

2018 Sustainable Energy in America Factbook

GROWTH SECTORS OF THE U.S. ENERGY ECONOMY

 Energy Efficiency

 Natural Gas

 Renewable Energy

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The 2018 edition of the Sustainable Energy in America Factbook is sponsored by:



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About the Factbook: What is it, and what's new?

What is it?

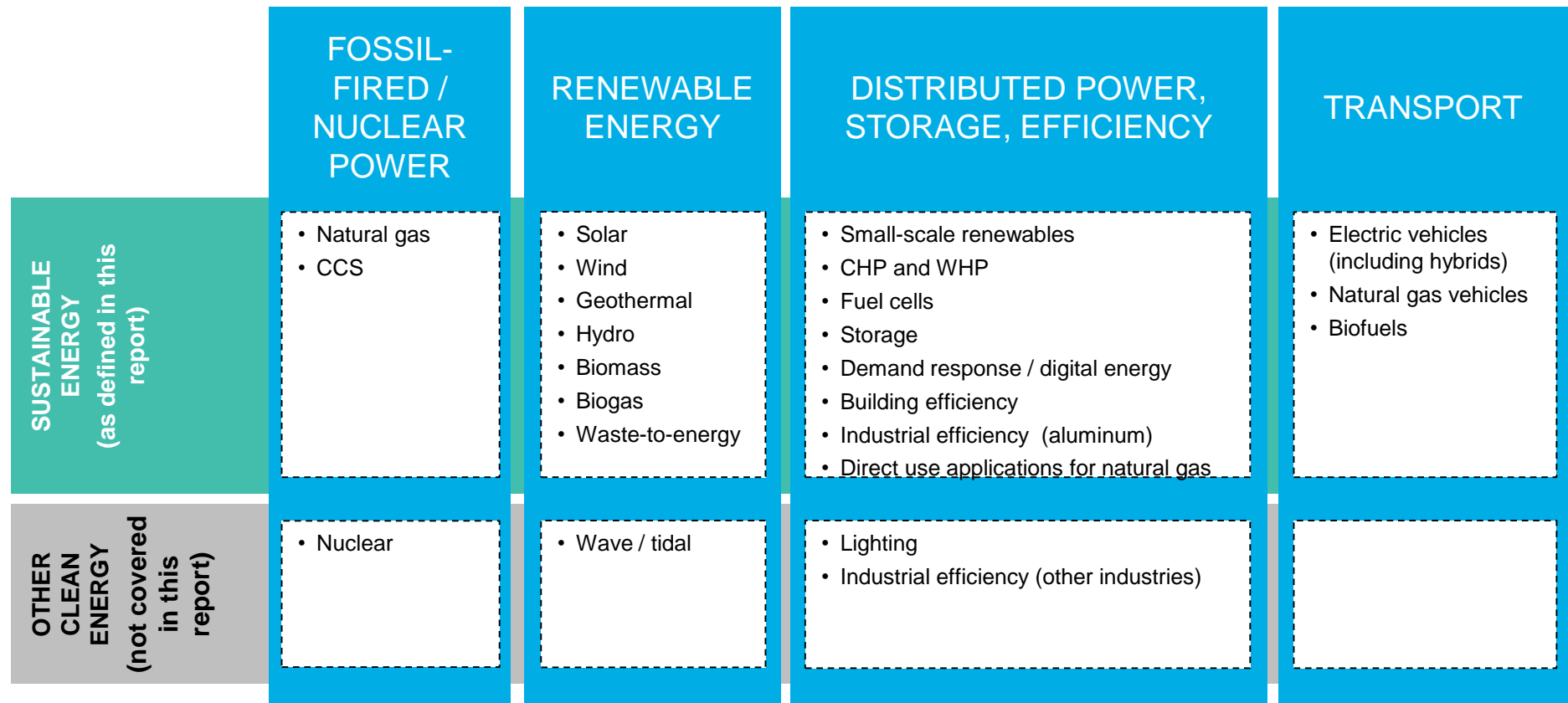
- Aims to **augment** existing, reputable sources of information on U.S. energy
- Focuses on **renewables, efficiency, and natural gas**
- **Fills important data gaps** in certain areas (e.g., clean energy investment flows, contribution of distributed energy)
- Contains data through the end of 2017 wherever possible
- Employs **Bloomberg New Energy Finance data** in most cases, augmented by EIA, FERC, ACEEE, LBNL, and other sources where necessary
- Contains the very **latest information on new energy technology costs**
- Has been graciously underwritten by the **Business Council for Sustainable Energy**
- Is in its **sixth edition** (first published in January 2013)

What's new?

- **New coverage:** This report contains data shown for the first time in the Factbook series, including jobs produced by the sustainable energy sector, utility smart thermostat programs, and net metering developments.
- **Updated analysis:** Most charts have been extended by one year to capture the latest data.
- **2017 developments:** The text in the slides highlights major changes that occurred over the past year.
- **Format:** This year's edition of the Factbook (this document) consists of Powerpoint slides showing updated charts. For those looking for more context on any sector, the 2014 edition⁽¹⁾ can continue to serve as a reference. The emphasis of this 2018 edition is to capture new developments that occurred in the past year.

Notes: (1) The 2014 Factbook can be found at <http://www.bcse.org/factbook/pdfs/2014%20Sustainable%20Energy%20in%20America%20Factbook.pdf>

About the Factbook: Understanding terminology for this report



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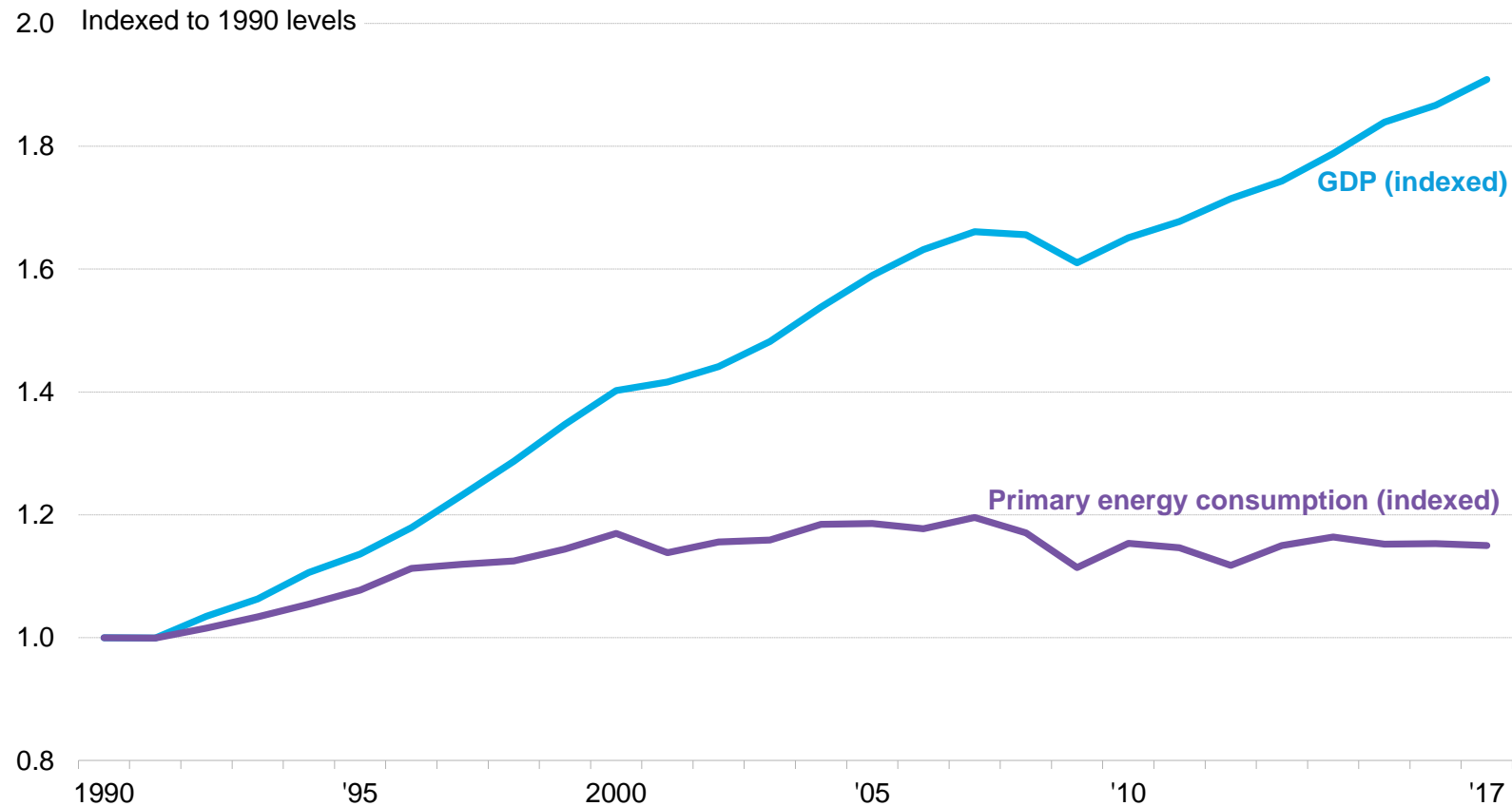
1. Economic growth no longer relies on expanding energy consumption
2. Sustainable energy has become an established part of U.S. power
3. The power sector transformation is not ratcheting up consumer costs
4. Although *federal* policy support for clean energy has faltered, others are taking the lead

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U.S. economic growth no longer relies on expanding energy consumption

U.S. GDP and primary energy consumption



In the past 10 years:

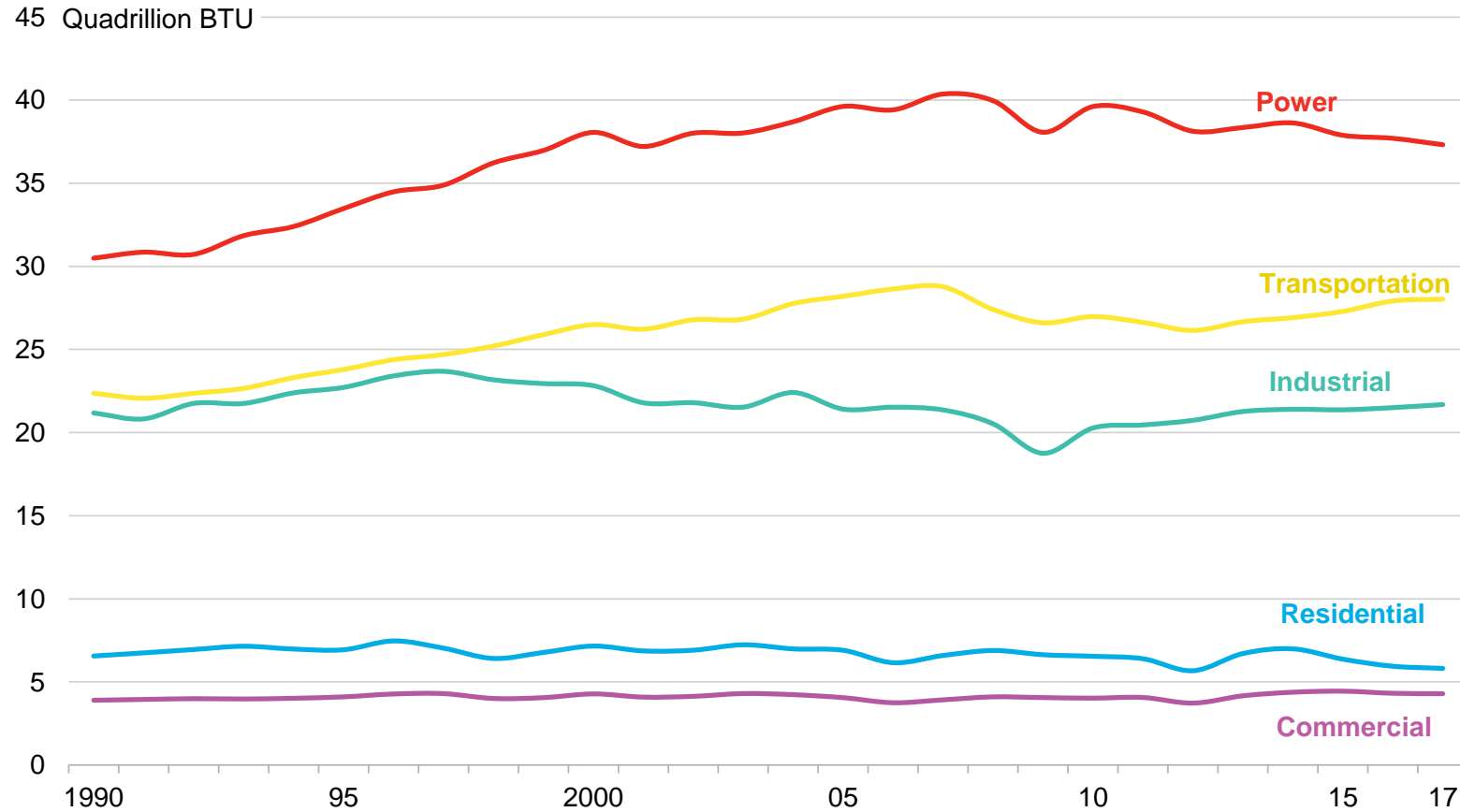
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↓ -2%

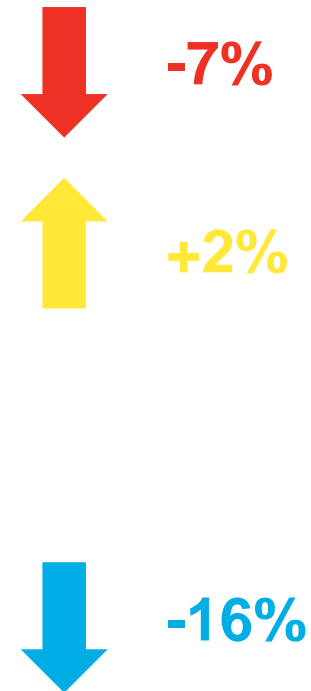
Source: Bureau of Economic Analysis, Lawrence Berkeley National Laboratory, BNEF. Notes: Values for 2017 are projected, accounting for seasonality, based on latest monthly values from EIA (data available through October 2017). 2017 GDP estimate is a projection from economists compiled at ECFC <GO> on the Bloomberg Terminal.

Energy use shrinks in the power sector, rises in transportation

U.S. primary energy consumption by sector



In the past 10 years:



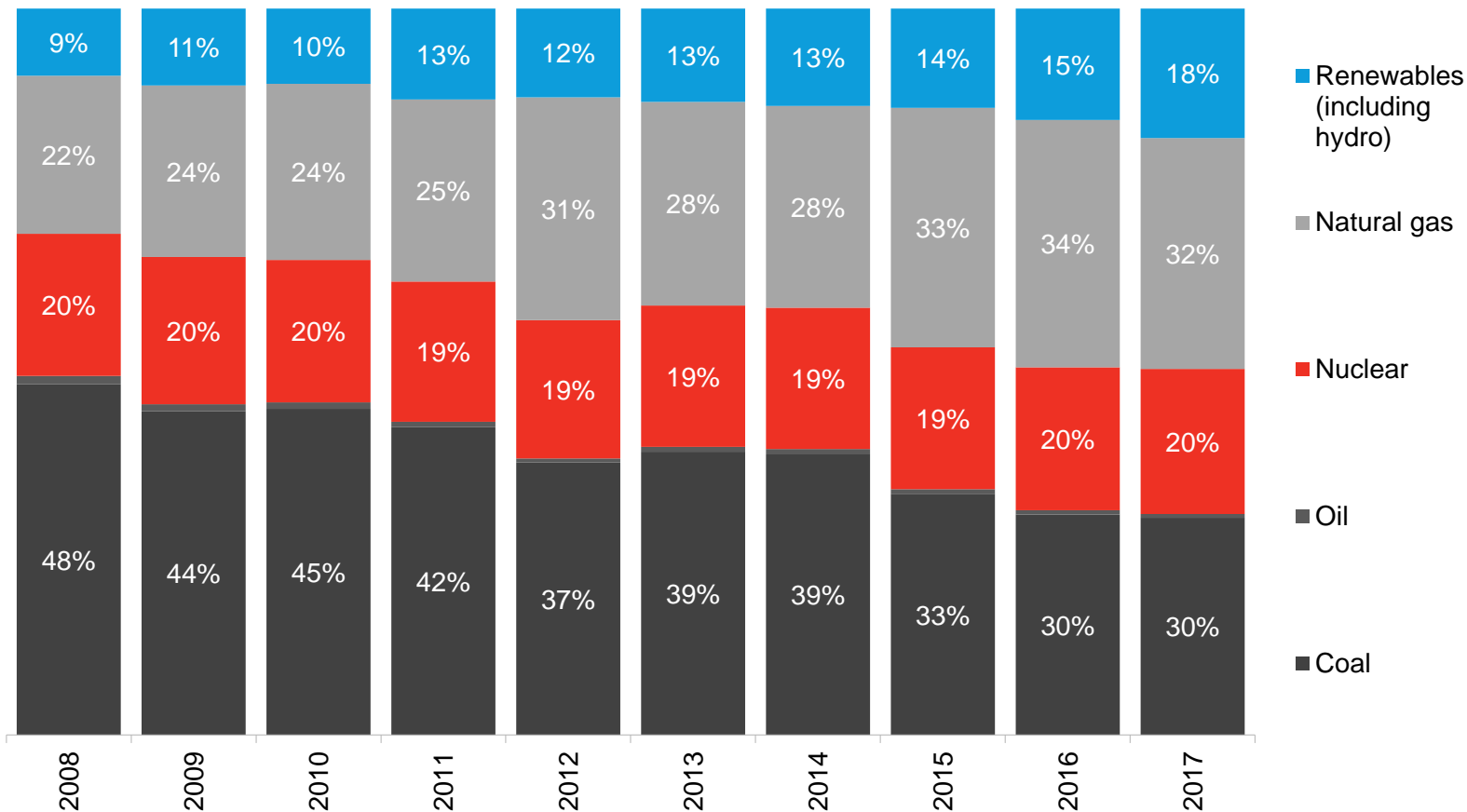
Source: EIA, BNEF Notes: Values for 2017 are projected, accounting for seasonality, based on latest monthly values from EIA (data available through October 2017).

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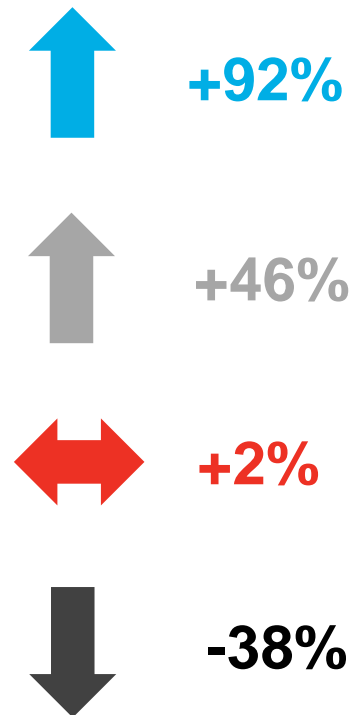
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Sustainable energy resources have become an established part of U.S. power

U.S. electricity generation by fuel type (% of total generation)



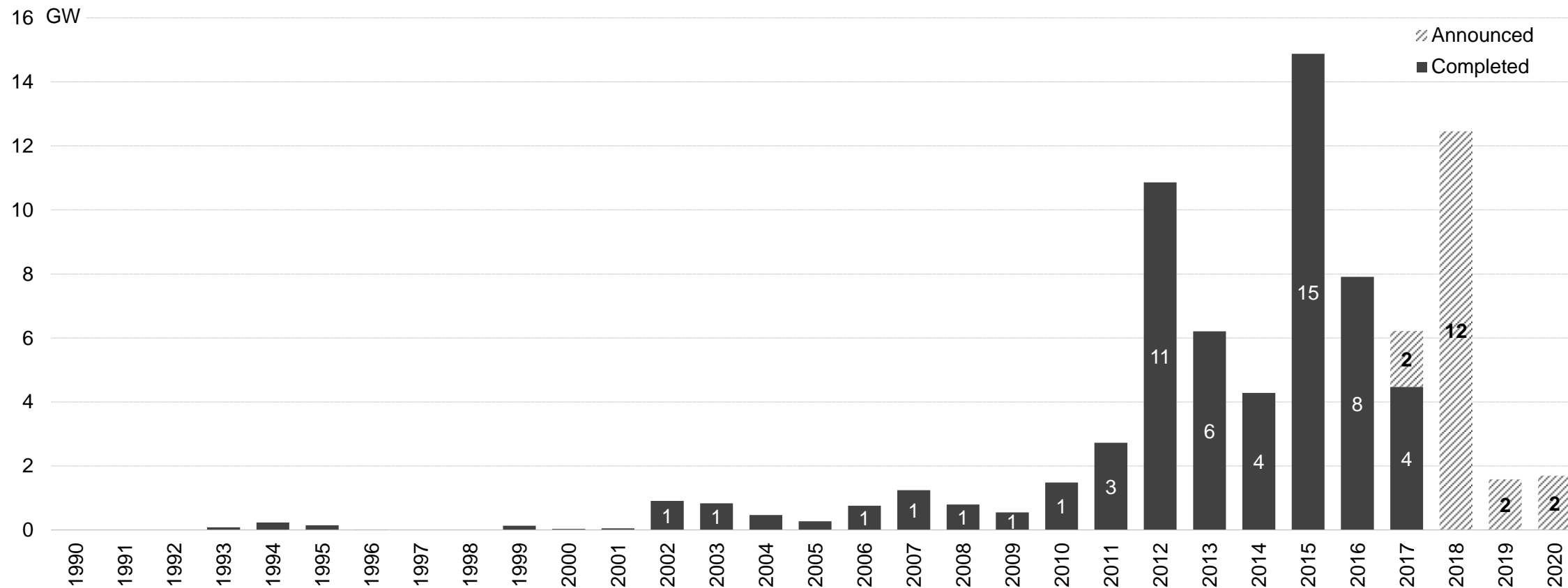
In the past 10 years*:



Source: EIA, BNEF Note: Values for 2017 are projected, accounting for seasonality, based on latest monthly values from EIA (data available through November 2017). *Percentage changes over the past 10 years are for share of total generation, not for the absolute number of MWh generated.

Coal retirements poised to near a record in 2018

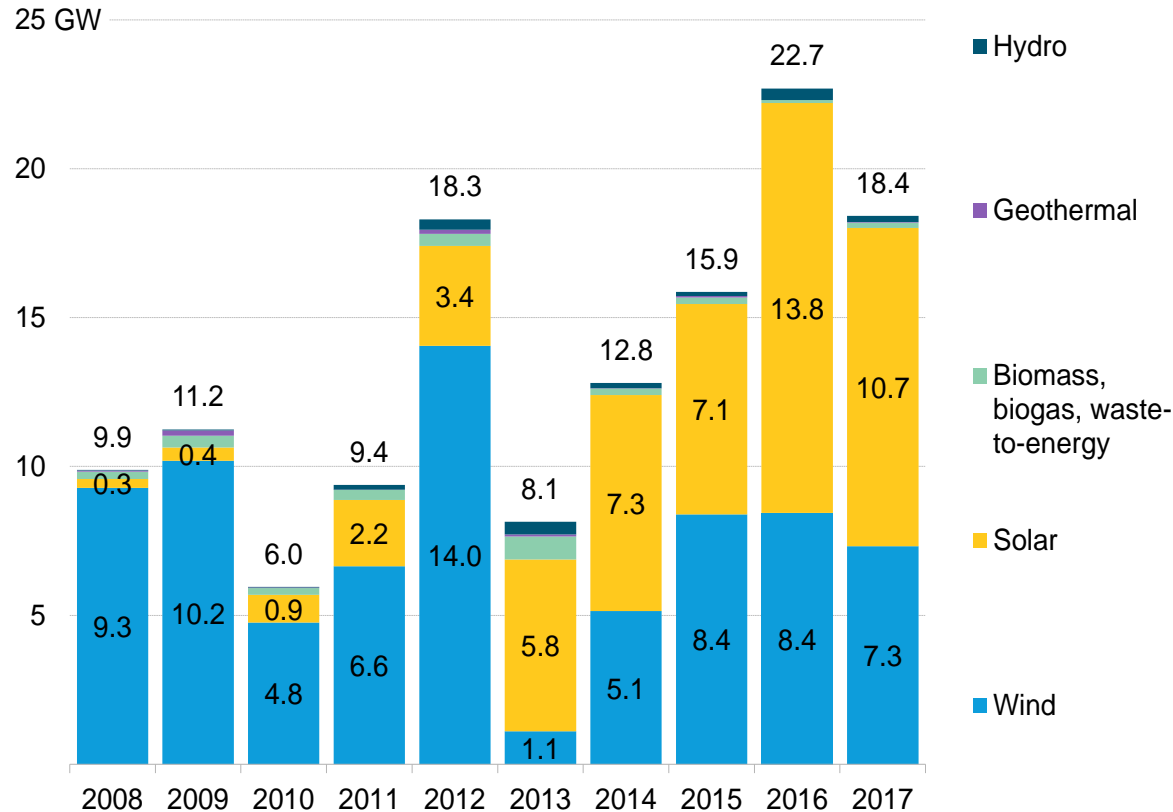
Coal plant retirements, completed and announced



Source: EIA, Bloomberg New Energy Finance Notes: "Retirements" does not include conversions from coal to natural gas or biomass; includes retirements or announced retirements reported to the EIA through November 2017. All capacity figures represent summer generating capacity.

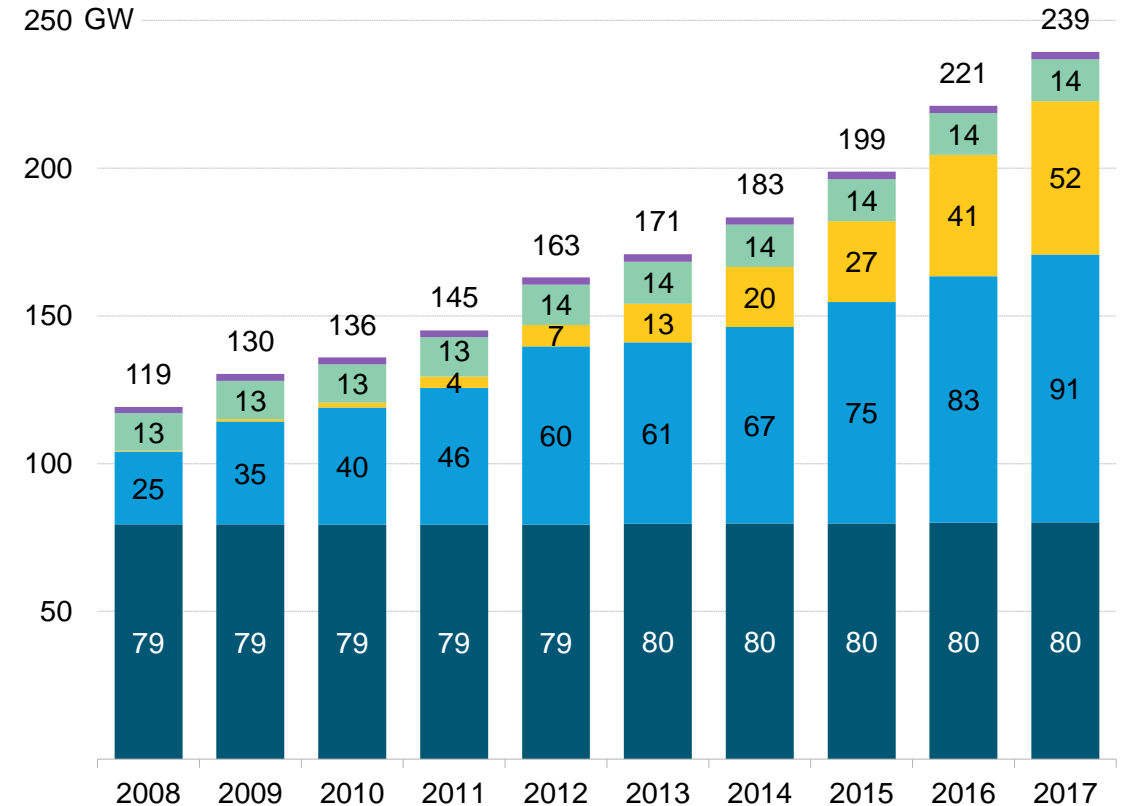
Renewable build also neared a record in 2017, amidst policy uncertainty

U.S. renewable build by technology



Source: Bloomberg New Energy Finance, EIA Notes: All values are shown in AC except solar, which is included as DC capacity. Numbers include utility-scale (>1MW) projects of all types, rooftop solar, and small- and medium-sized wind.

U.S. cumulative renewable capacity



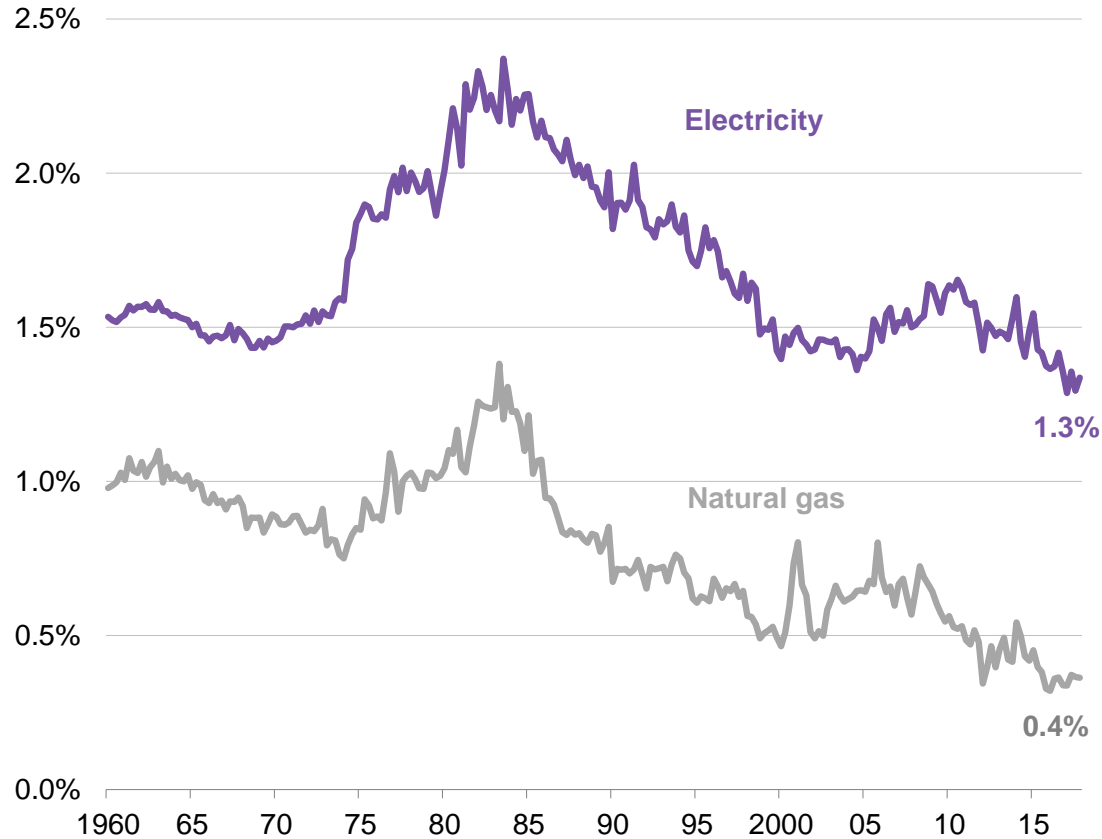
Source: Bloomberg New Energy Finance, EIA Notes: All values are shown in AC except solar, which is included as DC capacity. Hydropower capacity and generation exclude pumped storage facilities (unlike in past Factbooks). Totals may not sum due to rounding.

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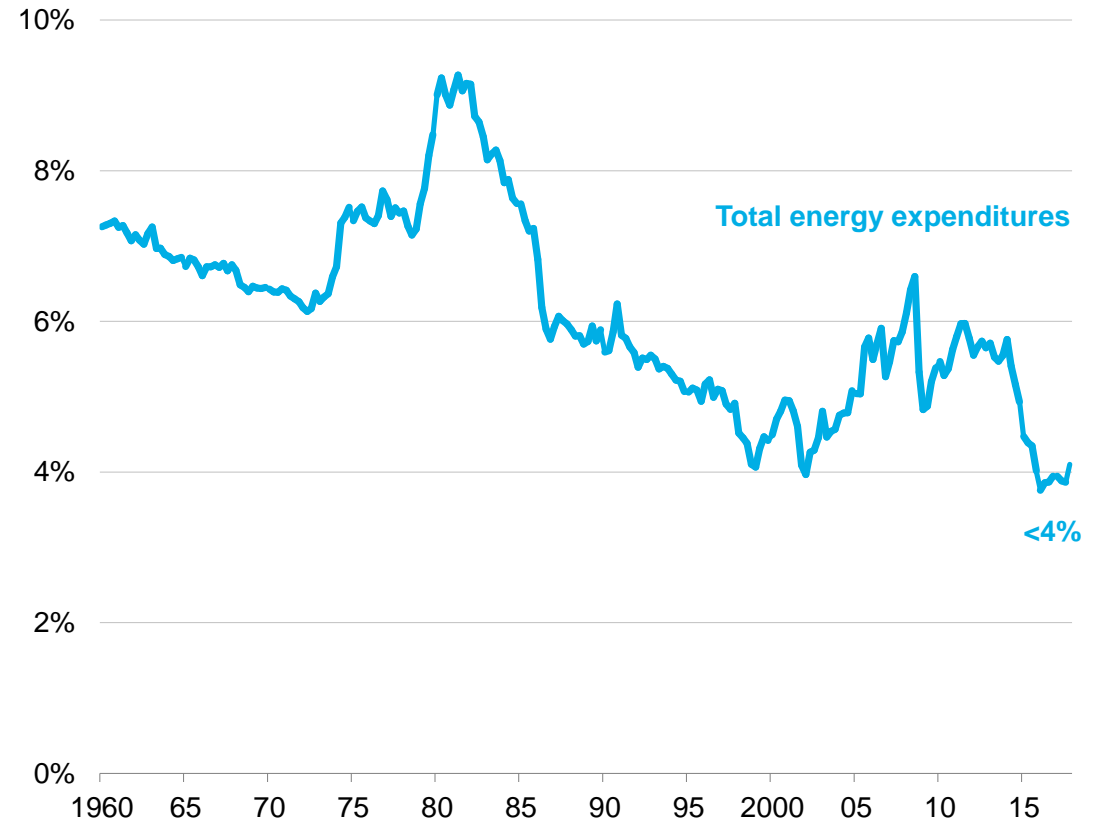
Electricity is making up a smaller share of household bills than ever before

Electricity and natural gas as share of total consumption expenditure



Source: Bureau of Economic Analysis, BNEF

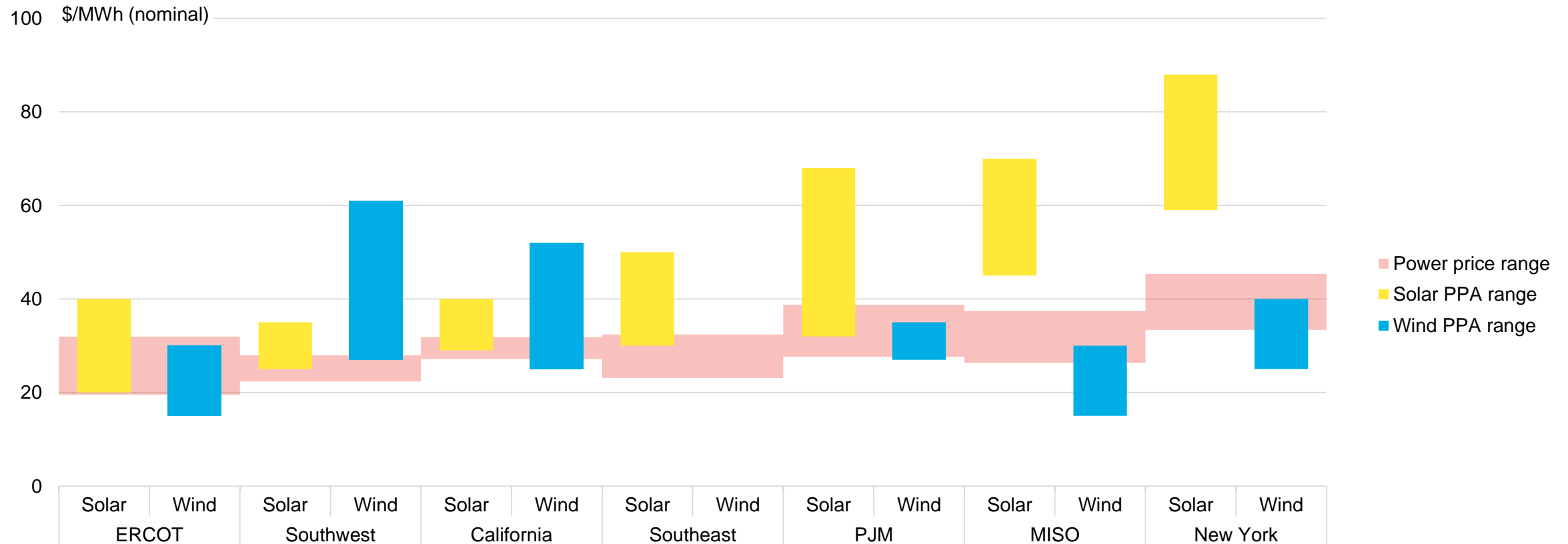
Total energy goods and services as share of total consumption expenditure



Source: Bureau of Economic Analysis, BNEF

Clean energy is no longer expensive: Wind, solar contracts are economic in parts of the U.S.

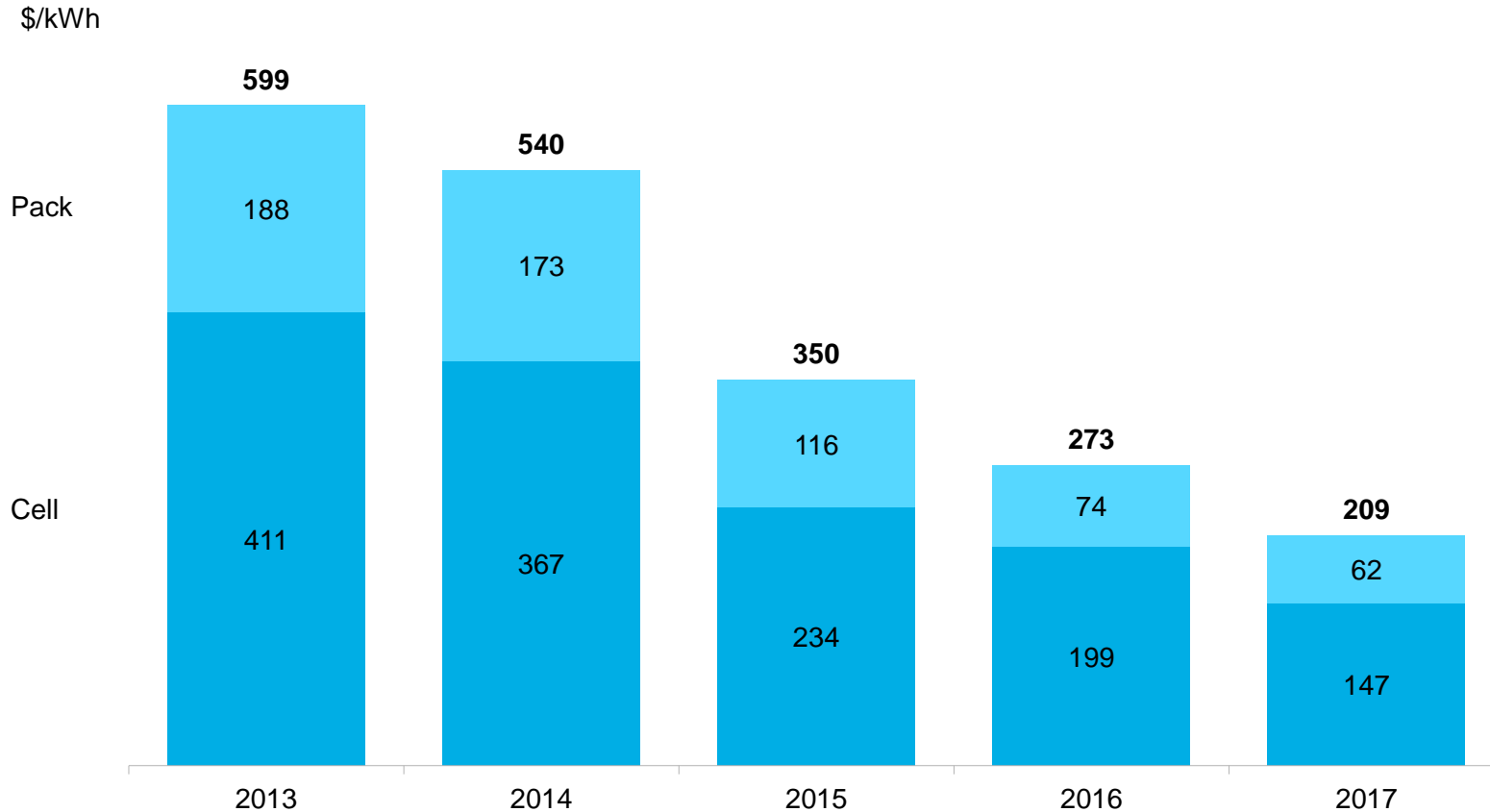
Wind, solar power purchase agreement price ranges (estimated) and power price ranges – by region



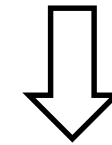
Source: Bloomberg New Energy Finance, SEC filings, interviews, analyst estimates Notes: MISO is the Midwest region; PJM is the Mid-Atlantic region; SPP is the Southwest Power Pool which covers the central southern U.S.; NEPOOL is the New England region; ERCOT covers most of Texas. Wholesale power prices are based on market-traded futures for calendar year 2018 for select nodes within each region.

Cheaper batteries are driving the falling cost of electric vehicles

Lithium-ion battery pack prices

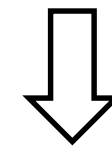


In the past 5 years:



-\$390/kWh
-65%

In 2017:

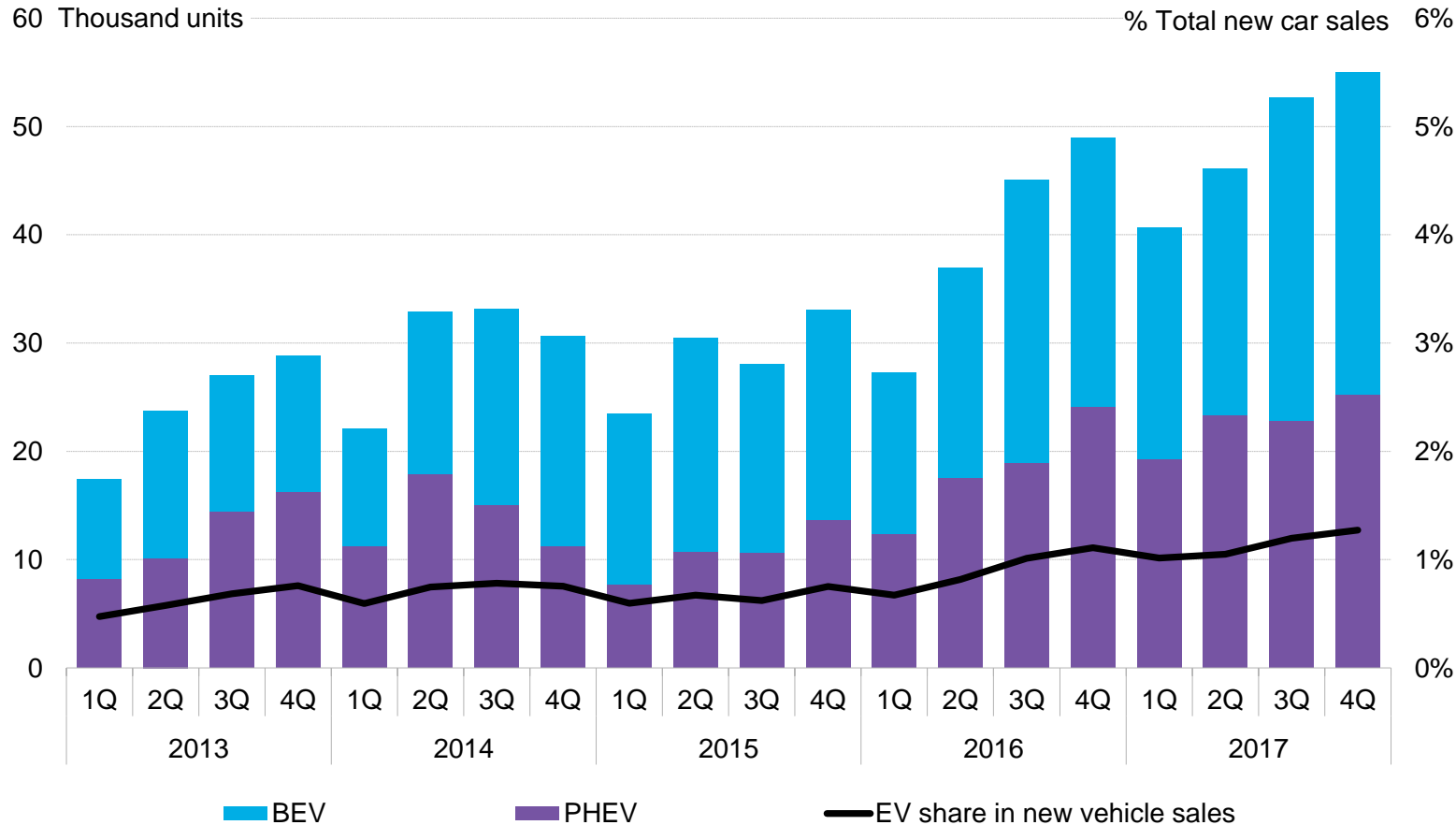


-\$64/kWh
-23%

Source: Bloomberg New Energy Finance Notes: BNEF has tracked lithium-ion battery prices since 2010 through an annual market survey process. It collects, anonymizes and aggregates price data for battery cells and packs. The numbers presented in the chart above include cell and pack prices for electric vehicles, and are in nominal terms.

Electric vehicle sales soared 23% in 2017, though still only 1% of new car sales

U.S. battery electric vehicle (BEV) and plug-in hybrid electric vehicle (PHEV) sales



In 2017:

BEV sales: ~104,000

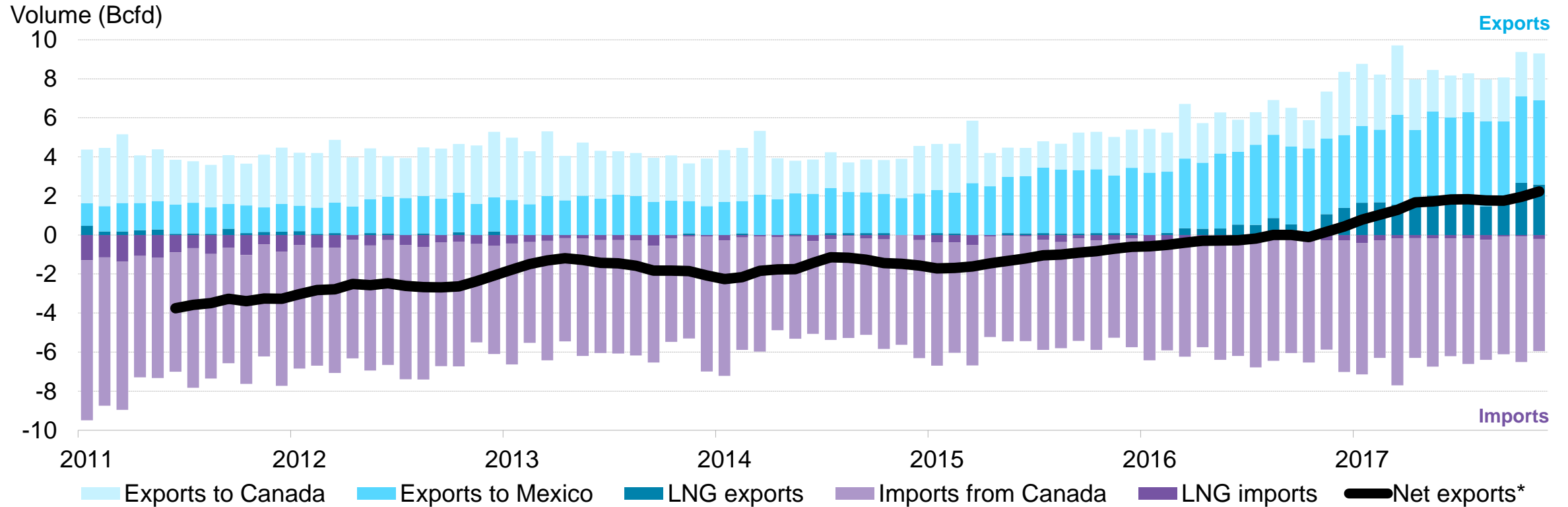
PHEV sales: ~91,000

**EVs on U.S. roads:
~749,000**

Source: Bloomberg New Energy Finance

For the first time, the U.S. was a net natural gas exporter every month of the year

U.S. natural gas exports and imports



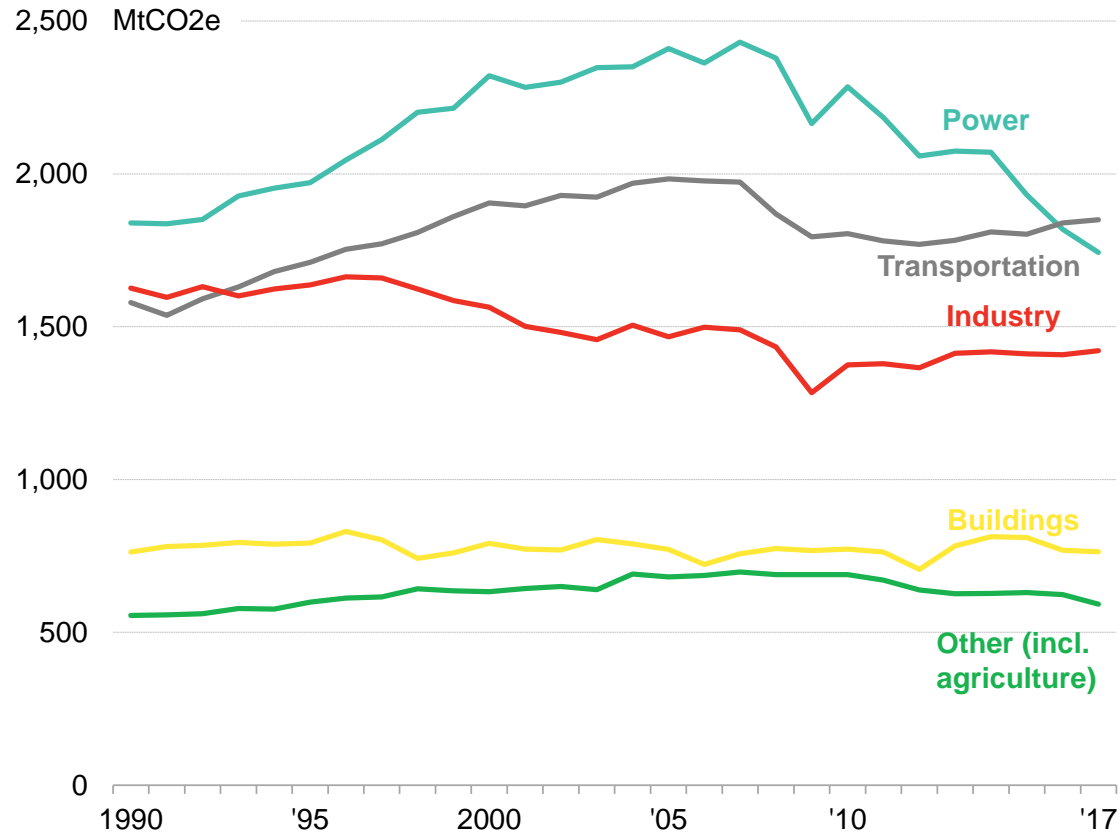
Source: Bloomberg Terminal, EIA Note: *Net export line shows the six-month rolling average.

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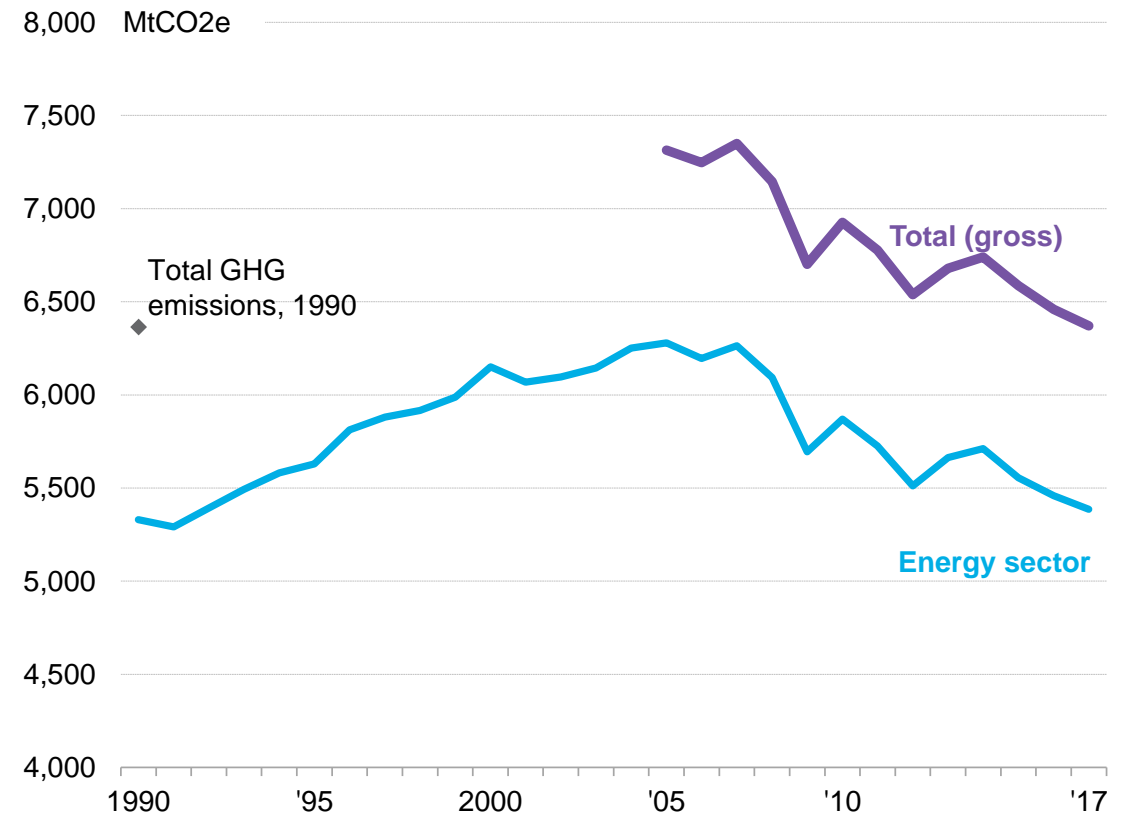
Power sector emissions have plunged, taking down total U.S. emissions

Emissions by sector



Source: Bloomberg New Energy Finance, EIA, EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015. Values for 2017 are projected, accounting for seasonality, based on monthly values from EIA available through October 2017.

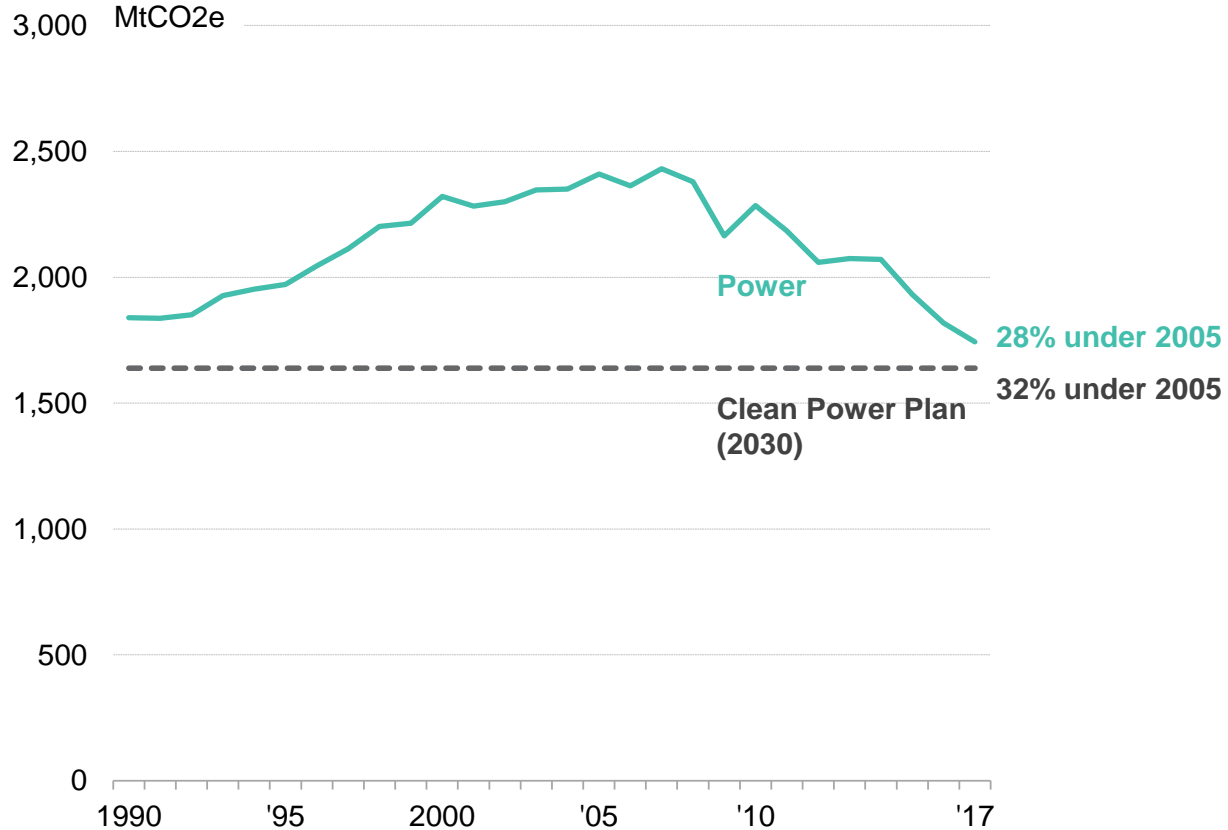
Economy-wide and energy sector emissions



Source: Bloomberg New Energy Finance, EIA, EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015. Values for 2017 are projected, accounting for seasonality, based on monthly values from EIA available through October 2017.

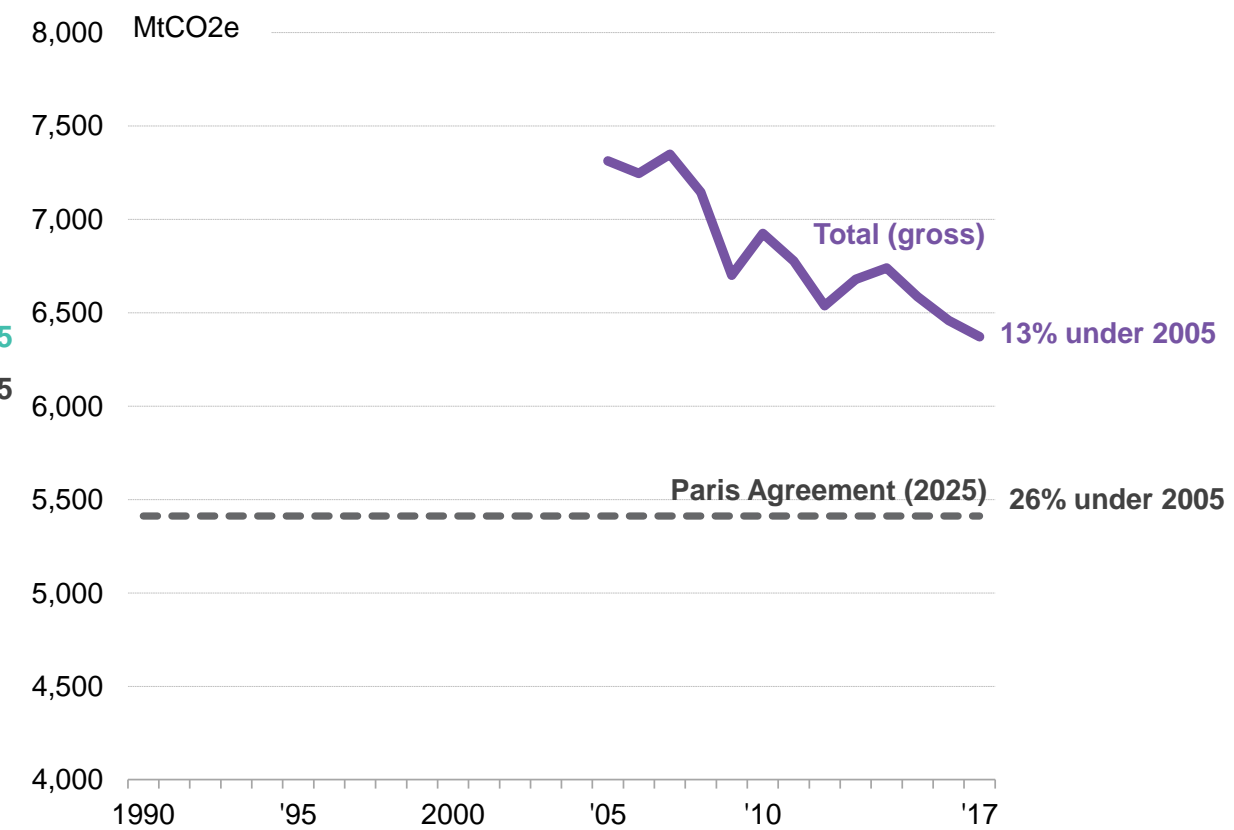
As a result, U.S. has made progress towards its former climate targets

Power sector emissions



Source: Bloomberg New Energy Finance, EIA, EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015. Values for 2017 are projected, accounting for seasonality, based on monthly values from EIA available through October 2017.

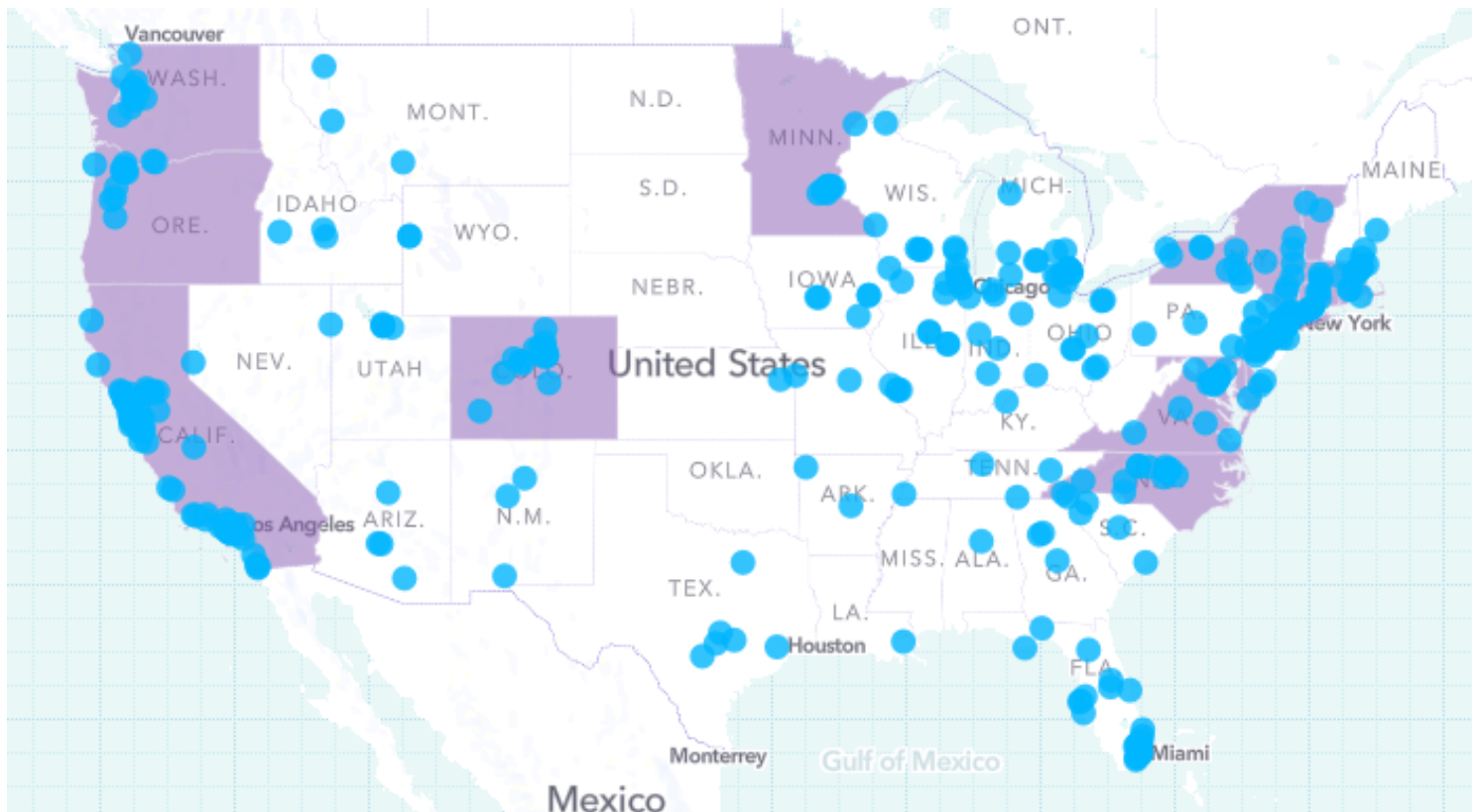
Economy-wide and energy sector emissions



Source: Bloomberg New Energy Finance, EIA, EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015. Values for 2017 are projected, accounting for seasonality, based on monthly values from EIA available through October 2017.

U.S. withdraws from Paris, but sub-national leaders say “We Are Still In”

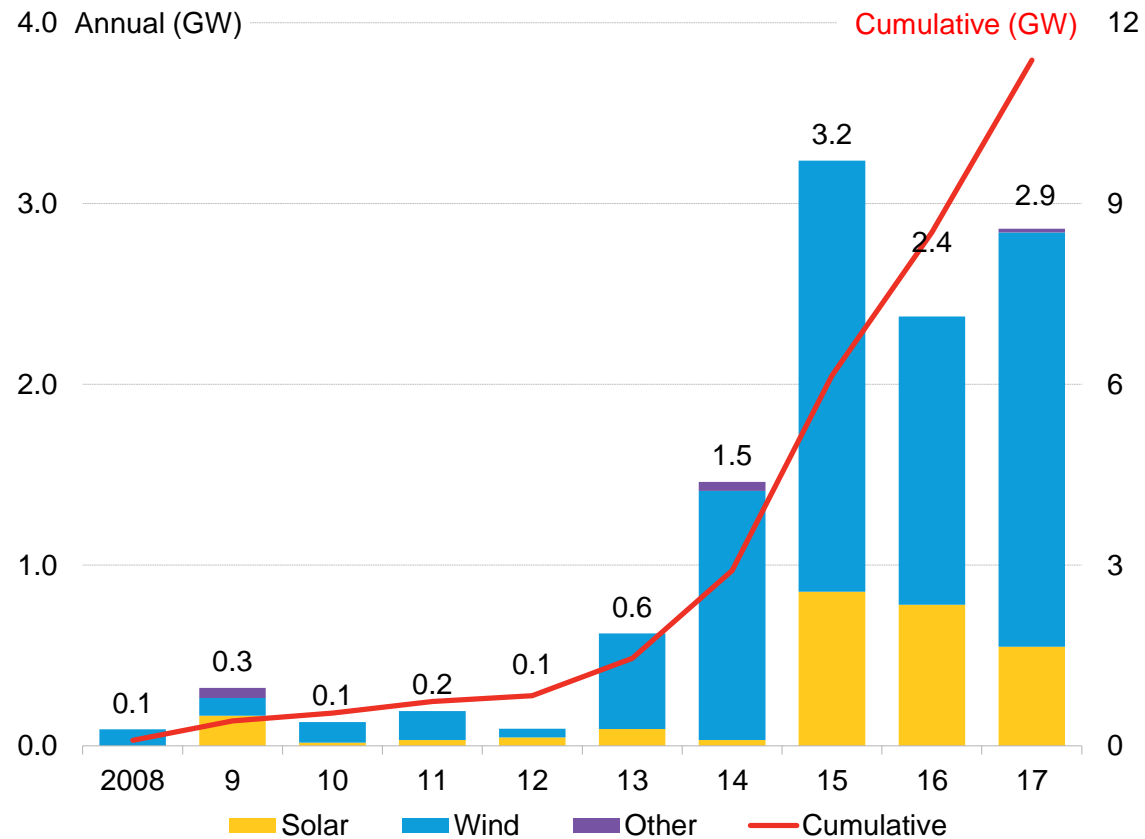
State members of the U.S. Climate Alliance and city members of Climate Mayors



Source: Bloomberg Terminal, We Are Still In, America's Pledge, Climate Mayors, U.S. Climate Alliance, Simple Maps Note: Hawai'i and Puerto Rico have also pledged to the Climate Alliance but are not visible in the map above. Other state members not clearly visible include Massachusetts, Maryland, Rhode Island, Vermont and Delaware.

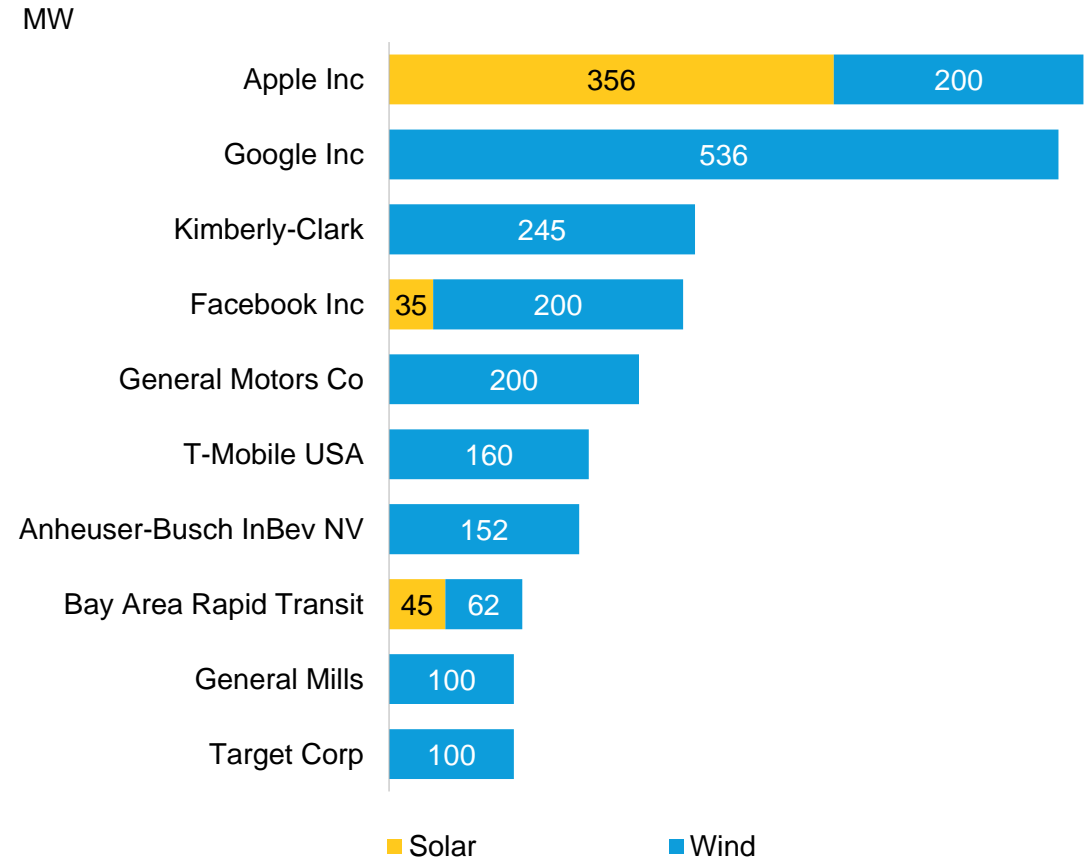
Corporations “Are Still In” (Part I)

Renewable capacity contracted by corporations, by technology



Source: Bloomberg New Energy Finance Note: Charts show offsite PPAs only

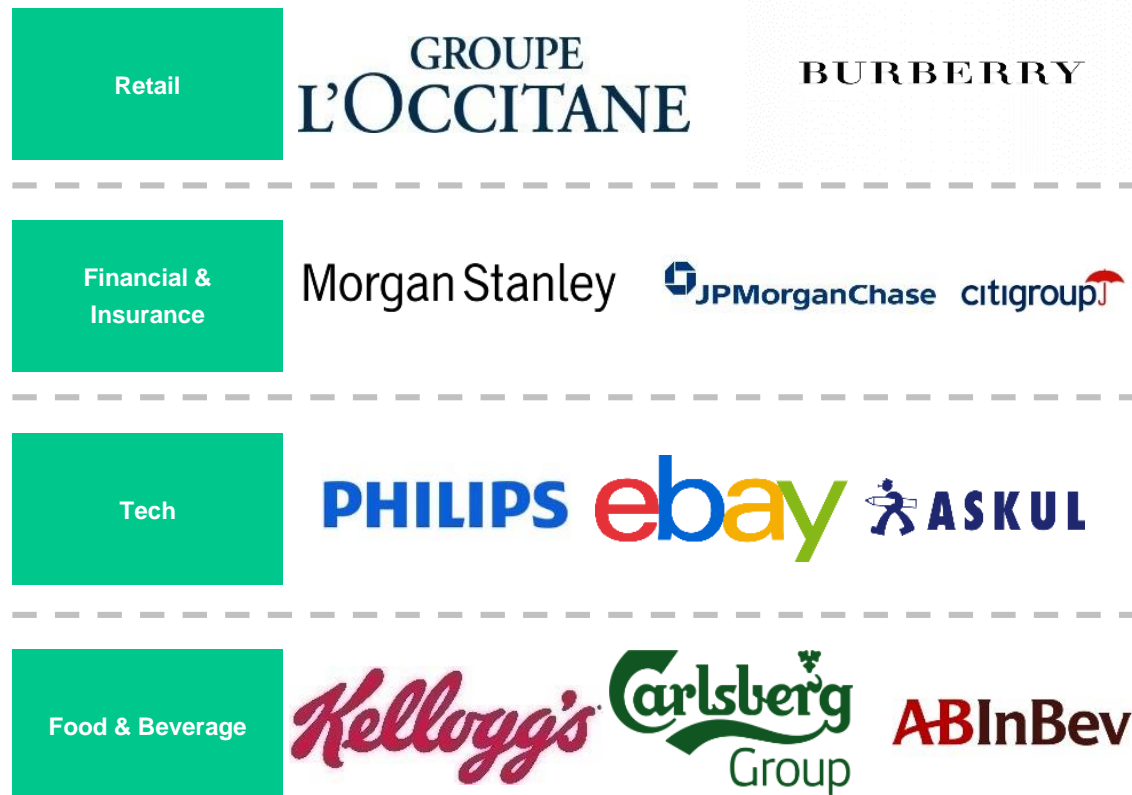
Largest corporate offtakers, 2017



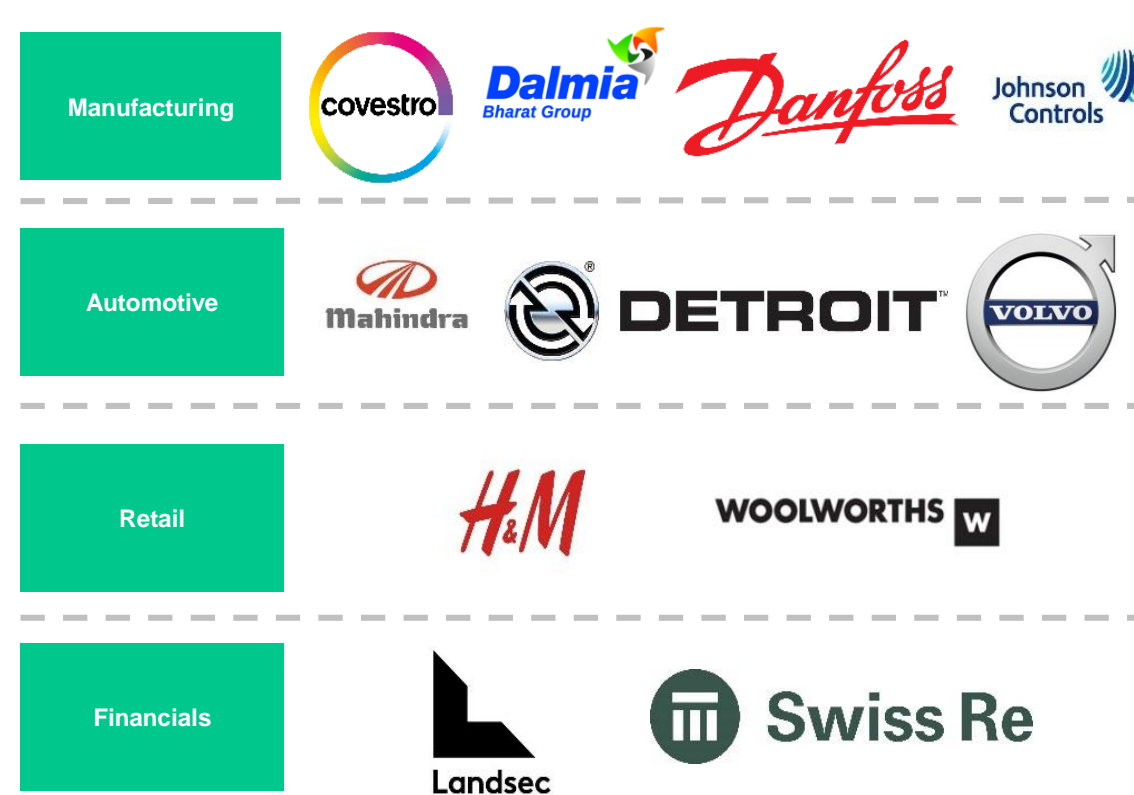
Source: Bloomberg New Energy Finance Note: Charts show offsite PPAs only

Corporations “Are Still In” (Part II)

Key players: Corporate clean energy procurement



Key players: Corporate energy efficiency



Source: Bloomberg New Energy Finance, The Climate Group, company announcements, DOE Note: Corporate clean energy procurement key players are companies that signed onto the RE100 in 2017.

Source: Bloomberg New Energy Finance, The Climate Group, company announcements, DOE Note: The key corporate energy efficiency players displayed here are drawn from EP100 members and the list of ISO 50001 certified facilities. ISO 50001 certification means that a company has met established efficiency standards at one or more of its facilities.

2017 in review

2017 was a year of change for sustainable energy policy...

1. U.S. left behind the Clean Power Plan, Paris Agreement
2. Department of Energy proposed FERC ruling to support “secure fuel” technologies
3. Trade case threatened tariffs on solar equipment
4. Tax reform clouded future of financing for clean technologies

...but sustainable energy continued to make progress

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Power & Utilities

Gas

Carbon Markets & Climate Negotiations

Energy Smart Technologies

Storage

Electric Vehicles

Mobility and Autonomous Driving

Frontier Power

Emerging Technologies

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