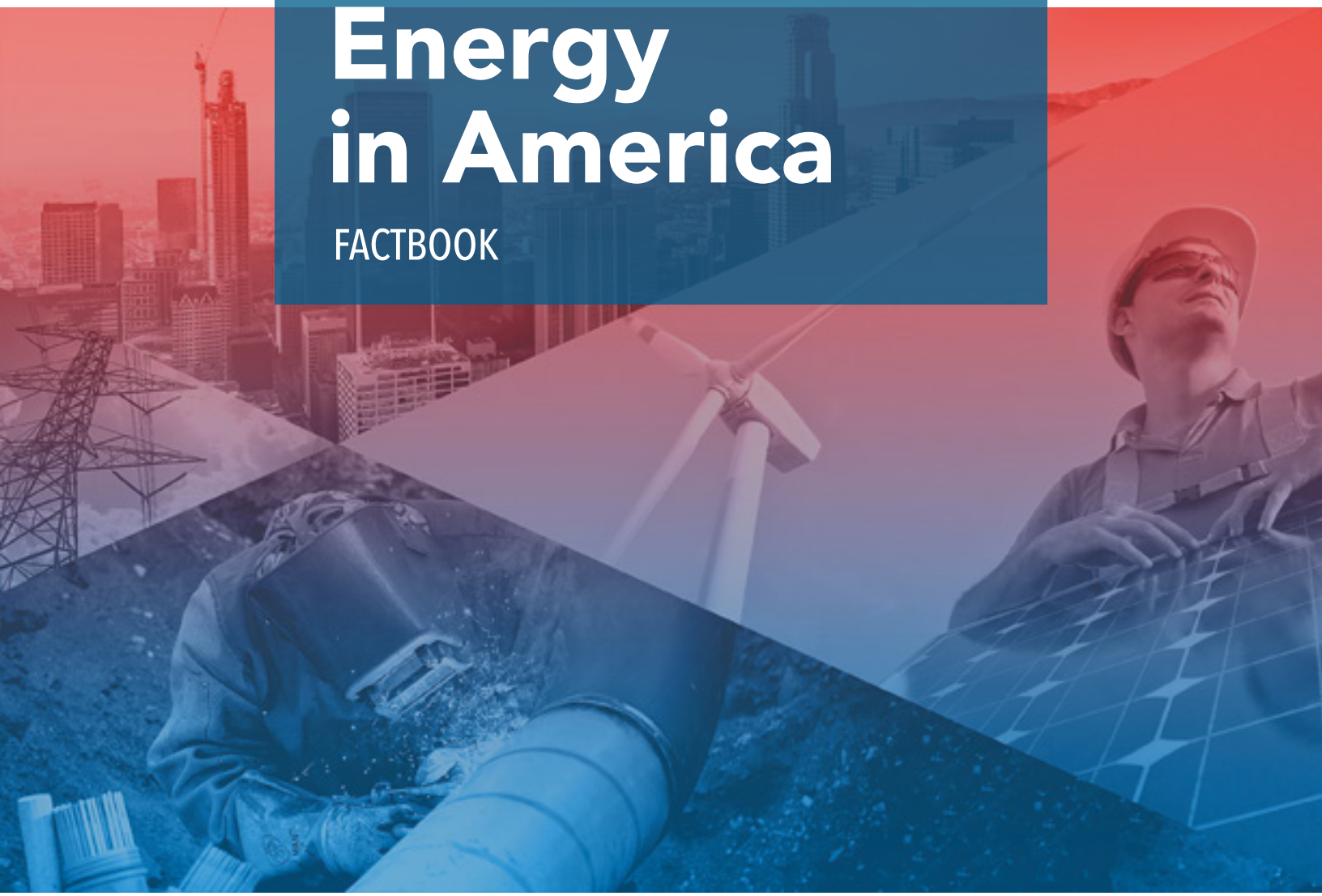
2017

Sustainable Energy in America

FACTBOOK



GROWTH SECTORS OF THE US ENERGY ECONOMY

- Energy Efficiency
- Natural Gas
- Renewable Energy

The Business Council for Sustainable Energy®

www.bcse.org

Supporting the U.S. Economy and Jobs With a Diverse Energy Mix

2016 marked yet another monumental year in the energy sector, as the transformation in how the U.S. produces and consumes energy continued.

The rapid pace of renewable energy deployment accelerated, consumption and export of domestic natural gas hit record levels, and the economy grew more energy-efficient than ever. **These shifts in the energy sector are advancing the U.S. economy and providing well-paying jobs for Americans.**

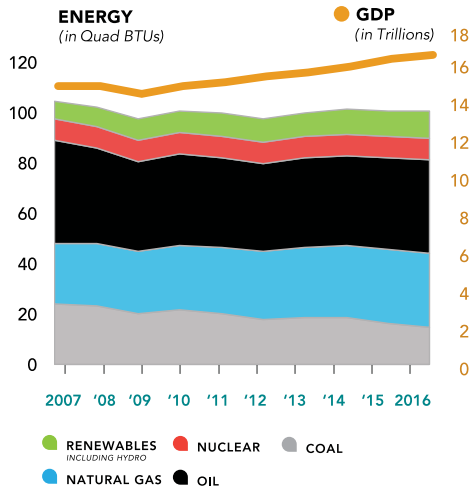
The Sustainable Energy in America Factbook provides up-to-date, accurate market information about the broad range of industries—energy efficiency, natural gas, and renewable energy—that are contributing to the country's move toward cleaner energy production and more-efficient energy usage.

Economic Growth & Energy Productivity On the Rise

Traditional energy sources are declining, while energy efficiency, natural gas, and renewable energy are playing a larger role. Utilities are ramping up investments in electricity and natural gas transmission, helping to create a more reliable energy system.

The U.S. economy is accomplishing more with less energy: GDP grew 12% since 2007, while total energy use fell 3.6%. In other words, the energy productivity of the U.S. economy—the ratio of U.S. GDP to energy consumed—grew 16%.

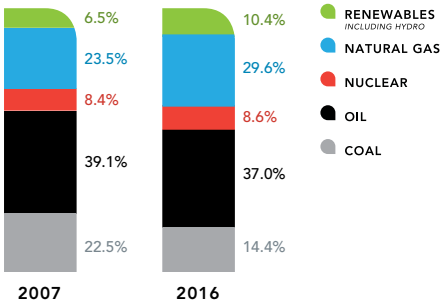
U.S. Primary Energy Consumption vs. GDP



Shifts in U.S. Energy Supply

As total energy demand has fallen 3.6% over the past 10 years, the use of natural gas and renewable energy has increased. In 2016, natural gas provided the U.S. with 29.6% of its total energy supply, and renewable energy, including hydropower, provided 10.4%.

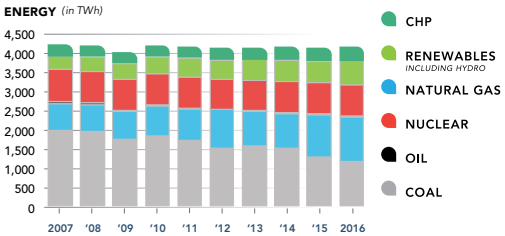
U.S. Primary Energy Supply by Fuel Type



Changes to U.S. Electricity Mix

Since 2007, the U.S. power sector has made large strides toward a decarbonized grid. Natural gas' share of electricity generation increased from 22% to 34%, and renewable energy's share climbed from 8% to 15%. Renewable energy and natural gas now account for roughly half of U.S. power generation.

U.S. Electricity Mix by Fuel Type



Source: EIA Monthly Energy Review, Bureau of Economic Analysis. Note: Values for 2016 energy consumption are projected, accounting for seasonality, based on latest monthly values from EIA (data available through October 2016). Electricity figures are projected based on EIA data through November 2016. GDP is real and chained (2009 dollars).

Consumers Are Dedicating a Smaller Share of Income to Energy

Americans are enjoying lower energy bills, spending less than 4% of household income on energy in 2016, the lowest percentage on record.

America Beats the Competition With Low Energy Prices

The U.S. is one of the most attractive markets in the world for companies whose operations entail significant energy-related costs. At **6.91 cents per kilowatt-hour,** the retail price of electricity for the industrial sector in the U.S. in 2015 was lower than that in other major economies, such as China, India, Mexico, and Japan.

Renewables and natural gas accounted for nearly 50% of all electricity generation in 2016, compared with 30% in 2007.

U.S. Attracts Substantial Clean Energy Investment

Looking at renewable energy and energy-smart technologies alone, investment in these sectors topped $59 billion in 2016 and $507 billion over the past decade. The U.S. finished the year as the second highest ranked country (after China) in total dollars attracted for new investment in these sectors.

Technology Snapshot

Energy Efficiency

- Electric utilities spent $6.3 billion and natural gas utilities spent $1.4 billion on energy efficiency programs in 2015.
- Local benchmarking and disclosure policies for energy use in buildings cover a total of 6.7 billion square feet (8%) of commercial floor space.
- Commercial Property Assessed Clean Energy (PACE) financing topped $45 million in Q3 2016, up 380% from Q3 2015 levels.
- Smart meters have been deployed to 44% of electricity consumers across the country.
- The fuel economy of vehicles has improved 12% since 2011, propelled by federal fuel efficiency standards.

Natural Gas

- Natural gas prices across all customer classes (residential, commercial, and industrial) approached record lows in 2016.
  - Prices for commercial consumers plunged to their lowest levels since 1977, in real terms.
- Natural gas is now the number one source of power in the U.S., contributing 34% of the electricity mix in 2016, up from only 22% in 2007.
- Since 2011, the U.S. has seen a 12% jump in total natural gas production and a 79% surge in shale gas extraction.

Renewable Energy

- Renewable energy is a prominent part (22%) of the U.S. power fleet, with 244 GW of installed capacity across the country, an 83% increase over 2007 levels.
- In real terms at the global level, the cost of constructing a utility-scale photovoltaic project dropped 57%, and the cost for wind turbines declined from $1.34 million per MW to $1.12 million per MW between 2011 and 2016.
- Hydropower provides 80 GW of U.S. renewable capacity (excluding pumped storage).
- Wind and solar capacity have increased over 600% since 2007 (from 16 GW to 123 GW).
- Biogas, biomass, geothermal, and waste-to-energy represent 18 GW of U.S. capacity. While these technologies provide renewable, round-the-clock power, they have lacked access to the same incentives as the fast-growing sectors.

JOBS IN THE U.S.

Clean energy industries support well-paying jobs in the United States.

Clean Energy and Carbon Reductions

The ascendancy of natural gas, influx of renewables, expansion of combined heat and power and other distributed power sources, adoption of demand-side efficiency technologies, and deployment of advanced vehicles are all contributing to a long-term decline in overall U.S. greenhouse gas emissions.

- Total greenhouse gas emissions in the U.S. plunged to a 25-year low in 2016, falling to an estimated 6.5 gigatonnes of carbon dioxide-equivalent.
- In 2016, U.S. power sector carbon emissions fell to 1.8 gigatonnes of carbon dioxide-equivalent, their lowest annual level since at least 1990 and 24% below 2005 levels.

Businesses Take Action on Renewables and Efficiency

Large American corporations—across many industry sectors—contracted for 2.5 GW of renewable energy capacity (wind and solar) by year-end 2016.

Companies are investing in energy efficiency too, using ISO 50001 as an energy management system and joining voluntary partnerships such as the Department of Energy's Better Plants program or pledging to double their energy productivity under the global EP100 initiative.

State Policies Driving Transition

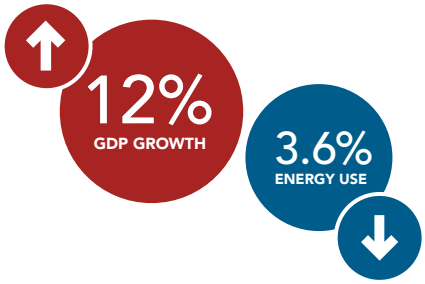
States continue to take a leading role in energy policy and planning. 2016 saw significant policy developments in Illinois, Michigan, New York, and Ohio that have the potential to increase clean energy deployment and create jobs in the energy efficiency, natural gas, and renewable energy sectors.

Energy Is Critical Infrastructure

The extensive power grid and natural gas system in the U.S. have fueled the nation's economic growth and ensured its global competitiveness. In 2016, electric transmission projects received an estimated $21.5 billion, nearly double the $11.9 billion invested in 2011. Total gas utility investment across transmission, storage, and distribution surged to $21.1 billion in 2015, up from an average of $16–17 billion over 2011–2014.

Infrastructure build-out to support alternative vehicles—electric (EV), hydrogen, and natural gas—accelerated in 2016. The total number of public EV charging outlets soared 29% nationwide, and California committed to build 100 hydrogen fueling stations by 2025. However, more investment is needed in certain areas of the country to bring clean energy and natural gas to consumers. For example, electricity transmission is needed to send clean power to regional demand centers, and new pipelines can ease capacity constraints and move natural gas from supply basins to demand centers, especially in the Northeast.

The U.S. economy is doing more with less energy, experiencing a 12% growth in GDP while total energy use fell 3.6% since 2007.



GET THE FACTS

To view the **Sustainable Energy in America 2017 Factbook**, visit the link below

www.bcse.org/
sustainableenergyfactbook.html

About the Sustainable Energy in America Factbook

The Sustainable Energy in America Factbook was produced for the Business Council for Sustainable Energy (BCSE) by Bloomberg New Energy Finance (BNEF). BNEF compiled, wrote, and edited this report and retained editorial independence and responsibility for its content throughout the process. Visit about.bnef.com for more information. BCSE members and partners provided additional data sets, and the project was commissioned with contributions from the following sponsors:

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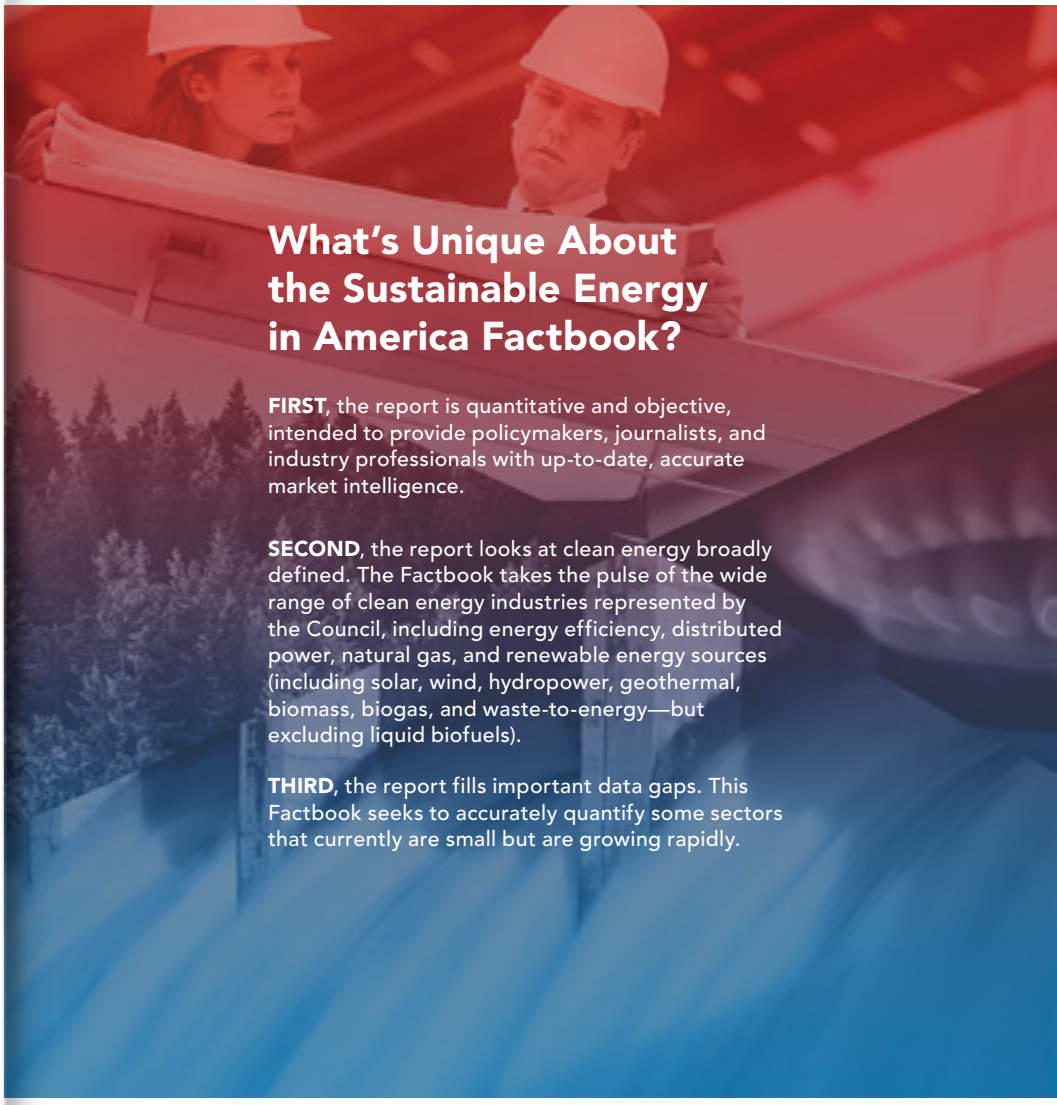

What's Unique About the Sustainable Energy in America Factbook?

FIRST, the report is quantitative and objective, intended to provide policymakers, journalists, and industry professionals with up-to-date, accurate market intelligence.

SECOND, the report looks at clean energy broadly defined. The Factbook takes the pulse of the wide range of clean energy industries represented by the Council, including energy efficiency, distributed power, natural gas, and renewable energy sources (including solar, wind, hydropower, geothermal, biomass, biogas, and waste-to-energy—but excluding liquid biofuels).

THIRD, the report fills important data gaps. This Factbook seeks to accurately quantify some sectors that currently are small but are growing rapidly.

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