2016

SUSTAINABLE ENERGY IN AMERICA
Factbook

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2016

SUSTAINABLE ENERGY IN AMERICA
Factbook

Understanding the U.S. Energy Transformation

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It is a new era for American energy. In 2015, increased use of sustainable energy set the stage for a U.S. triple play of carbon reductions, cost savings and economic growth.

The 2016 edition of the Sustainable Energy in America Factbook – produced for the Business Council for Sustainable Energy by Bloomberg New Energy Finance, provides up-to-date, accurate market information about the broad range of industries — energy efficiency, renewable energy and natural gas — that are contributing to the country's move towards cleaner energy production and more efficient energy usage.

THE SUSTAINABLE ENERGY TRANSFORMATION

The energy productivity of the U.S. economy has **INCREASED BY 13%** from 2007 to 2015, and **2.3%** since 2014.

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Infographic

Get the Facts

- American energy productivity has increased by 13% from 2007 to 2015.

- 2015 was a record year for natural gas production, consumption, flows to power generation and volumes into storage.

- Renewable energy is a prominent part (20%) of the U.S. 2015 capacity mix, with 221GW installed across the country, a 57% increase over 2008 levels.

- Total U.S. investment in clean energy topped $56 billion in 2015, the second highest level in the world.

- 2015 U.S. power sector carbon emissions fell to their lowest annual level since 1995.

Executive Summary

Industry Focus:	Energy Efficiency Natural Gas Renewable Energy	Quick Facts On:	Alternative Fuel Vehicles Biomass/ Waste-to-Energy Carbon Capture & Storage	Combined Heat & Power Fuel Cells Hydropower

State Spotlight

Learn about clean energy in the following states:

- Minnesota
- Nevada
- Pennsylvania
- Virginia
- See 2016 Factbook State & Regional Slides

Previous Factbook Editions

Download previous editions of the Factbook here.

2013

2014

2015

About the Factbook Partners
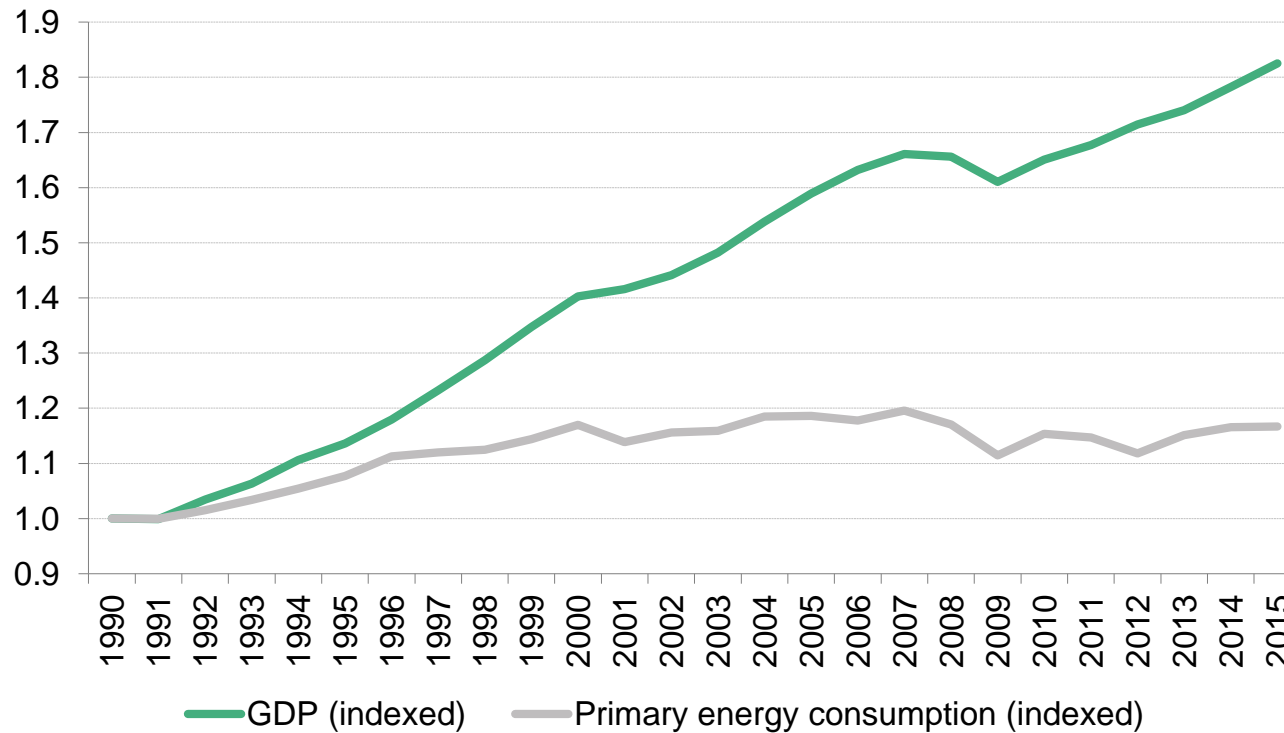

Bloomberg New Energy Finance (BNEF) provides unique analysis, tools and data for decision makers driving change in the energy system. With unrivalled depth and breadth, BNEF helps clients stay on top of developments across the energy spectrum from our comprehensive web-based platform.BNEF has 200 staff based in London, New York, Beijing, Cape Town, Hong Kong, Munich, New Delhi, San Francisco, São Paulo, Singapore, Sydney, Tokyo, Washington D.C., and Zurich.

The Business Council for Sustainable Energy (BCSE) is a coalition of companies and trade associations from the energy efficiency, natural gas and renewable energy sectors. The Council membership also includes independent electric power producers, investor-owned utilities, public power, commercial end-users and project developers and service providers for energy and environmental markets.

For more information please contact Laura Tierney of BCSE at 202-785-0507

Economy's energy productivity: GDP and primary energy consumption (indexed to 1990 levels)

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Legend: GDP (indexed) — Primary energy consumption (indexed)

- The US economy is increasingly energy productive, resulting in a decoupling between growth in GDP and growth in energy consumption. As US GDP expanded 83% over the last 25 years, energy consumption only ticked up 17%.
- By one measure (US GDP per unit of energy consumed), productivity has improved 56% since 1990, 13% since 2007, and 2.3% between 2014 and 2015.

Source: US Energy Information Administration (EIA), Bureau of Economic Analysis, Bloomberg Terminal

Notes: Values for 2015 energy consumption are projected, accounting for seasonality, based on latest monthly values from EIA (data available through September 2015). GDP is real and chained (2009 dollars); annual growth rate for GDP for 2015 is based on consensus of economic forecasts gathered on the Bloomberg Terminal as of January 2016.

US energy overview:
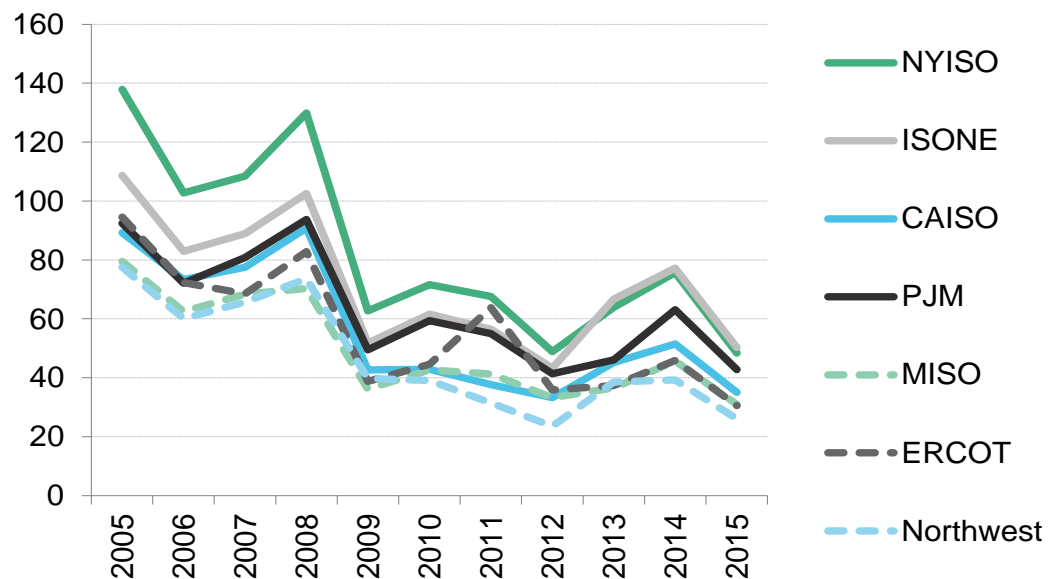# US electricity generation by fuel type (%)
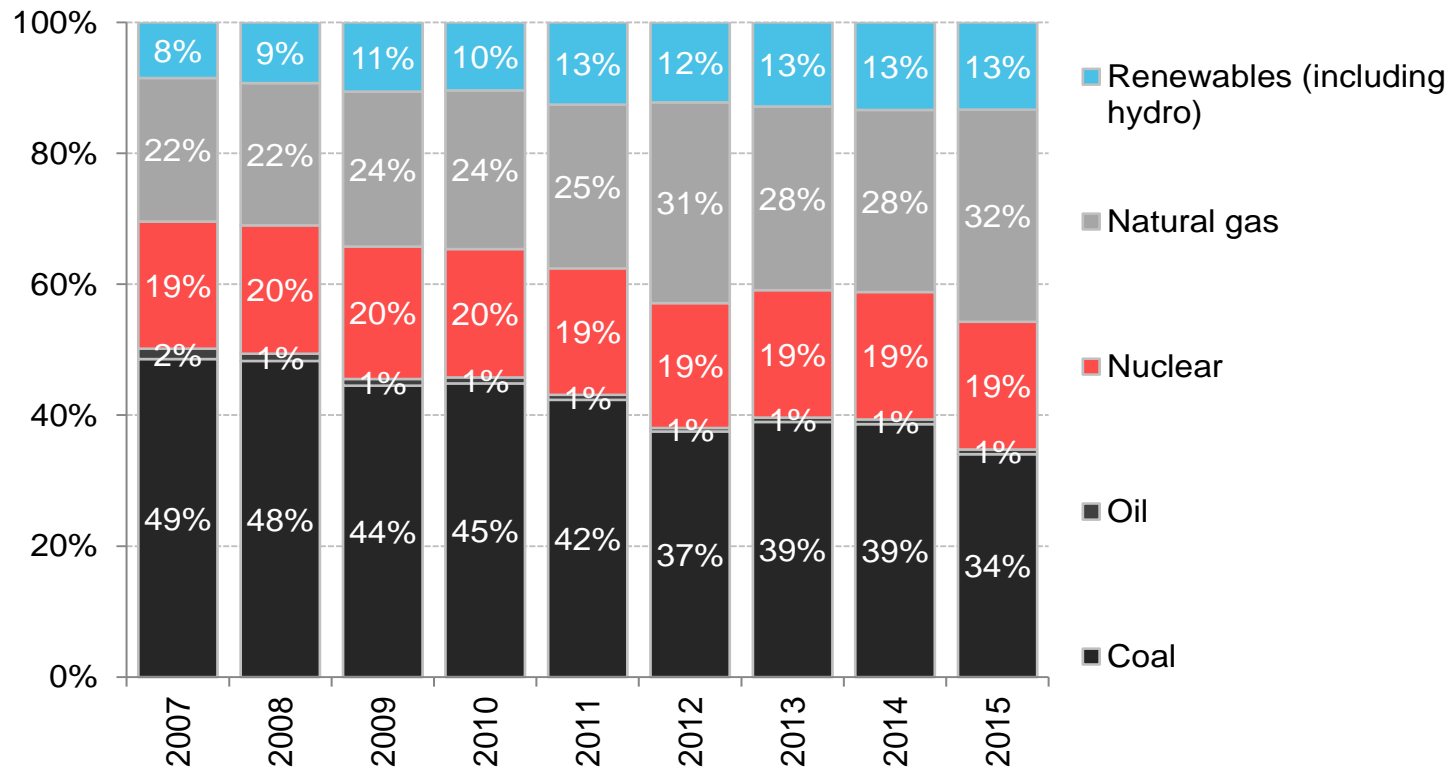
- Generation from natural gas plants increased by 17% from 2014 to 2015, while coal generation fell by 11%.
- The US power sector is gradually decarbonizing. From 2007 to 2015, natural gas increased from 22% to 32% of electricity generation, and renewables climbed from 8% to 13%. Coal's share slipped from 49% in 2007 to only 34% in 2015.
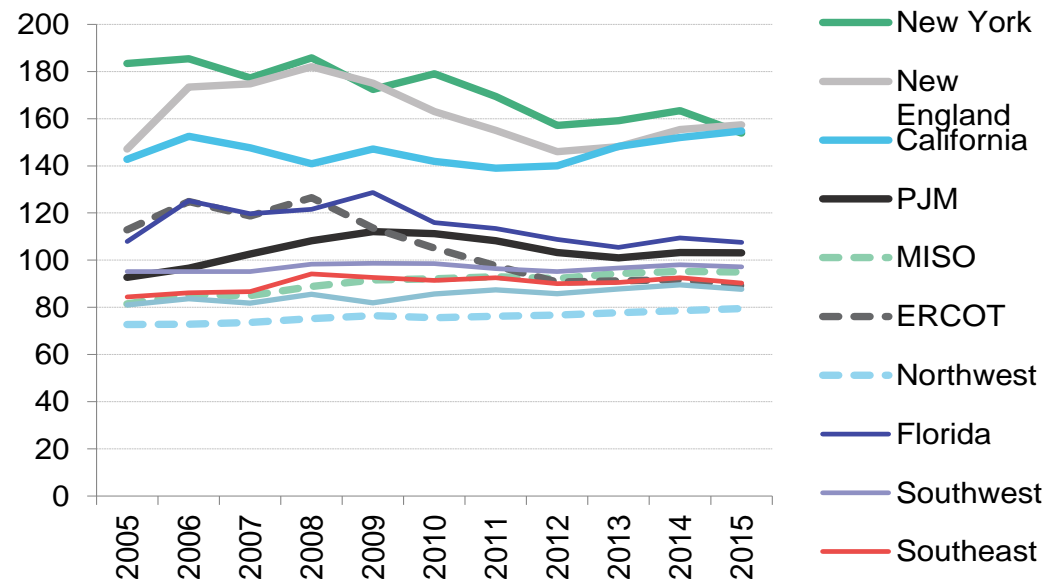
Source: EIA

Notes: Values for 2015 are projected, accounting for seasonality, based on latest monthly values from EIA (data available through October 2015). In chart at left, contribution from 'Other' is not shown; the amount is minimal and consists of miscellaneous technologies including hydrogen and non-renewable waste. The hydropower portion of 'Renewables' includes negative generation from pumped storage.

Wholesale power prices ($/MWh)

Legend: NYISO, ISONE, CAISO, PJM, MISO, ERCOT, Northwest

Average retail power prices ($/MWh)

Legend: New York, New England, California, PJM, MISO, ERCOT, Northwest, Florida, Southwest, Southeast
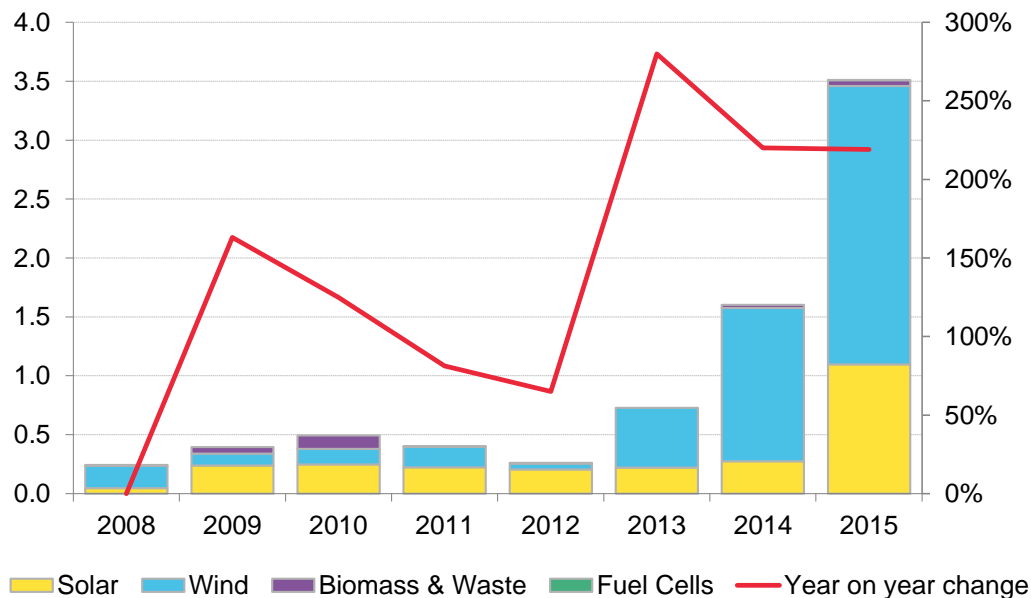
- Wholesale prices fell by about a third in 2015, as natural gas prices fell and more renewables connected to the grid.
- Retail power prices in most regions remain well below the peak prices seen in 2008-09.
- In 2015, retail electricity rates fell by 1.3% on average nationwide. New York (-5.8%) and Texas (-2.7%) saw the biggest year-on-year declines.
- Exceptions included California and New England where retail prices rose marginally (1.8% and 1.3%, respectively).

Source: Bloomberg New Energy Finance, EIA, Bloomberg Terminal Notes: Data through end-November 2015. Wholesale prices taken from proxy power hubs in each ISO. Prices are in real 2014 dollars.

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Renewable capacity contracted by corporations, by technology, 2008-15 (MW)

Legend: Solar | Wind | Biomass & Waste | Fuel Cells | Year on year change

Key players in corporate procurement

Retail: Target, IKEA, amazon.com, Walmart

Financial & Insurance: Kaiser Permanente, BNP PARIBAS, BARCLAYS

Tech: Google, Apple, facebook, Microsoft

Manu-facturing: P&G, GM, Volkswagen, Johnson & Johnson

- Corporate procurement of clean energy doubled in 2014 and again in 2015, breaching 3.5GW.
- Wind and solar are the energy technologies of choice. When procurement levels were low between 2008 and 2012, solar generally made up the majority of MW. After corporate procurement took off in 2013, however, wind has made up the dominant portion of procurement.
- Google has been the largest player to date, procuring 71MW of solar and 1.6GW of wind. Amazon is second, with 80MW of solar and 458MW of wind contracted in 2015 alone. Large individual projects include Facebook's 202MW purchasing power agreement (PPA) with Shannon Wind Farm in Texas, and Apple's 153MW PPA with First Solar.

Greenhouse gas emissions from the power sector (MtCO2e)

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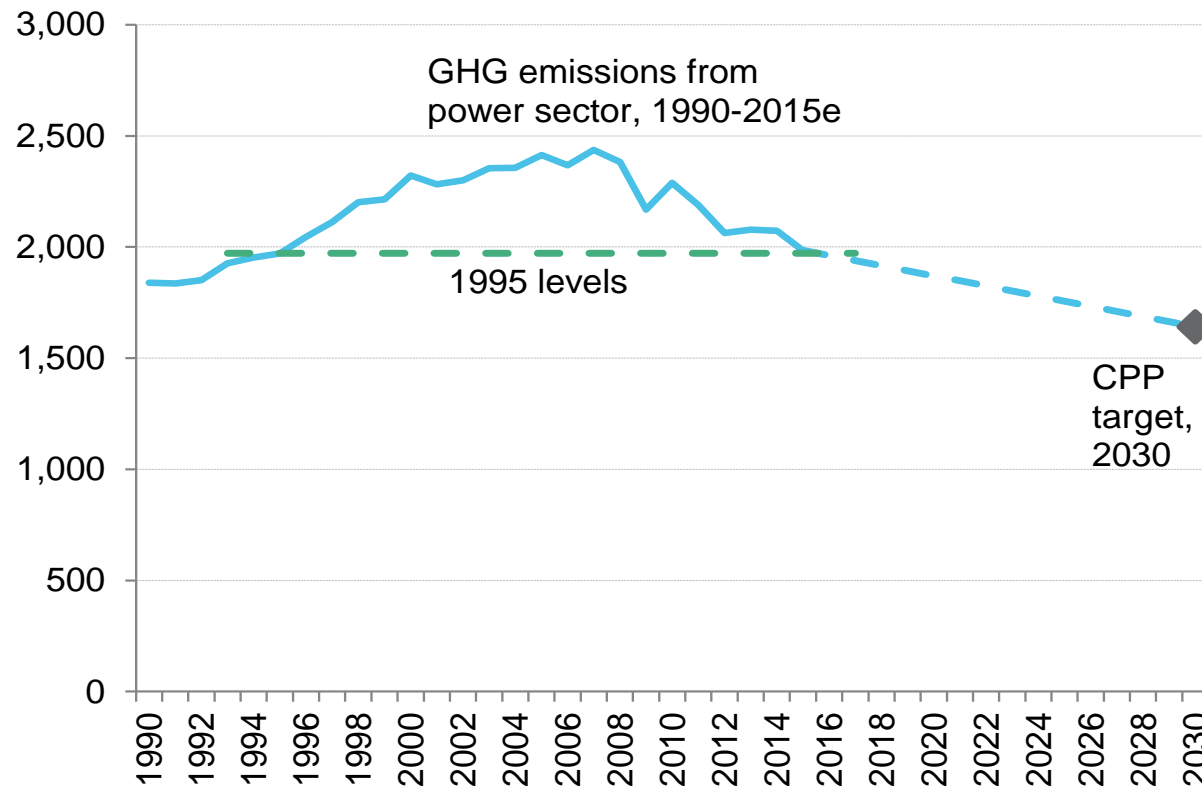
- In 2015, power-sector emissions sunk to their lowest levels (1,985Mt) since 1995 as cleaner-burning natural gas has displaced generation from coal-fired power plants.
- Emissions are 18% below 2005 levels.
- The Clean Power Plan targets a 32% cut from 2005 levels by 2030.

Source: Bloomberg New Energy Finance, EIA, EPA

Notes: Values for 2015 are projected, accounting for seasonality, based on latest monthly values from EIA (data available through September 2015).

Policy: US emissions pledge in Paris
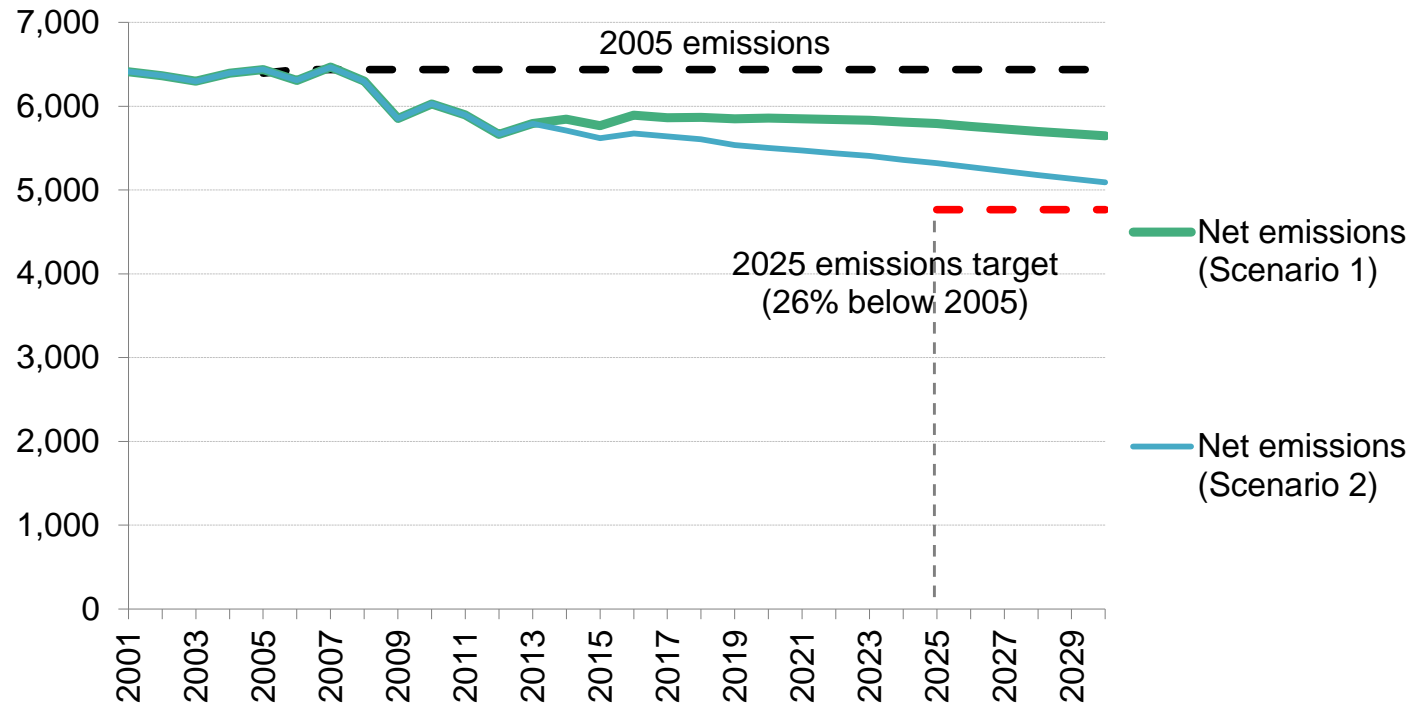
- On March 31, 2015, the US released its official pledge for US emissions cuts as part of the United Nations climate negotiations: to reduce emissions to 26-28% below 2005 levels by 2025. An earlier target proposed by President Obama set a 2020 goal of 17% below 2005 levels.
- In 2013, the last year with complete data, net emissions (ie, including sinks) stood 10% below 2005 levels.
- The new pledge builds off existing and coming programs (eg, CAFE standards, EPA Clean Power Plan), but more policy may be needed to achieve the targets.

Source: Bloomberg New Energy Finance, EIA, EPA, US Department of State   Notes: Net GHG emissions include total emissions less sequestration. Full data only available through 2013. Scenarios 1 and 2 show two trajectories for US emissions growth, based on a combination of Bloomberg New Energy Finance (BNEF) forecasts and EPA, EIA and US Department of State analyses. Both scenarios use BNEF's forecast for US power-sector emissions, assuming full compliance with the EPA Clean Power Plan. Both scenarios assume transportation growth as per the EIA's AEO2015 reference case and assuming existing CAFE standards. Scenario 1 assumes residential, commercial and industrial sectors' energy growth as per the EIA AEO2015 reference case; and agricultural, waste and forestry and land use sectors' growth as per the 2014 US Climate Action report. Scenario 2 assumes the historical decline rate for the residential and commercial sectors; assumes the industrial, agricultural and waste sectors' emissions level remain constant from 2013; and assumes forestry and land use emissions follow the "high sequestration case" in the 2014 US Climate Action report.