2019

Sustainable Energy in America

FACTBOOK

Understanding the U.S. Energy Transformation

The Sustainable Energy in America Factbook provides up-to-date, accurate market information on the U.S. energy landscape. It includes an in-depth look at the energy efficiency, natural gas, and renewable energy sectors, and covers emerging technology areas such as carbon capture, utilization, and storage; sustainable transportation; and energy storage.

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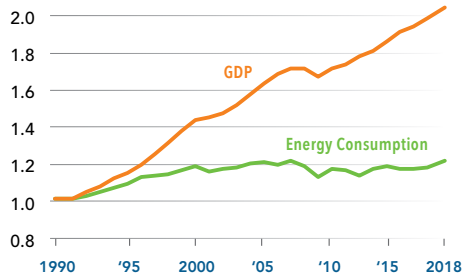
U.S. Clean Energy Trends in 2018

SUSTAINABLE ENERGY PROVIDES MAJORITY OF U.S. ELECTRICITY

U.S. ENERGY PRODUCTIVITY TRENDS

Over the past decade, America's gross domestic product (GDP) has climbed 22% while primary energy consumption has grown 7.5%. In other words, the energy productivity of the U.S. economy—the ratio of U.S. GDP to energy consumed—grew 14% since 2009. In 2018, in a potential departure from this trend, energy consumption grew 3.3%, outpacing the GDP growth rate of 2.9%, resulting in an energy productivity decline of 0.4%. This can be attributed in part to increased industrial activity and to extreme weather pressures on building heating and cooling demand.

U.S. PRIMARY ENERGY CONSUMPTION AND GDP

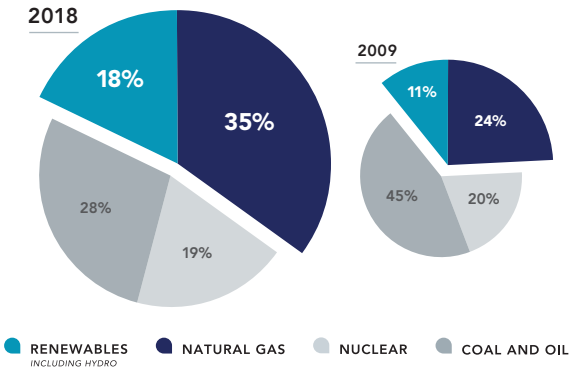


Indexed to 1990 levels

U.S. ELECTRICITY MIX

Since 2009, the U.S. power sector has made large strides toward a decarbonized grid. In the last decade, natural gas' share of electricity generation increased from 24% to 35% and renewable energy's share climbed from 11% to 18%. Of note, combined heat and power (CHP) contributed 8.5% of power generation in 2018.

CLEAN ENERGY SECTOR EXPANDS



CONSUMERS ARE DEDICATING A SMALLER SHARE OF SPENDING TO ENERGY COSTS

Consumers dedicated a record low share of their household spending to electricity (1.3%) and natural gas (0.4%). The total share of household spending dedicated to energy costs was 4.2%, a near-record low.

U.S. ATTRACTS SUBSTANTIAL CLEAN ENERGY INVESTMENT

New investment in renewable energy and energy-smart technologies in the U.S. topped $64 billion in 2018—19.3% of the global total—and totaled $530 billion over the past decade. The U.S. finished the year as the second-highest-ranked country (after China) in total new investment dollars.

AMERICA BEATS THE COMPETITION WITH LOW ENERGY PRICES

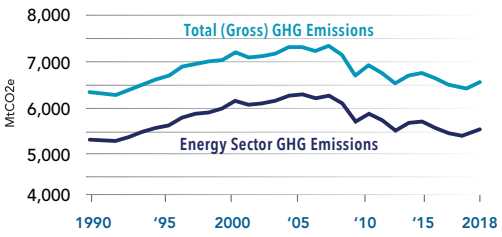
The U.S. is one of the most attractive markets in the world for companies whose operations entail significant energy-related costs. At 6.88¢ per kilowatt-hour, the retail price of electricity for the industrial sector in the U.S. in 2017 was lower than that in other major economies, such as China, Japan, and Mexico.

Natural gas and renewable energy accounted for 53% of all electricity generation in 2018, up from 35% in 2009.

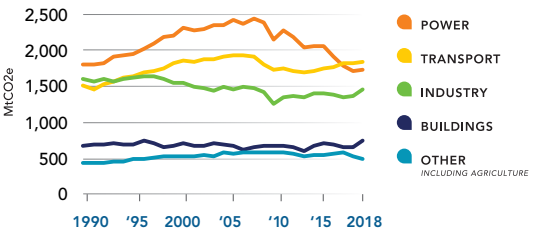
U.S. GREENHOUSE GAS EMISSIONS

Total U.S. greenhouse gas (GHG) emissions rose for the first time in several years—increasing by a projected 2.5%—as energy demand increased in the buildings and industrial sectors and, to a lesser extent, in the power and transport sectors. A cleaner electricity mix kept the increase in power sector emissions to 0.6%. Total U.S. GHG emissions now sit at roughly 10% below 2005 levels.

ECONOMY-WIDE & ENERGY SECTOR EMISSIONS



EMISSIONS BY SECTOR



Metric tons of carbon dioxide equivalent (MtCO2e)

For source information of above graphs, please see the 2019 Sustainable Energy in America Factbook pages 15 (GDP and energy consumption), 18 (electricity mix), and 23 (emissions).

GET THE FACTS

INDUSTRY HIGHLIGHTS

Energy Efficiency

- Connecticut, Florida, Pennsylvania, and Virginia strengthened their state building energy codes in 2018.
- Total U.S. spending on energy efficiency through formal frameworks—such as utilities, ESPCs, and PACE—climbed to a record $15 billion in 2017.
- Local benchmarking and disclosure policies for energy use in buildings jumped from 9% to 13% of commercial floor space in 2017.
- 57% of U.S. electricity customers have a smart meter.
- Over 14 million households now have a smart thermostat.
- The fuel economy of vehicles has improved 3% since 2012 and 22% over the past decade, propelled by federal fuel efficiency standards.

Natural Gas

- Natural gas is the number one source of power in the U.S., contributing 35% of the electricity mix in 2018, equivalent to nearly 1,500 terrawatt-hours, a 14% jump from 2017.
- Total natural gas demand has grown 40% over the past decade and spiked 13% from 2017 to 2018 to hit a new record of 83.1 billion cubic feet per day.
- Natural gas prices for retail customers in 2018, adjusted for inflation, were among the lowest in decades, according to the American Gas Association.
- There were 2,240 operational biogas systems in the U.S. in 2018, with 32 MW of farm-based systems and $316 million of new investment in biogas systems that year.

Renewable Energy

- Renewable generation output grew 5% year-on-year in 2018, accounting for 18% of total U.S. generation—a 79% increase from its contribution a decade ago.
- Renewable energy added a record 19.5 gigawatts (GW) of new capacity in 2018, the second highest year on record.
- Hydropower was the largest source of zero-carbon, renewable generation in 2018.
- Wind and solar capacity has more than quadrupled since 2009 (from 36.2 GW to 164.6 GW in 2018).
- Biogas, biomass, geothermal, and waste-to-energy represented 16.5 GW of U.S. capacity in 2018. While these technologies can provide renewable, around-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 over 3 million jobs in the United States.

Sustainable Transportation

- In 2018, U.S. sales of electric vehicles (EVs) increased 80%, putting over 350,000 EVs on the road. The number of public charging sites grew 28%.
- Lithium-ion battery prices dropped another 18% in 2018, boosting both EVs and stationary storage applications.
- Since 2008, natural gas used in vehicles has experienced a 5.3% compounded annual growth rate.
- Fuel cell vehicle (FCV) sales hit a record 2,368 in 2018, increasing the number of FCVs on the road by 67% to a total of 5,899.

MODERN AND RESILIENT INFRASTRUCTURE

The extensive power grid and natural gas system in the U.S. is fueling the nation's economic growth and is supporting its global competitiveness. Clean energy technologies in the energy, buildings, and transport sectors are also helping to ensure that the U.S. has modern and resilient infrastructure.

Investor-owned utilities and independent transmission developers spent an estimated $21.9 billion on transmission in 2017, a 6% increase over 2016 and an 83% increase since 2011. Investment in midstream gas infrastructure—transmission, distribution, and storage—climbed to $27.5 billion in 2017, a 9.4% increase from 2016.

More investment is needed in certain areas of the country to bring clean energy and natural gas to customers. Additional electric transmission is needed to send clean power to regional demand centers. New pipelines can ease capacity constraints and move natural gas from supply basins to demand centers, especially in the Northeast.

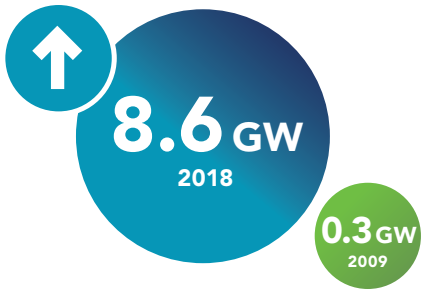
LEADING THE ACTION

BUSINESSES, CITIES, AND STATES

Large U.S. corporations, across many industry sectors, contracted for a new record high of 8.6 GW of renewable energy capacity by year-end 2018. Companies also are investing in energy efficiency, pledging to double their energy productivity under the global EP100 initiative. Cities and states are reaffirming their commitments to clean energy and climate change by adopting new policies and forming new partnerships to enhance ambition to reduce emissions and improve resilience.

Corporations Drive Demand

NEW POWER PURCHASE AGREEMENTS FOR RENEWABLE ENERGY



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