Short-Term Energy Outlook (STEO)

Highlights

- North Sea Brent crude oil prices averaged $60/barrel (b) in April, a $4/b increase from March and the highest monthly average of 2015. Despite increasing global inventories, several factors contributed to higher prices in April, including indications of higher global oil demand growth, expectations for declining U.S. tight oil production in the coming months, and the growing risk of unplanned supply outages in the Middle East and North Africa.

- EIA forecasts that Brent crude oil prices will average $61/b in 2015 and $70/b in 2016, $1/b higher and $5/b lower than in last month’s STEO, respectively. Average WTI prices in 2015 and 2016 are expected to be $6/b and $5/b below Brent, respectively. The current values of futures and options contracts for December 2015 delivery suggest (Market Prices and Uncertainty Report) the market’s expectations (at the 95% confidence interval) for WTI prices in that month range from $41/b to $97/b.

- While U.S. monthly average regular gasoline retail prices in April were almost unchanged from March at $2.47/gallon (gal), U.S. weekly regular gasoline retail prices reached an average of $2.69/gal on May 11, reflecting rising crude oil prices and several outages at West Coast refineries. EIA expects U.S. regular gasoline retail prices, which averaged $3.36/gal in 2014, to average $2.43/gal in 2015 and $2.63/gal in 2016. The average household is expected to spend $675 less for gasoline in 2015 compared with last year because of lower prices.

- Total U.S. crude oil production averaged an estimated 9.3 million barrels per day (b/d) in March, but it is expected to decline from June through September before growth resumes. Given EIA’s price forecast, projected total crude oil production averages 9.2 million b/d in both 2015 and 2016, 40,000 b/d (0.5%) and 100,000 b/d (1.1%) lower than in last month’s STEO, respectively.

- Natural gas working inventories were 1,786 billion cubic feet (Bcf) on May 1, which was 71% higher than a year earlier, but 4% lower than the previous five-year (2010-14) average. The winter withdrawal season typically ends in March, and April is typically the beginning of the injection season, which runs through October. EIA projects natural gas inventories will end October 2015 at 3,890 Bcf, a net injection of 2,420 Bcf. This would be the second-highest injection season on record.
• Low natural gas prices in recent months have significantly increased the use of natural gas rather than coal for electricity generation. EIA expects natural gas generation in April and May will almost reach the level of coal generation, resulting in the closest convergence in generation shares between the two fuels since April 2012.

Global Petroleum and Other Liquids

As in last month’s STEO, global liquids production continues to exceed demand, resulting in inventory builds. Global oil inventory builds are projected to average 1.8 million b/d through the first half of 2015. Inventory builds moderate to 0.9 million b/d during the second half of the year, as demand rises and non-Organization of the Petroleum Exporting Countries (OPEC) supply growth slows, particularly in the United States. The expected inventory builds in 2015 are on top of an estimated average 1.1 million b/d increase in 2014.

Global Petroleum and Other Liquids Consumption. EIA estimates that global consumption of petroleum and other liquids grew by 0.9 million b/d in 2014, averaging 92.0 million b/d for the year. EIA expects global consumption will grow by 1.2 million b/d in 2015 and by 1.3 million b/d in 2016. Forecast global consumption growth was revised upward from last month’s STEO by an average of 0.2 million b/d in both 2015 and 2016, as lower oil prices stimulate demand growth more than previously expected. Projected global oil-consumption-weighted real gross domestic product (GDP), which increased by an estimated 2.7% in 2014, is projected to grow by 2.5% in 2015 and by 3.0% in 2016.

Consumption outside of the Organization for Economic Cooperation and Development (OECD) countries, which grew by 1.2 million b/d in 2014, is projected to grow by 0.9 million b/d in 2015 and by 1.2 million b/d in 2016. Lower forecast non-OECD consumption growth in 2015 mostly reflects a 0.2 million b/d decline in Russia’s consumption as a result of its economic downturn. Russia’s oil consumption is expected to decline by a similar amount in 2016, although it is offset by growth elsewhere. China’s economic growth slowed in the second half of 2014 and in the beginning of 2015. Nonetheless, China remains the main source of non-OECD oil consumption growth, with a projected annual average increase of 0.3 million b/d in both 2015 and 2016, down from growth of 0.4 million b/d in 2014.

OECD petroleum and other liquids consumption, which fell by 0.4 million b/d in 2014, is expected to grow by 0.3 million b/d in 2015 and by 0.1 million b/d in 2016. Japan and Europe accounted for nearly all of the 2014 decline in OECD oil consumption. Japan’s consumption is expected to continue declining over the next two years, albeit at a slower rate than in 2014, while Europe’s consumption is expected to stay relatively flat. The United States is the leading contributor to projected OECD consumption growth, with U.S. consumption increasing by 0.3 million b/d in 2015 and by 0.1 million b/d in 2016.

Non-OPEC Petroleum and Other Liquids Supply. EIA estimates that non-OPEC production grew by 2.2 million b/d in 2014. EIA expects non-OPEC production to grow by 0.8 million b/d in 2015 and by 0.4 million b/d in 2016. The slower growth in total non-OPEC supply is largely attributable to slower production growth in the United States and Canada in response to lower
projected oil prices, as well as declining production in Europe and Eurasia. After remaining relatively flat in 2015, production in Eurasia is projected to decline by more than 0.1 million b/d in 2016. The projected decline reflects reduced investment in Russia’s oil sector stemming from low oil prices and international sanctions.

Unplanned supply disruptions among non-OPEC producers averaged about 0.7 million b/d in April 2015, almost 0.1 million b/d higher than the previous month because of more outages in Yemen and a new outage in Gabon. Yemen’s production, which averaged 130,000 b/d in 2014, was halved when operations at an oil port and refinery were halted following the recent escalation in violence. In Gabon, a labor strike at oil fields resulted in a small supply disruption in April. South Sudan, Syria, and Yemen accounted for 90% of total non-OPEC supply disruptions in April. EIA estimates unplanned non-OPEC supply disruptions averaged 0.6 million b/d in 2014.

**OPEC Petroleum and Other Liquids Supply.** EIA estimates OPEC crude oil production averaged 30.1 million b/d in 2014, unchanged from the previous year. Crude oil production declines in Libya, Angola, Algeria, and Kuwait offset production growth in Iraq and Iran. In EIA’s forecast, OPEC crude oil production rises by 0.4 million b/d in 2015 and falls by 0.2 million b/d in 2016. Forecast OPEC crude oil production was revised upward from last month’s STEO by 0.3 million b/d in 2015 and by 0.2 million b/d in 2016. Iraq is expected to be the largest contributor to OPEC production growth over the next two years.

On April 2, Iran and the five permanent members of the United Nations Security Council plus Germany (P5+1) reached a framework agreement to guide negotiations targeting a comprehensive agreement by June 30. A comprehensive agreement could result in the lifting of oil-related sanctions against Iran and a subsequent increase in Iran’s crude oil production and exports, although the potential timing and details of any suspension of sanctions are uncertain. EIA has not changed its short-term projection for Iranian crude oil production, which assumes that production will stay close to the current level.

Iran produced 3.6 million b/d of crude oil in late 2011, before the recent round of sanctions was enacted, forcing Iran to shut in a substantial portion of its production. Iran’s ability to bring back online previously shut-in volumes and increase exports depends on several factors, including the current condition of oil fields and infrastructure that were shut in, the pace of sanctions relief, and the ability of Iran to find buyers in the present market. If a comprehensive agreement is reached, EIA estimates that the re-entry of more Iranian barrels could result in a $5/b-$15/b lower baseline STEO price forecast for 2016 (see the analysis box on page 5 of the April 2015 STEO for further discussion).

OPEC noncrude liquids production, which averaged 6.3 million b/d in 2014, is expected to increase by 0.3 million b/d in 2015 and by 0.1 million b/d in 2016, led by production increases in Qatar, Iran, and Kuwait.

In April, unplanned crude oil supply disruptions among OPEC producers averaged 2.3 million b/d, almost 0.1 million b/d lower compared with the previous month. Unplanned OPEC crude
supply disruptions averaged 2.4 million b/d in 2014, 0.5 million b/d higher than in the previous year.

EIA expects OPEC surplus crude oil production capacity, which is concentrated in Saudi Arabia, to decrease to an average of 1.8 million b/d in 2015 and increase to 2.1 million b/d in 2016, after averaging 2.0 million b/d in 2014. Surplus capacity is typically an indication of market conditions, and surplus capacity below 2.5 million b/d is an indicator of a relatively tight market. However, the current and forecast levels of global inventory builds make the projected low surplus capacity level in 2015 less significant. Nonetheless, low surplus capacity heightens uncertainty about the market’s ability to counteract unforeseen supply outages, particularly in the current geopolitical climate with ongoing conflicts in or next to major oil producing countries in the Middle East and North Africa. These factors may be applying upward pressure on crude oil prices that could continue through the forecast.

OECD Petroleum Inventories. EIA estimates that OECD commercial oil inventories totaled 2.72 billion barrels at the end of 2014, the highest end-of-year level on record and equivalent to roughly 59 days of consumption. Projected OECD oil inventories rise to 2.91 billion barrels at the end of 2015 and then rise slightly to 2.93 billion barrels at the end of 2016.

Crude Oil Prices. North Sea Brent crude oil spot prices increased by $4/b in April to a monthly average of $60/b, which was the highest monthly average for Brent so far this year. Several factors put upward pressure on crude oil prices in April. These factors included indications that global oil demand growth is accelerating, evidence that U.S. tight oil production could decline in the coming months, and the growing risk of unplanned supply outages in the Middle East and North Africa. As of May 1, the number of rigs drilling for crude oil had fallen for 21 consecutive weeks and was more than 50% below its peak in October 2014. Brent crude oil prices increased despite growing global oil inventories, which built by more than 2 million b/d for the second consecutive month in April, compared with an average build of 0.8 million b/d in March and April of last year. Inventory builds are projected to moderate in the coming months.

The monthly average WTI crude oil spot price increased to an average of $54/b in April, up $7/b from March. While crude oil inventories at Cushing, Oklahoma increased in April, they fell by 0.5 million barrels during the week ending April 24, the first decline in 21 weeks, and were unchanged for the week ending May 1. Moderating Cushing inventory builds, along with expected declines in U.S. tight oil production and increasing U.S. refinery runs, have put upward pressure on the price of WTI crude oil.

EIA projects the Brent crude oil price will average $61/b in 2015, $1/b higher than in last month’s STEO, with prices rising from an average of $54/b in the first quarter to an average of $63/b for the remainder of the year. The Brent crude oil price is projected to average $70/b in 2016, $5/b lower than in last month’s STEO, reflecting an increase in forecast OPEC crude oil production in 2016. However, this price projection remains subject to the uncertainties surrounding the possible lifting of sanctions against Iran and other market events. WTI prices in 2015 and 2016 are expected to average $6/b and $5/b, respectively, below Brent.
The current values of futures and options contracts continue to suggest high uncertainty in the price outlook (Market Prices and Uncertainty Report). WTI futures contracts for August 2015 delivery traded during the five-day period ending May 7 averaged $61/b while implied volatility averaged 33%, establishing the lower and upper limits of the 95% confidence interval for the market’s expectations of monthly average WTI prices in August 2015 at $46/b and $81/b, respectively. The 95% confidence interval for market expectations widens over time, with lower and upper limits of $41/b and $97/b for prices in December 2015. Last year at this time, WTI for August 2014 delivery averaged $99/b, and implied volatility averaged 17%. The corresponding lower and upper limits of the 95% confidence interval were $85/b and $115/b.

Given the high level of uncertainty in oil markets, several factors could cause oil prices to deviate significantly from current projections. Among these factors is the potential lifting of sanctions against Iran if a comprehensive agreement is reached. The level of unplanned production outages could also vary from forecast levels for a wide range of producers, including OPEC members Libya, Iraq, Nigeria, and Venezuela. The degree to which non-OPEC supply growth is affected by lower oil prices will also affect market balances and prices.

Several OPEC and non-OPEC oil producers rely heavily on oil revenue to finance their national budgets. The decline in oil prices since mid-2014 has led some governments to curb spending, potentially leading to austerity programs and fuel subsidy cuts that could spark social unrest, leaving some countries vulnerable to supply disruptions if protesters target oil infrastructure. Potential new supply disruptions are always a major uncertainty in the world oil supply forecast.

U.S. Petroleum and Other Liquids

U.S. weekly regular gasoline retail prices reached a 2015 high of $2.69/gal on May 11, an increase of 28¢/gal from early April. Rising crude oil prices and a series of refinery outages in California have pushed gasoline prices higher in the past month. As a result of these outages, gasoline prices on the West Coast have increased by more than the U.S. average, with prices in Petroleum Administration for Defense District (PADD) 5 averaging $3.44/gal on May 11, an increase of 49¢/gal from the first week in April. In April, monthly average regional gasoline retail prices ranged from a low of $2.23/gal in PADD 3, the Gulf Coast region, to a high of $3.01/gal in PADD 5, along the West Coast.

With crude oil prices projected to be relatively flat in the coming months, the U.S. monthly average gasoline price is projected to reach $2.68/gal in May, then decline as refineries in California resolve outages and refineries in the rest of the country increase production of gasoline following the spring maintenance season. EIA projects regular gasoline retail prices to average $2.51/gal during the third quarter and $2.43/gal for the full year of 2015.

Liquid Fuels Consumption. Total U.S. liquid fuels consumption rose by an estimated 70,000 b/d (0.4%) in 2014. In 2015, total liquid fuels consumption is forecast to grow by 340,000 b/d (1.8%). EIA projects that in 2016, liquid fuels consumption growth will slow to 70,000 b/d (0.4%).
Motor gasoline consumption, which rose by 80,000 b/d in 2014, increases by a projected 120,000 b/d (1.4%) in 2015 as lower prices and employment growth outweigh increases in vehicle fleet efficiency. Gasoline consumption is forecast to fall by 50,000 b/d (0.6%) in 2016, driven by higher prices and a long-term trend toward more-efficient vehicles.

Consumption of distillate fuel, which includes diesel fuel and heating oil, is forecast to rise by 80,000 b/d (2.0%) in 2015 and by 60,000 b/d (1.5%) in 2016. This growth is driven by increasing manufacturing output and foreign trade. Additionally, some of the growth in distillate fuel consumption comes from the implementation of Annex VI to the International Convention for the Prevention of Pollution from Ships (MARPOL Annex VI), which will increase marine distillate use in U.S. waters because of provisions that displace the use of some residual fuel oil.

Hydrocarbon gas liquids (HGL) consumption, which fell by 100,000 b/d (4.0%) in 2014, is projected to increase by 120,000 b/d in 2015 and by 60,000 b/d in 2016, as new petrochemical plant capacity increases the use of HGL as a feedstock. In addition, new HGL export terminal capacity contributes to an increase in HGL net exports from an average of 560,000 b/d in 2014 to 1.0 million b/d in 2016. HGL consumption rises as additional natural gas processing and pipeline capacity make HGL supplies more accessible, with HGL production forecast to increase by 520,000 b/d (17%) between 2014 and 2016.

**Liquid Fuels Supply.** U.S. crude oil production is projected to increase from an average of 8.7 million b/d in 2014 to 9.2 million b/d in 2015 and remain flat in 2016. The 2015 and 2016 production forecasts are 40,000 b/d and 100,000 b/d lower than in last month’s STEO, respectively. The reduction in the crude oil production forecast reflects a reduced WTI price forecast for 2016 in this STEO and a sustained drop in rig counts beyond what EIA had initially expected. Oil-directed rigs declined to the lowest level in almost five years as of early May.

EIA expects onshore production to decline beginning in the second quarter of 2015 because of unattractive economic returns in some areas of both emerging and mature oil production regions. Reductions in 2015 capital expenditures, cash flows, and low-cost credit availability have encouraged companies to defer investment or redirect investment away from marginal exploration and research drilling to focus on core areas of major tight oil plays. Projected 2015 oil prices remain high enough to support continued development drilling activity in the core areas of the Bakken, Eagle Ford, Niobrara, and Permian basins. Companies with lower drilling and debt-service costs that operate on acreage in the sweet spots of these regions are expected to continue to drill highly productive wells in 2015.

EIA expects U.S. crude oil production to exceed 9.3 million b/d in the second quarter of 2015, then decline by 280,000 b/d through the first quarter of 2016. With forecast WTI crude oil prices rising to an average of $67/b in the second quarter of 2016, drilling activity is expected to increase again. Companies are expected to take advantage of lower costs for acreage leasing, drilling, and well-completion services, resulting in growing production beginning in the second quarter of 2016. However, the forecast remains particularly sensitive to actual prices available at the wellhead, drilling economics that vary across regions and operators, and whether additional
production from the completion of backlogged wells materializes. Projected production in the 
Federal offshore region rises during the forecast period, while production in Alaska falls. 
Production in these areas is less sensitive to short-term price movements than is onshore 
production in the Lower 48 states.

HGL production at natural gas processing plants, which reached a record high of 3.1 million b/d 
in October, is projected to average 3.2 million b/d in 2015 and 3.5 million b/d in 2016. EIA 
expects higher ethane recovery rates following planned increases in petrochemical plant 
feedstock demand, while export terminal expansions will allow higher quantities of domestically 
produced propane and butanes to reach the international market.

The growth in domestic crude oil and other liquids production has contributed to a significant 
decline in imports. The share of total U.S. liquid fuels consumption met by net imports fell from 
60% in 2005 to an estimated 26% in 2014. EIA expects the net import share to decline to 21% in 
2016, which would be the lowest level since 1969.

**Petroleum Product Prices.** Rising crude oil prices and several California refinery outages 
contributed to an increase in U.S. regular gasoline retail prices from a monthly average of 
$2.47/gal in April to $2.69/gal on May 11. The U.S. monthly average gasoline price is projected 
to reach $2.68/gal in May, and then decline as refineries in California resolve outages and 
refineries in the rest of the country increase production of gasoline following the spring 
maintenance season. EIA projects regular gasoline retail prices to average $2.51/gal during the 
third quarter of 2015.

The U.S. regular gasoline retail price, which averaged $3.36/gal in 2014, is projected to average 
$2.43/gal in 2015, 3¢/gal higher than in last month’s STEO, and $2.63/gal in 2016, which is 
10¢/gal lower than in last month’s STEO. The diesel fuel retail price, which averaged $3.83/gal in 
2014, is projected to fall to an average of $2.88/gal in 2015 and then rise to $3.12/gal in 2016.

As in the case of crude oil, the market’s expectation of uncertainty in monthly average gasoline 
prices is reflected in the pricing and implied volatility of futures and options contracts. New York 
Harbor RBOB futures contracts for August 2015 delivery traded over the five-day period ending 
May 7 averaged $2.00/gal. The probability that the RBOB futures price will exceed $2.35/gal 
consistent with a U.S. average regular gasoline retail price above $3.00/gal) in August 2015 is 
about 12%.

**Natural Gas**

Natural gas prices fell throughout April, before rising slightly in early May. Production and 
inventories remain abundant, which is expected to keep prices at relatively low levels in 2015. 
 Preliminary data indicate recent production has surpassed the December record. Storage 
injections were strong in April, and EIA expects working inventories in storage will end October 
at 3,890 Bcf, just above the five-year (2010-14) average. EIA’s Henry Hub natural gas price 
forecast averages $2.93/million British thermal units (MMBtu) in 2015 and $3.32/MMBtu in 
2016, 14¢/MMBtu and 13¢/MMBtu, respectively, lower than in last month’s STEO.
Natural Gas Consumption. EIA’s forecast of U.S. total natural gas consumption averages 76.9 Bcf per day (Bcf/d) in 2015 and 76.3 Bcf/d in 2016, compared with 73.5 Bcf/d in 2014. Consumption growth is largely driven by demand in the industrial and electric power sectors. EIA projects natural gas consumption in the power sector to grow by 12.9% in 2015 and then fall by 2.2% in 2016. Low natural gas prices support increased use of natural gas for electricity generation in 2015. Industrial sector consumption increases by 4.0% and by 2.7% in 2015 and 2016, respectively, as new industrial projects come online, particularly in the fertilizer and chemicals sectors, and as industrial consumers continue to take advantage of low natural gas prices. Consumption of natural gas in the residential and commercial sectors is projected to decline in 2015 and 2016.

Natural Gas Production and Trade. EIA expects that marketed natural gas production will increase by 4.5 Bcf/d (6.0%) and by 1.3 Bcf/d (1.7%) in 2015 and 2016, respectively, reflecting continuing production growth in the Lower 48 states, which more than offsets the long-term declining production in the Gulf of Mexico. Although EIA expects natural gas prices to remain low, EIA expects that increases in drilling efficiency and growth in oil production (albeit at a slower rate) will continue to support growing natural gas production in the forecast. Most growth is expected to come from the Marcellus shale, as a backlog of drilled wells are completed and new pipelines come online to deliver Marcellus gas to markets in the Northeast. Preliminary data indicate significant production growth in April and the beginning of May.

Increases in domestic natural gas production are expected to reduce demand for natural gas imports from Canada and to support growth in exports to Mexico. EIA expects exports to Mexico, particularly from the Eagle Ford shale in South Texas, to increase because of growing demand from Mexico’s electric power sector, coupled with flat Mexican natural gas production.

LNG imports have fallen over the past five years because higher prices in Europe and Asia are more attractive to LNG exporters than the relatively low prices in the United States. Forecast LNG gross imports average 0.2 Bcf/d in 2015 and 2016. EIA projects that LNG gross exports will increase from an average of 0.04 Bcf/d in 2014 to 0.79 Bcf/d in 2016.

Natural Gas Inventories. On May 1, natural gas working inventories totaled 1,786 Bcf, which was 742 Bcf (71%) above the level at the same time in 2014 and 67 Bcf (4%) below the previous five-year (2010-14) average for the week. So far during the refill season, injections have surpassed the five-year average injections by a wide margin. EIA projects end-of-October 2015 inventories will total 3,890 Bcf, 92 Bcf above the five-year average.

Natural Gas Prices. The Henry Hub natural gas spot price averaged $2.61/MMBtu in April, a decline of 22 cents/MMBtu from March. EIA expects monthly average spot prices to remain lower than $3/MMBtu through August, and lower than $4/MMBtu through the remainder of the forecast. The projected Henry Hub natural gas price averages $2.93/MMBtu in 2015 and $3.32/MMBtu in 2016, 14c/MMBtu and 13c/MMBtu, respectively, lower than in last month’s STEO.
Natural gas futures contracts for August 2015 delivery traded during the five-day period ending May 7 averaged $2.85/MMBtu. Current options and futures prices imply that market participants place the lower and upper bounds for the 95% confidence interval for August 2015 contracts at $1.98/MMBtu and $4.11/MMBtu, respectively. At this time last year, the natural gas futures contract for August 2014 delivery averaged $4.78/MMBtu and the corresponding lower and upper limits of the 95% confidence interval were $3.63/MMBtu and $6.31/MMBtu.

**Coal**

**Coal Consumption.** EIA expects a 6% decrease in coal consumption in the electric power sector in 2015, despite a 1% increase in total electric power generation. Lower natural gas prices are the main driver of the decline. Projected low natural gas prices will make it more economical to run natural gas-fired generating units at higher utilization rates even in regions of the country (Midwest, South) that typically rely more heavily on coal-fired generation. The retirements of coal power plants in response to the implementation of the Mercury and Air Toxics Standards also reduces coal demand in the power sector in 2015. The full effect of the coal plant retirements on capacity will be felt in 2016, but projected rising electricity demand and higher natural gas prices increase the use of the remaining coal-fired fleet, mitigating the effects of the retirements as projected coal consumption in the electric power sector increases by 1% next year.

**Coal Supply.** EIA estimates that U.S. coal production for 2014 totaled 997 million short tons (MMst), 13 MMst (1.3%) higher than in 2013. Lower demand for coal (domestic consumption and exports) contributes to a projected 7% (66 MMst) decline in 2015 production. EIA projects a decline in all coal-producing regions with the largest decline occurring in Appalachia (34 MMst, or 13%). Declines in the Interior and Western regions are projected to be 2% and 5%, respectively. Coal production growth is projected to be flat in 2016.

**Coal Trade.** Slower growth in world coal demand, lower international coal prices, and higher coal output in other coal-exporting countries have led to a two-year decline in U.S. coal exports. EIA projects coal exports will fall by 10 MMst, to 87 MMst, in 2015, and then increase by 2 MMst in 2016. U.S. coal imports, which increased by more than 2 MMst in 2014 to 11 MMst, are expected to remain near that level over the next two years.

**Coal Prices.** The annual average coal price to the electric power sector fell from $2.39/MMBtu in 2011 to an estimated $2.36/MMBtu in 2014. EIA expects the delivered coal price to average $2.31/MMBtu in 2015 and $2.32/MMBtu in 2016.

**Electricity**

Henry Hub natural gas prices below $3/MMBtu have led to a shift away from the use of coal and toward natural gas for fueling power generation. During the first two months of 2015, coal fueled 37.4% of total U.S. electricity generation, down from 43.0% during the same period in 2014. In contrast, natural gas generation accounted for 27.6% of total generation, up from
23.7% during the first two months of 2014. The January-February natural gas fuel share of total electricity generation has been higher only once, in 2012, when it averaged 27.9%.

**Electricity Consumption.** The National Oceanic and Atmospheric Administration projects warmer temperatures this summer than last year’s mild summer. U.S. cooling degree days during the summer months (April-September) of 2015 are projected to total about 6% more than the same period last year. Higher temperatures should lead to increased use of electricity for air conditioning. EIA forecasts U.S. retail sales of electricity to the residential sector will be 3,920 gigawatthours per day (GWh/d) during the summer of 2015, which is 2.9% higher than last summer. Higher residential consumption of electricity this summer is offset somewhat by a year-over-year decline in sales during the first quarter, leading to forecast 2015 annual growth in U.S. residential electricity sales of 0.5%. EIA expects U.S. retail sales of electricity to the commercial and industrial sectors to grow by 1.5% and 0.6%, respectively, during 2015.

**Electricity Generation.** Total U.S. generation of electricity is forecast to average about 11,340 GWh/d in 2015, which is 1.2% higher than total generation last year. The use of coal for power generation stays low by historical standards as the forecast natural gas price at Henry Hub remains below $3/MMBtu through August. Lower use of existing coal capacity, combined with some coal retirements and regular seasonal maintenance, reduce projected U.S. coal generation in April and May so that its share of total generation is only 1.2 percentage points higher than the natural gas generation share. This is the closest convergence in generation shares between the two fuels since April 2012. EIA forecasts coal’s share of U.S. total generation will be 35.8% in 2015, down from 38.7% in 2014. In contrast, the natural gas fuel share averages 30.7% this year, up from 27.4% in 2014.

**Electricity Retail Prices.** EIA expects continued growth in average U.S. residential electricity prices over the forecast period, but at a slower pace than last year. The forecast U.S. retail residential price increases by 1.6% in 2015 and by 1.8% in 2016. Industrial electricity prices, which are more responsive to changes in fuel costs, are expected to fall by 2.4% in 2015 and then rise by 1.2% in 2016.

**Renewables and Carbon Dioxide Emissions**

**Electricity and Heat Generation from Renewables.** EIA expects renewables used in the electric power sector will grow by 3.0% in 2015 as conventional hydropower generation decreases by 0.9%, while nonhydropower renewable power generation increases 6.8%. The 2015 decrease in hydropower generation occurs because the effects of the California drought are only partially offset by resources elsewhere. Generation from hydropower is expected to return to longer-term average levels with an increase of 4.0% in 2016. Total renewables consumption for electric power and heat generation decreases by 0.4% in 2015 but increases by 4.5% in 2016.

EIA expects continued growth in utility-scale solar power generation, which is projected to average 83 GWh/d in 2016. Despite this growth, utility-scale solar power averages only 0.7% of total U.S. electricity generation in 2016. Although solar growth has historically been concentrated in customer-sited distributed generation installations, EIA expects utility-scale
solar capacity will increase by 84% between the end of 2014 and the end of 2016, with about half of this new capacity being built in California. Other leading states include North Carolina, Nevada, Texas, and Utah, which, combined with California, account for about 90% of the projected utility-scale capacity additions for 2015 and 2016. According to current law, projects coming online after the end of next year will see a federal investment tax credit of 10%, well below the 30% investment tax credit available for projects that come online before the end of 2016. This impending decline in the tax credit provides a strong incentive for projects to enter service before the end of 2016.

Wind capacity, which grew by 8.1% in 2014, is forecast to increase by 13.0% in 2015 and by another 11.3% in 2016. Because wind is starting from a much larger base than solar, even though the growth rate is lower, the absolute increase in wind capacity is more than twice that of solar: 17 GW of wind compared with 8 GW of utility-scale solar between 2014 and 2016.

**Liquid Biofuels.** After ethanol production in December 2014 topped 1.0 million b/d for the first time, it is estimated to have fallen to an average of 927,000 b/d in April 2015. Ethanol production averaged 935,000 b/d in 2014, and EIA expects it to average 936,000 b/d in 2015 and 937,000 b/d in 2016. Biodiesel production averaged an estimated 81,000 b/d in 2014 and is forecast to average 81,000 b/d in 2015 and 84,000 b/d in 2016.

**Energy-Related Carbon Dioxide Emissions.** EIA estimates that emissions grew 1.0% in 2014 and are projected to remain flat over the forecast period. These forecasts are sensitive to both weather and economic assumptions.

**U.S. Economic Assumptions**

**Recent Economic Indicators.** The Bureau of Economic Analysis reported that real gross domestic product (GDP) grew at an annual rate of 0.2% in the first quarter of 2015. Personal consumption expenditures and private inventory investment contributed positively to this initial estimate, and they were partly offset by negative contributions from exports and nonresidential fixed investment.

EIA used the April 2015 version of the IHS macroeconomic model with EIA’s energy price forecasts as model inputs to develop the economic projections in the STEO.

**Production, Income, and Employment.** Forecast real GDP growth reaches 2.6% in 2015 and slows to 2.4% in 2016. Growth is expected to rise in 2015 because of increases in consumer purchases. However, a stronger dollar and lower demand from slower-growing economies are expected to reduce export growth and raise import growth. Real disposable income grows by 3.3% in 2015, above the 3.1% forecast last month, and by 2.0% in 2016. Total industrial production grows at 1.6% in 2015 and 2.5% in 2016. Projected growth in nonfarm employment averages 2.0% in 2015 and 1.2% in 2016.

**Expenditures.** Forecast private real fixed investment growth averages 4.6% and 7.1% in 2015 and 2016, respectively, led by equipment in 2015 and 2016 and by equipment and structures in
2016. Real consumption expenditures grow faster than real GDP in 2015 and 2016, at 3.1% and 2.6%, respectively. Durable goods expenditures drive consumption spending in both years. Export growth is 2.1% and 4.2% over the same two years, while import growth is 3.7% in 2015 and 7.1% in 2016. Total government expenditures rise 0.9% in 2015 and 0.4% in 2016.

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