, increased use of biofuels (much of which are produced domestically), and demand reductions resulting from the adoption of new efficiency standards and from rising energy prices. The net import share of total U.S. energy consumption in 2035 is 13 percent, compared with 22 percent in 2010. (The share was 29 percent in 2007, but it dropped considerably during the recession.)

Liquids

figure dataU.S. production of domestic crude oil in the AEO2012 Reference case increases from 5.5 million barrels per day in 2010 to 6.7 million barrels per day in 2020, 11 percent higher than in AEO2011 (Figure 12). Even with a projected decline after 2020, U.S. crude oil production remains above 6.1 million barrels per day through 2035. The higher level of production results mainly from increased onshore oil production, predominantly tight oil. In AEO2012, onshore tight oil production accounts for 31 percent of lower 48 onshore oil production in 2035, compared with 21 percent in 2010. As with shale gas, the application of recent technology advances significantly increases the development of tight oil resources. Offshore crude oil production in the Gulf of Mexico trends upward over time, fluctuating between 1.4 and 2.0 million barrels per day, as new large development projects are started. Alaska's oil production decline is slowed by the development of offshore projects.

The faster growth in tight oil production in AEO2012 offsets slower growth in enhanced oil recovery (EOR) production, as the economics of tight oil plays are more favorable than the economics of CO2-EOR projects. In addition, the quantity of CO2 available in 2035 from planned CTL plants necessary for CO2-EOR production is 52 percent lower in AEO2012 than was projected in AEO2011, due to a reduction in the number of CTL projects expected in AEO2012.

Consequently, CO2-EOR in AEO2012 accounts for 11 percent of cumulative lower 48 onshore oil production from 2010 to 2035, as compared with 21 percent in AEO2011.

U.S. dependence on imported liquid fuels continues to decline in AEO2012, primarily as a result of increased domestic oil production, increased production of biofuels driven by the EISA2007 RFS, and lower demand for transportation fuels in AEO2012 compared with AEO2011. Imported liquid fuels as a share of total U.S. liquid fuel use reached 60 percent in 2005 and 2006 before falling to 50 percent in 2010, and the percentage continues to decline over the projection period in AEO2012, to 37 percent in 2035â€”significantly lower than the 42-percent share in AEO2011.

Although liquids production from many sources is higher in AEO2012 than was projected in the AEO2011 Reference case, production of advanced cellulosic biofuels is lower. Over the past three consecutive years, production goals for cellulosic ethanol in the EISA2007 RFS have not been achieved. While EIA has projected a need for waivers in all Reference case projections since the passage of the EISA2007 RFS, EIA's view of technology development and market penetration rates for cellulosic biofuel technologies has grown somewhat more pessimistic in AEO2012.

Natural Gas

Cumulative natural gas production from 2010 through 2035 in the AEO2012 Reference case is 7 percent higher than in AEO2011, even though the estimated natural gas resource base is lower. This primarily reflects increased shale gas production resulting from the application of recent technological advances, as well as continued drilling in shale plays with high concentrations of natural gas liquids and crude oil, which have a higher value in energy equivalent terms than dry natural gas. Production levels for tight gas and coalbed methane exceed those in the AEO2011 Reference case through 2035, making significant contributions to the overall increase in production. Offshore natural gas production in the Gulf of Mexico fluctuates between 2.0 and 2.8 trillion cubic feet per year as new large projects directed toward liquids development are started over time.

In the AEO2012 Reference case, the estimated unproved technically recoverable resource (TRR) of shale gas for the United States is 482 trillion cubic feet, substantially below the estimate of 827 trillion cubic feet in AEO2011. The decline largely reflects a decrease in the estimate for the Marcellus shale, from 410 trillion cubic feet to 141 trillion cubic feet. Both EIA and USGS have recently made significant revisions to their TRR estimates for the Marcellus shale. Drilling in the Marcellus accelerated rapidly in 2010 and 2011, so that there is far more information available today than a year ago. Indeed, the daily rate of Marcellus production doubled during 2011 alone. Using data though 2010, USGS updated its TRR estimate for the Marcellus to 84 trillion cubic feet, with a 90-percent confidence range from 43 to 144 trillion cubic feet—a substantial increase over the previous USGS estimate of 2 trillion cubic feet dating from 2002. For AEO2012, EIA uses more recent drilling and production data available through 2011 and excludes production experience from the pre-shale era (before 2008). EIA's TRR estimate for the entire Northeast also includes TRR of 16 trillion cubic feet for the Utica shale, which underlies the Marcellus and is still relatively little explored. The complete AEO2012 publication will include a more in-depth examination of the factors that affect resource estimates.

In the AEO2012 Reference case, the United States becomes a net exporter of LNG starting in 2016 and an overall net exporter of natural gas in 2021. U.S. LNG exports are assumed to start with a capacity of 1.1 billion cubic feet per day in 2016 and increase by an additional 1.1 billion cubic feet per day in 2019. Over the projection period, cumulative net pipeline imports of natural gas from Canada and Mexico in the AEO2012 Reference case are less than 50 percent of those projected in the AEO2011 Reference case, with the United States becoming a net pipeline exporter of natural gas in 2025. In the AEO2012 Reference case, net pipeline imports from Canada fall by 62 percent over the projection period, and net pipeline exports to Mexico grow by 440 percent. Cumulative U.S. LNG imports from 2011 through 2035 are down by 20 percent in AEO2012 compared with AEO2011, due in part to increased use of LNG in markets outside North America, strong domestic production, and relatively low U.S. natural gas prices in comparison with other global markets. As in the AEO2011 Reference case, the Alaska natural gas pipeline is not constructed in the AEO2012 Reference case, because assumed high capital costs and low natural gas wellhead prices make it uneconomical to proceed with the pipeline project over the projection period.

Coal

Although coal remains the leading fuel for U.S. electricity generation, its share of total generation is lower in the AEO2012 Reference case than was projected in the AEO2011 Reference case. As a consequence, while still growing in most projection years after 2015, total coal production is lower in the AEO2012 Reference case than in the AEO2011 Reference case, with the gap between the two outlooks increasing substantially over the period from 2020 to 2035.

In the AEO2012 Reference case, domestic coal production increases at an average rate of 0.3 percent per year, from 22.1 quadrillion Btu (1,084 million short tons) in 2010 to 23.5 quadrillion Btu (1,188 million short tons) in 2035. Mines in the West account for nearly all the projected increase in overall production, although even Western coal production is expected to decline somewhat between 2010 and 2015 as low natural gas prices and the retirement of a sizable amount of coal-fired generating capacity leads to a decline in overall coal consumption in the electricity sector. On a Btu basis, the share of domestic coal production originating from mines in the West increases from 47 percent in 2010 to 56 percent in 2035, and the Appalachian share declines from 39 percent to 29 percent during the same period, with most of the decline occurring by 2020. In the Interior region, coal production remains relatively stable over the projection period, with production in 2035 higher than in 2010.

Electricity generation currently accounts for 93 percent of total U.S. coal consumption. In the AEO2012 Reference case, projected coal consumption in the electric power sector in 2035 (19.6 quadrillion Btu) is about 2 quadrillion Btu less than in the AEO2011 Reference case (21.6 quadrillion Btu). For the most part, the reduced outlook for coal consumption in the electricity sector is the result of lower natural gas prices and higher coal prices that, taken together, support increased generation from natural gas in the AEO2012 Reference case. More generation from nonhydroelectric renewables and slightly lower overall demand for electricity, particularly in regions that rely heavily on coal-fired generation, also contribute to the reduced outlook for electricity sector coal consumption in the AEO2012 Reference case. With a more robust outlook for coal imports by Asian countries, AEO2012 shows higher coal exports than AEO2011.