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Environmental and  
Energy Study Institute



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# 2023 Sustainable Energy in America Factbook

Wednesday, March 15, 2023

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A bipartisan Congressional caucus founded EESI in 1984 to provide non-partisan information on environmental, energy, and climate policies

## **Direct Assistance for Equitable and Inclusive Financing Program**

In addition to a full portfolio of federal policy work, EESI provides direct assistance to utilities to develop “on-bill financing” programs

## **Commitment to Diversity, Equity, Inclusion, and Justice**

We recognize that systemic barriers impede fair environmental, energy, and climate policies and limit the full participation of Black, Indigenous, people of color, and legacy and frontline communities in decision-making

## **Sustainable Solutions**

*Our mission is to advance science-based solutions for climate change, energy, and environmental challenges in order to achieve our vision of a sustainable, resilient, and equitable world.*

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## Fact Sheets and Issue Briefs



Timely, objective coverage of environmental, clean energy, and climate change topics

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Active engagement on Twitter, Facebook, LinkedIn, and YouTube



# The Energy Transition: Hardwired Into US Growth

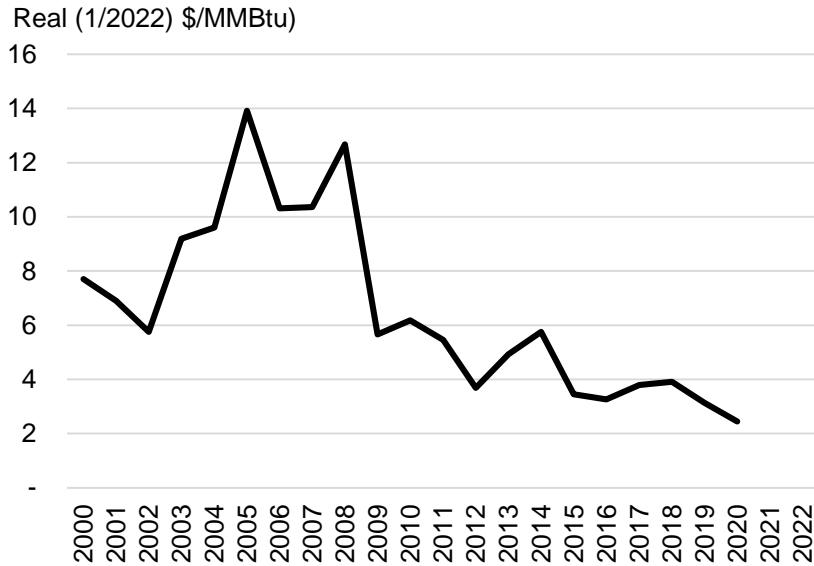
Sustainable Energy in America Factbook  
presentation to EESI

Ethan Zindler

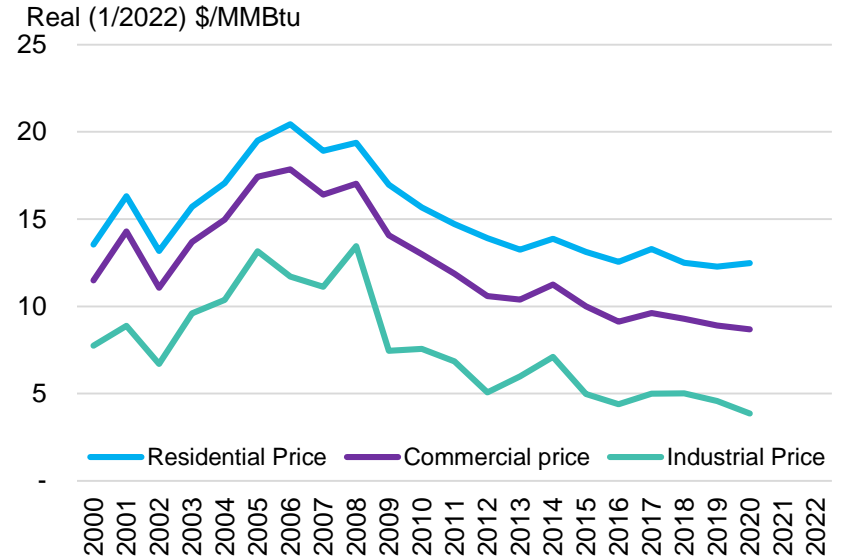
March 15, 2023

# US energy overview: US natural gas pricing, wholesale and by end use

## Natural gas wholesale prices at Henry Hub, LA



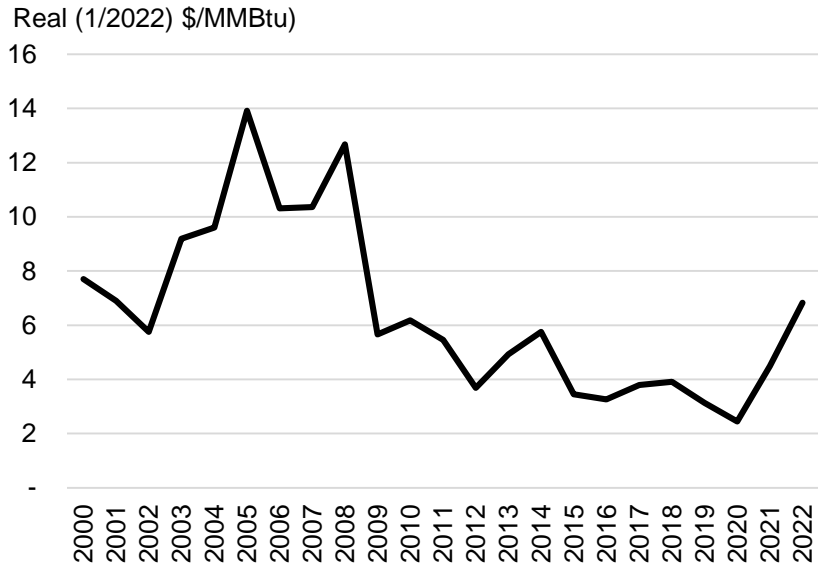
## Natural gas prices to end users, US average



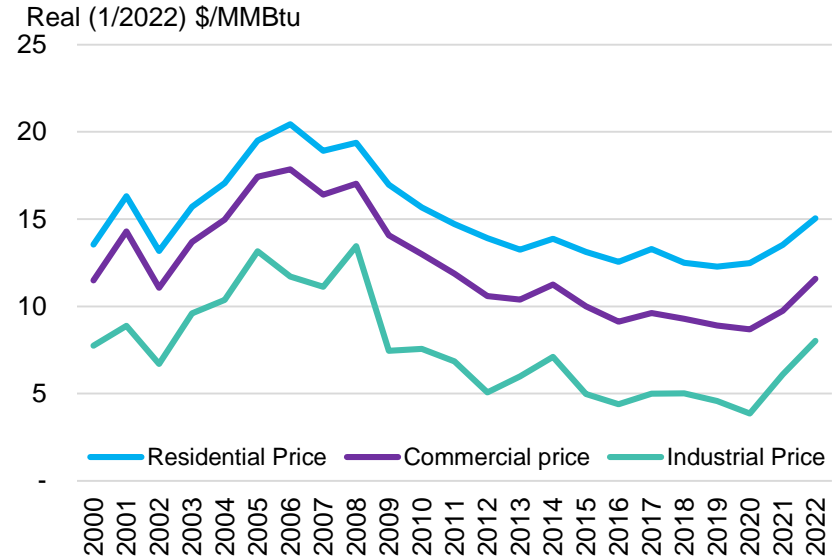
Source: BloombergNEF, EIA Short Term Energy Outlook

# US energy overview: US natural gas pricing, wholesale and by end use

## Natural gas wholesale prices at Henry Hub, LA



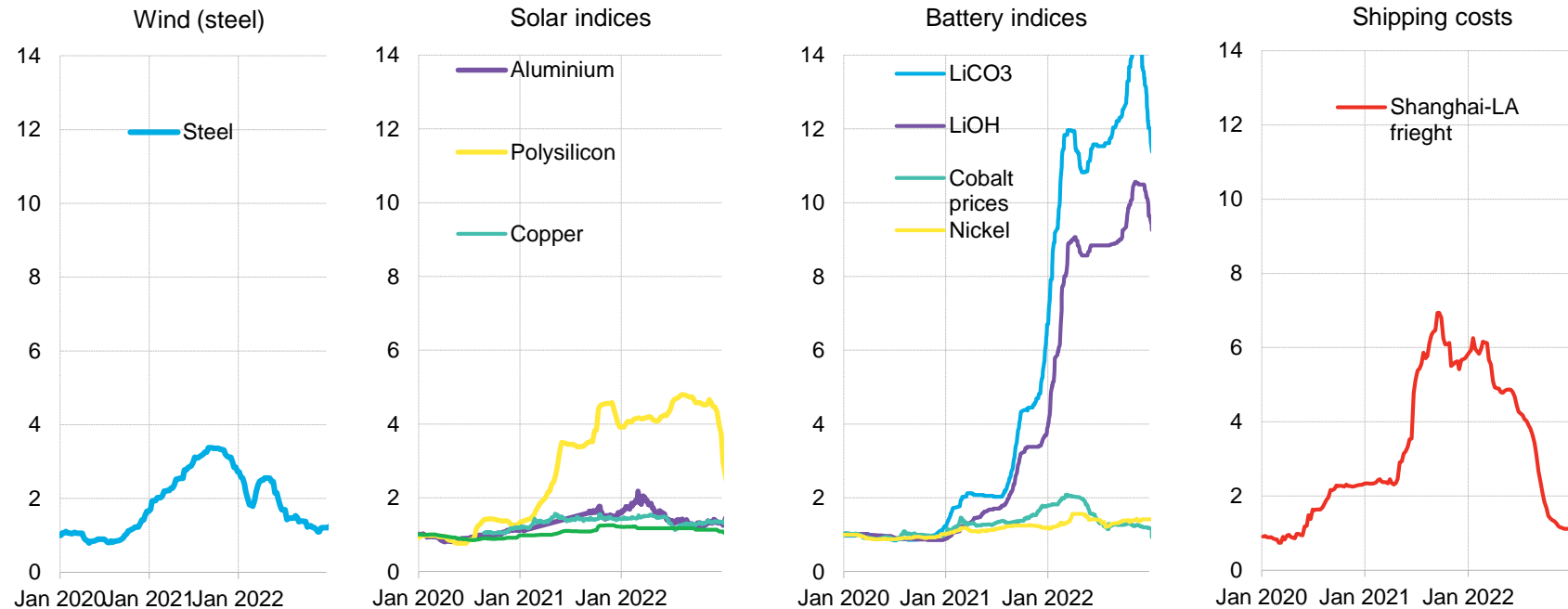
## Natural gas prices to end users, US average



Source: BloombergNEF, EIA Short Term Energy Outlook

# Economics: Commodity costs for wind/solar/batteries/other equipment

## Price movements since January 2020

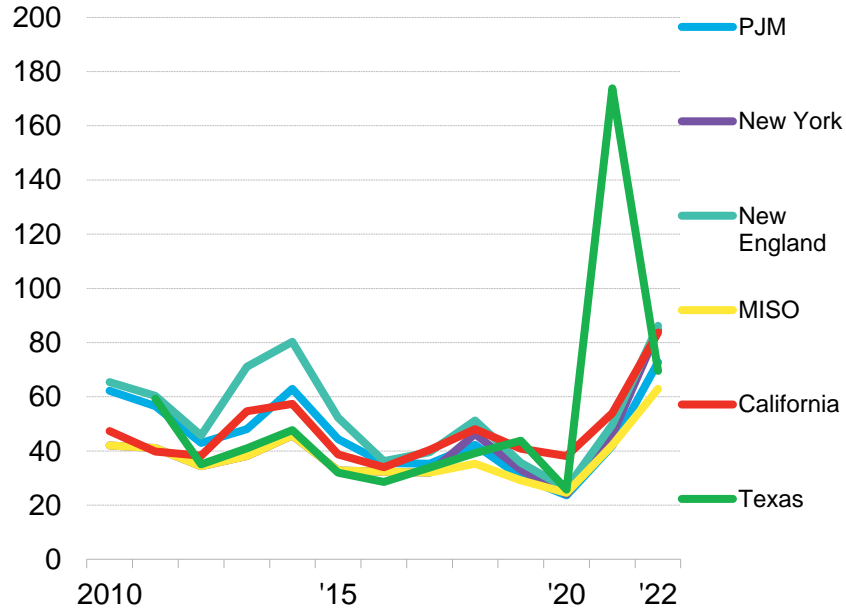


Source: 2H 2022 US Clean Energy/Market Outlook, BloombergNEF, Bloomberg Terminal. Note: Data rebased to 1 on earliest available date in January 2020. Steel reflects North America costs, while aluminum and copper are China prices –more details as well as Bloomberg Terminal tickers available in the Excel attached to the report.

# US energy overview: Retail and wholesale power prices

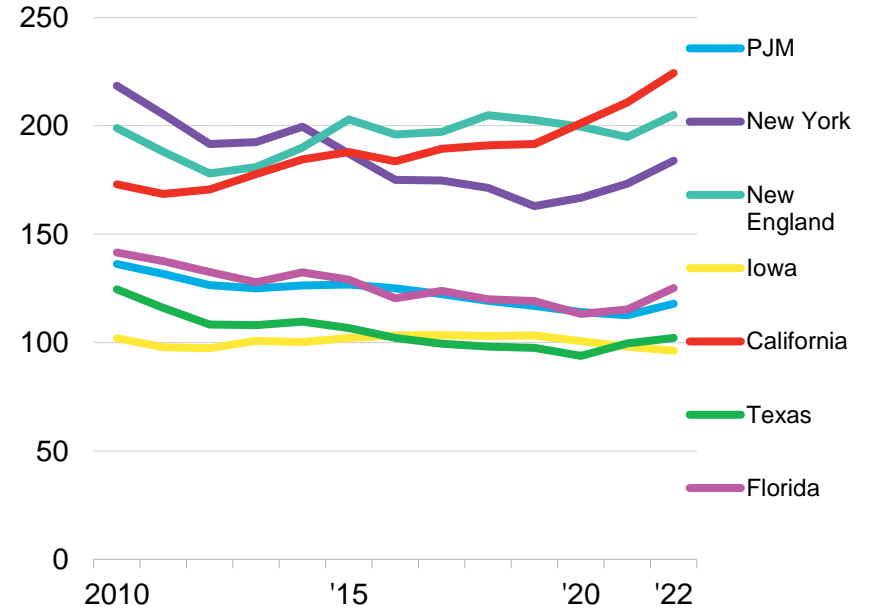
## Wholesale power prices

\$/MWh (real-2022)



## Retail power prices

\$/MWh (real-2022)



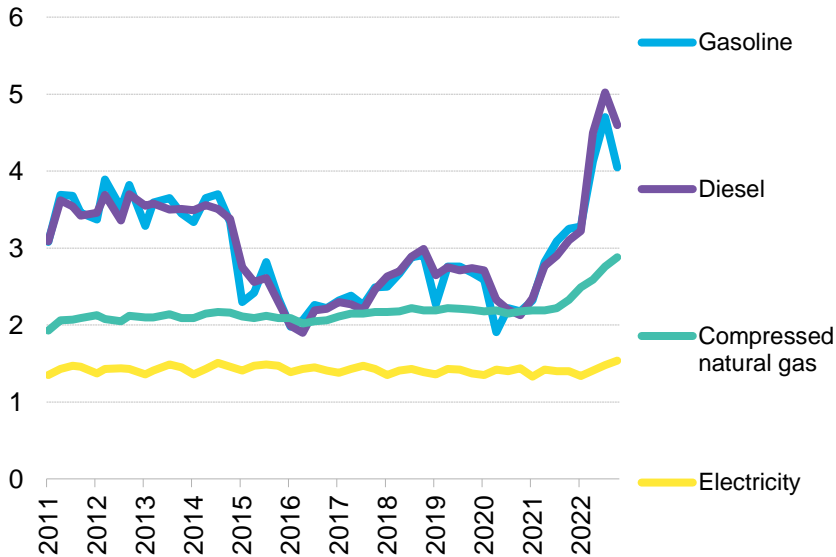
Source: BloombergNEF, EIA, Bloomberg Terminal Notes: Wholesale prices are taken from proxy power hubs in each ISO. All prices are in real 2022 USD. Retail power prices shown here are not exact retail rates but weighted averages across all rate classes by state, as published by the EIA. Retail prices are updated through November 2022.



# Vehicle fuel prices and EV sales

## Average vehicle fuel prices

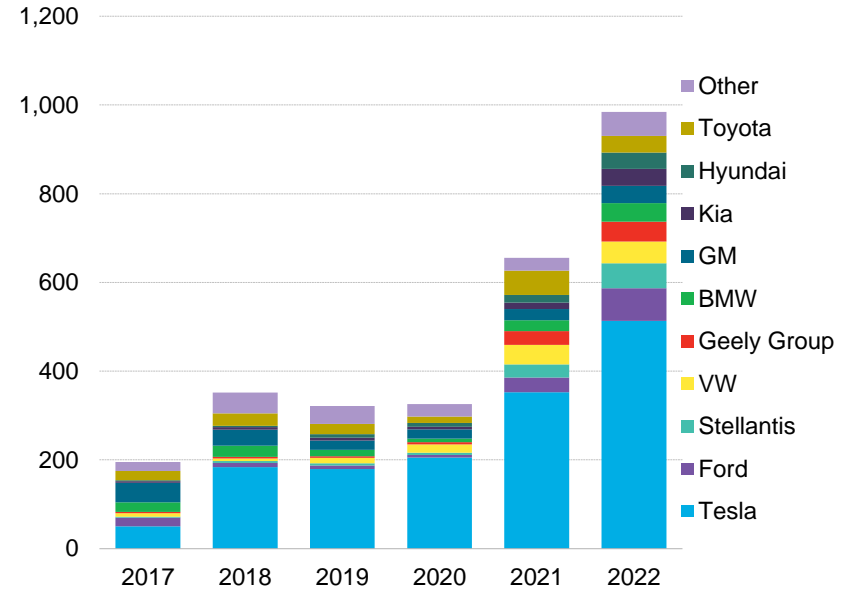
\$/gasoline gallon equivalent (GGE)



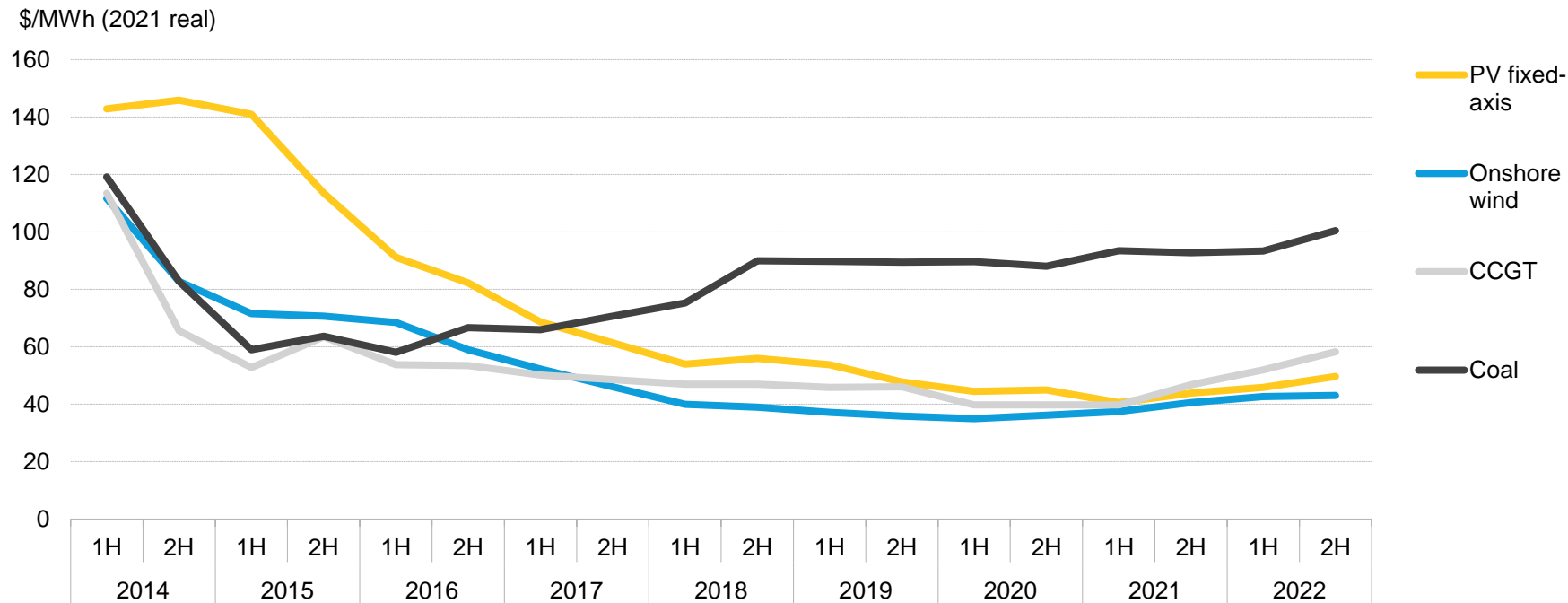
Source: BloombergNEF, Marklines, US Department of Energy.

## US electric vehicle sales

Thousand



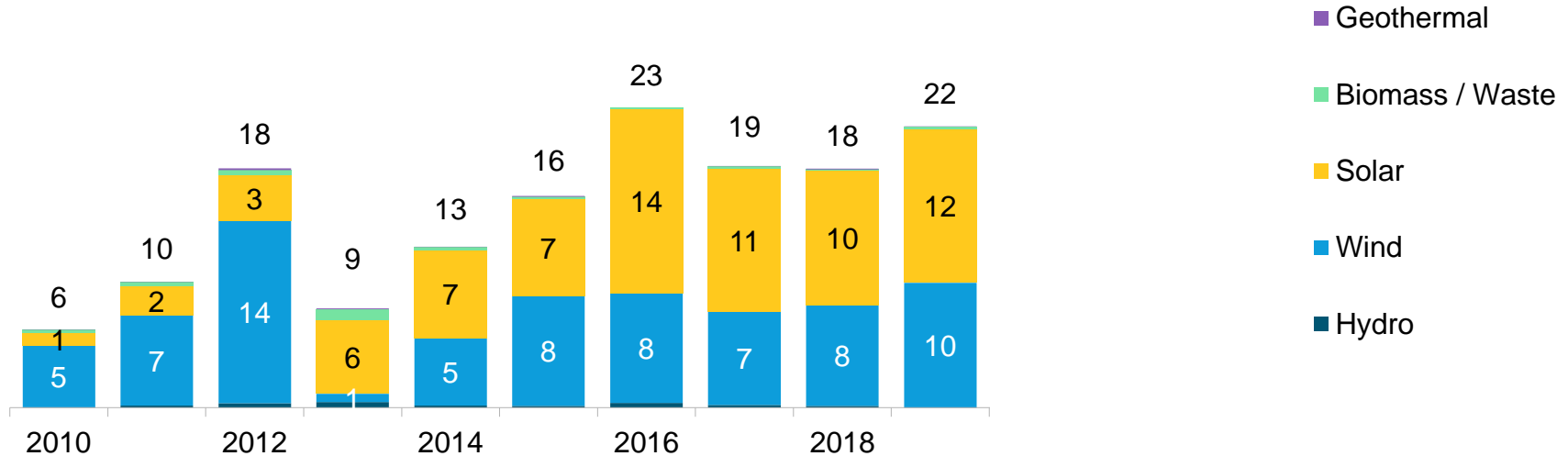
# Economics: US levelized costs of electricity, 2014-22



Source: BloombergNEF. BNEF started collecting country-level LCOE inputs in 2014, prior to 2014 only global LCOE are available see LCOE report. LCOE displayed by financing date.

# US energy overview: Renewable energy capacity build by technology

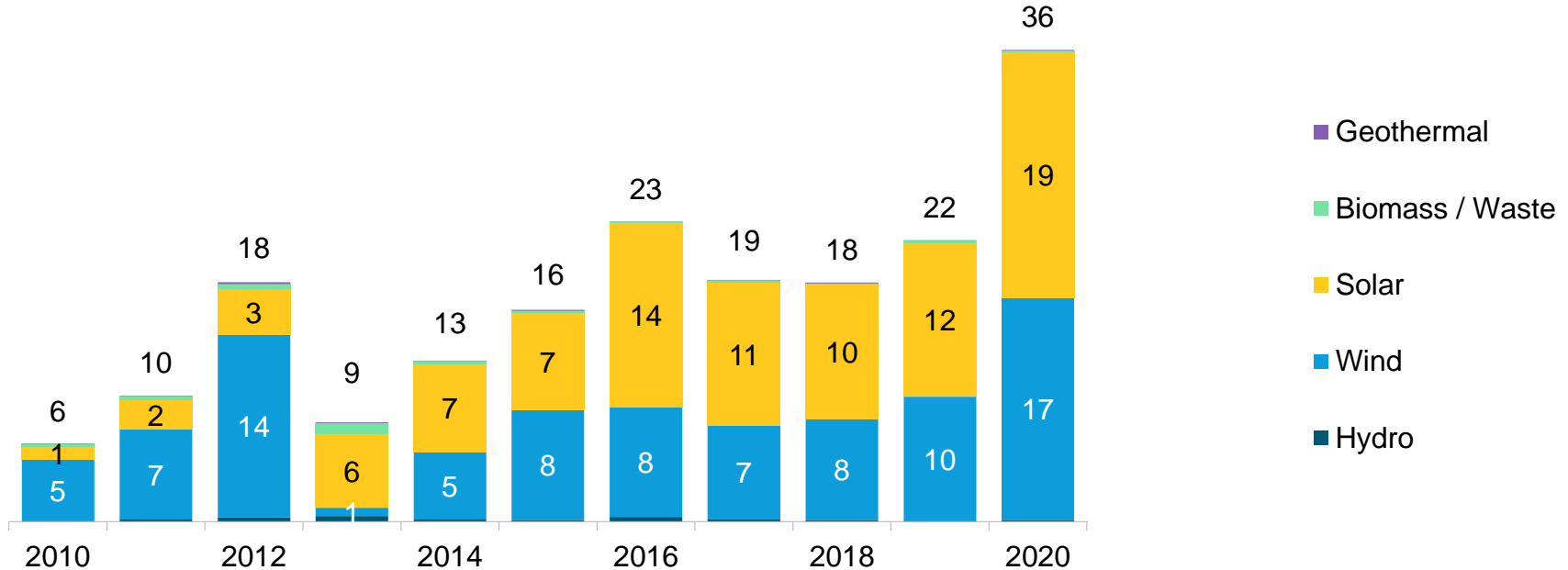
GW



Source: BloombergNEF, 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. Includes installations or planned installations reported to the EIA through October 2021, as well as BloombergNEF projections.

# US energy overview: Renewable energy capacity build by technology

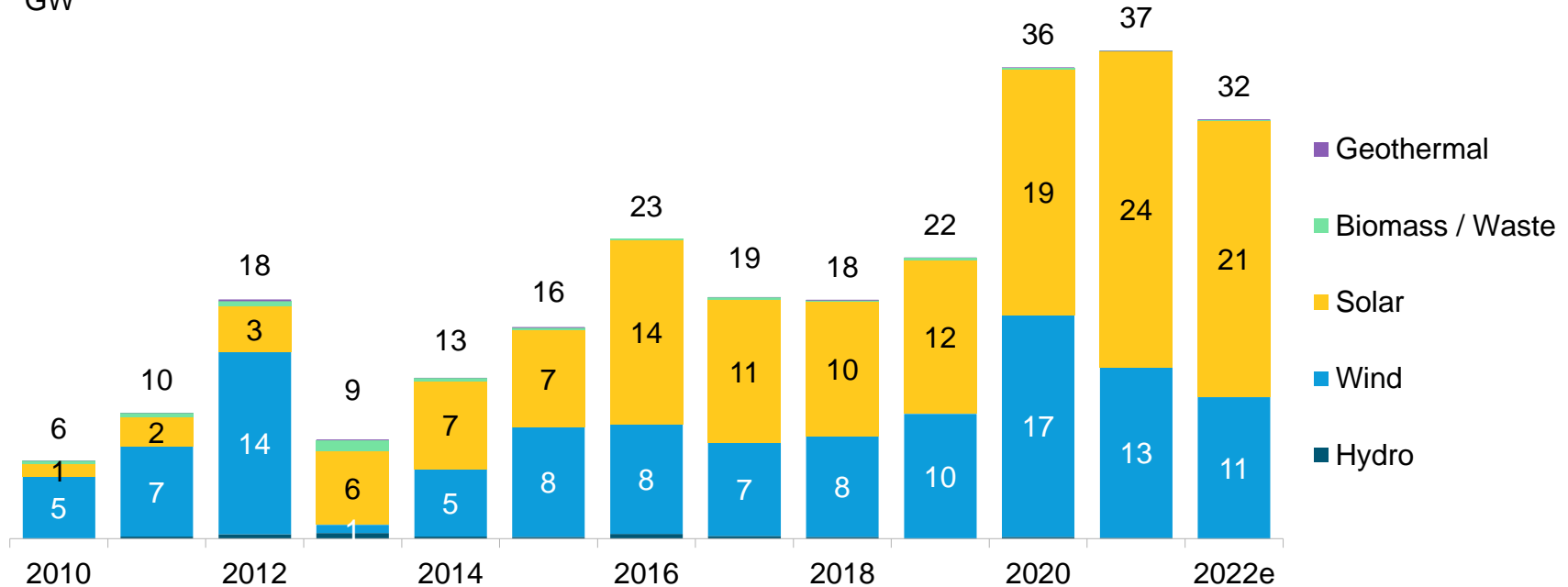
GW



Source: BloombergNEF, 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. Includes installations or planned installations reported to the EIA through October 2021, as well as BloombergNEF projections.

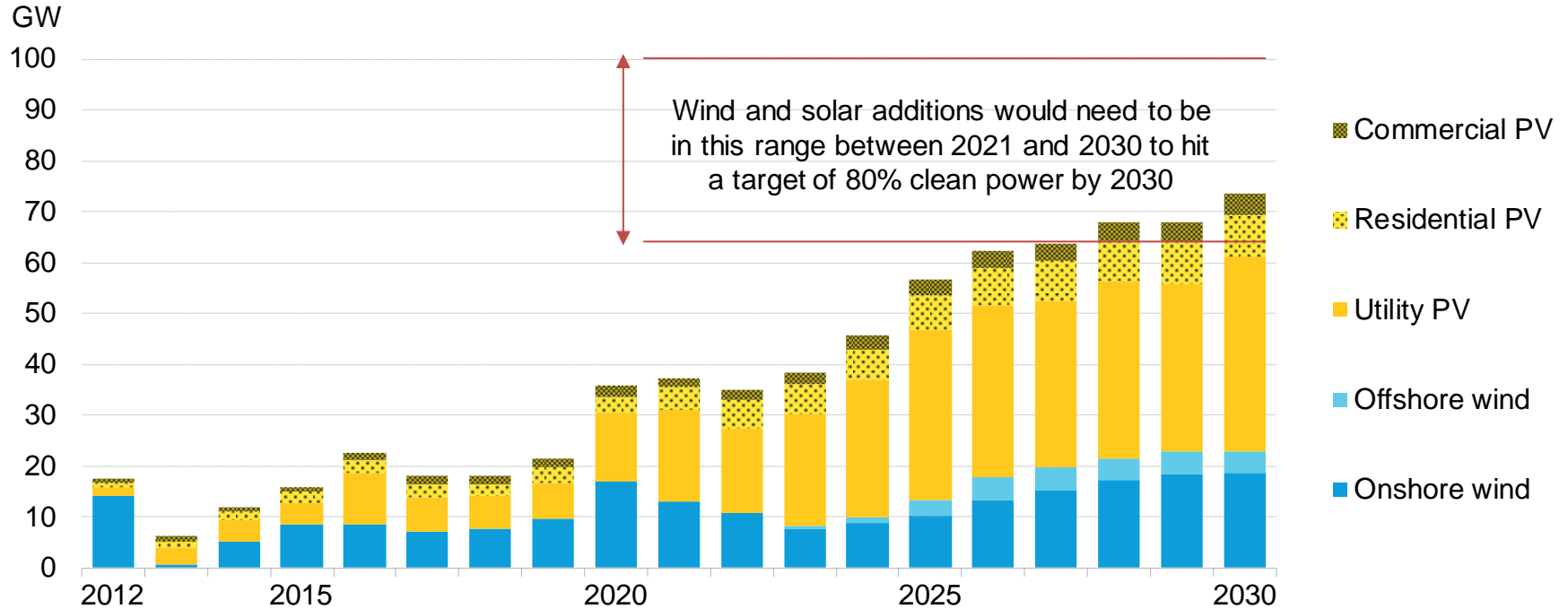
# US energy overview: Renewable energy capacity build by technology

GW



Source: BloombergNEF, 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. Includes installations or planned installations reported to the EIA through October 2021, as well as BloombergNEF projections.

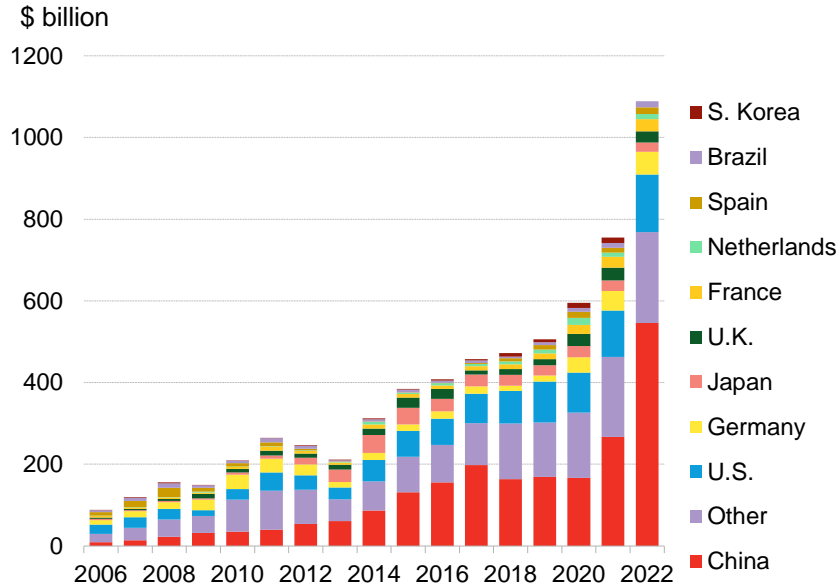
# Projected annual US wind and solar capacity additions



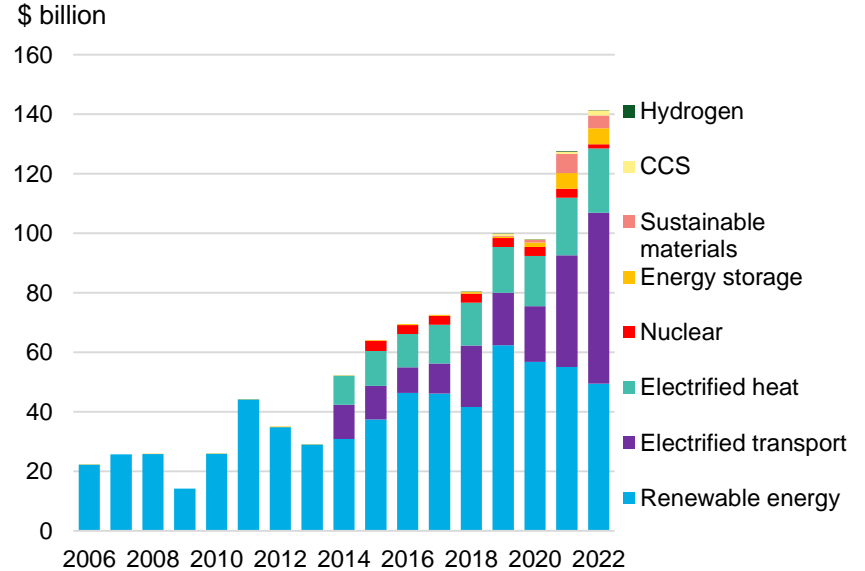
Source: BloombergNEF

# Finance: Energy transition investment

## Energy transition investment, by country



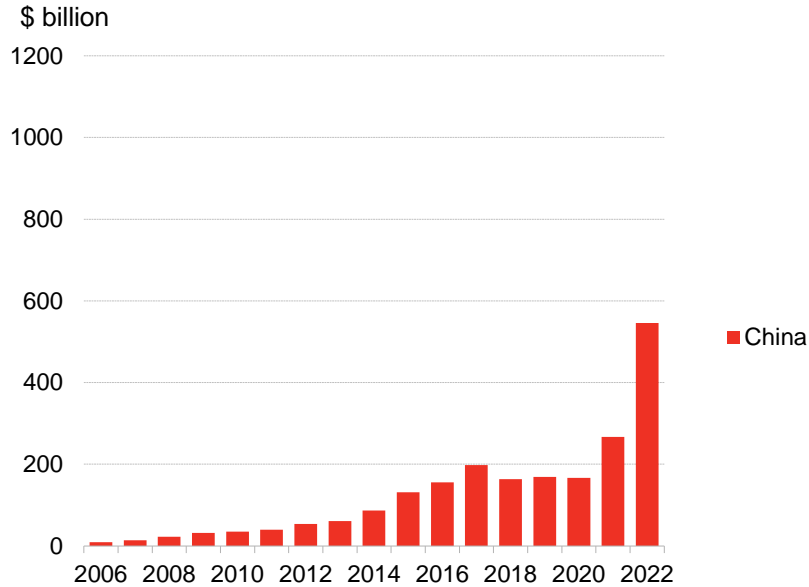
## US energy transition investment, by sector



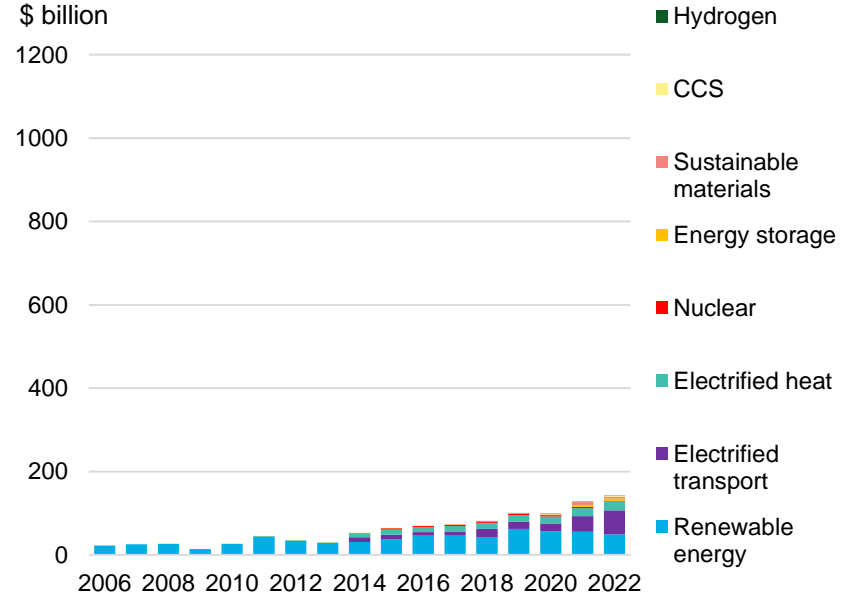
Source: BloombergNEF, "Energy Transition Investment Trends, 2022". Note: BNEF has updated and expanded its coverage of energy transition investment and slightly modified its methodology. For more see <https://www.bnef.com/flagships/clean-energy-investment>.

# Finance: Energy transition investment

## Energy transition investment, by country



## US energy transition investment, by sector

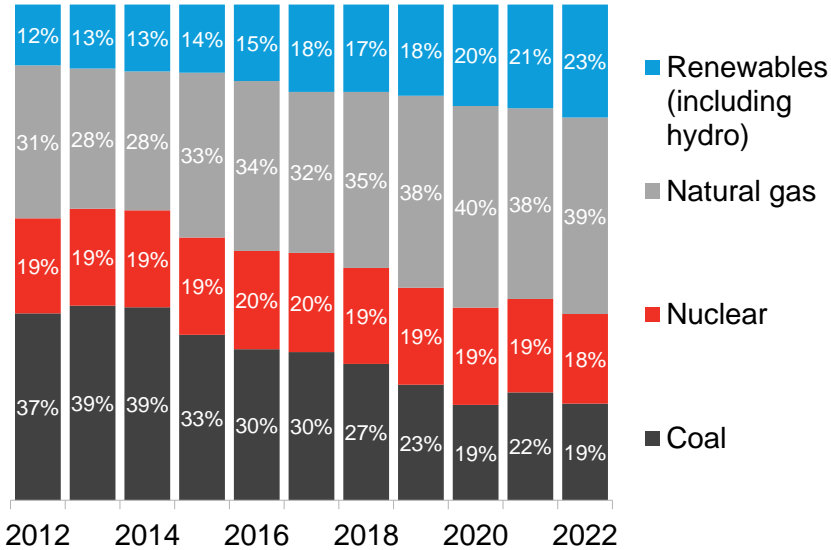


Source: BloombergNEF, "Energy Transition Investment Trends, 2022". Note: BNEF has updated and expanded its coverage of energy transition investment and slightly modified its methodology. For more see <https://www.bnef.com/flagships/clean-energy-investment>.

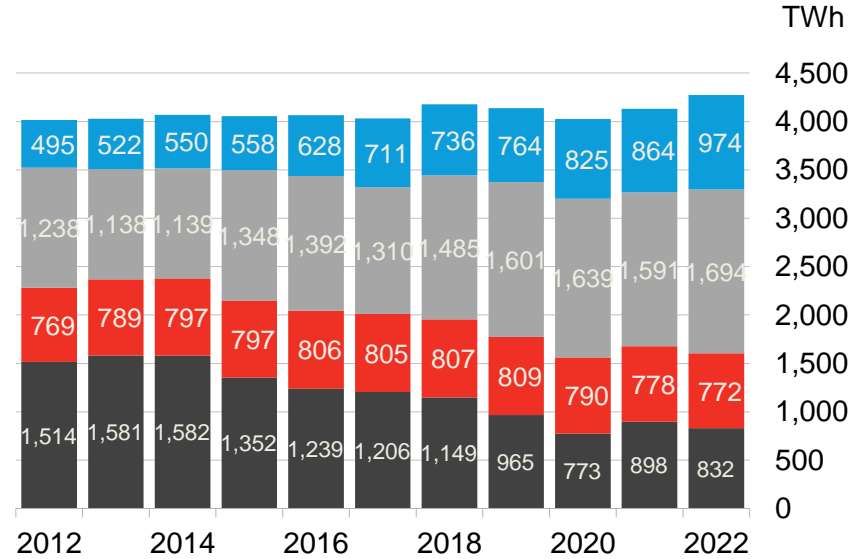


# US energy overview: Electricity generation mix

## US electricity generation, by fuel type

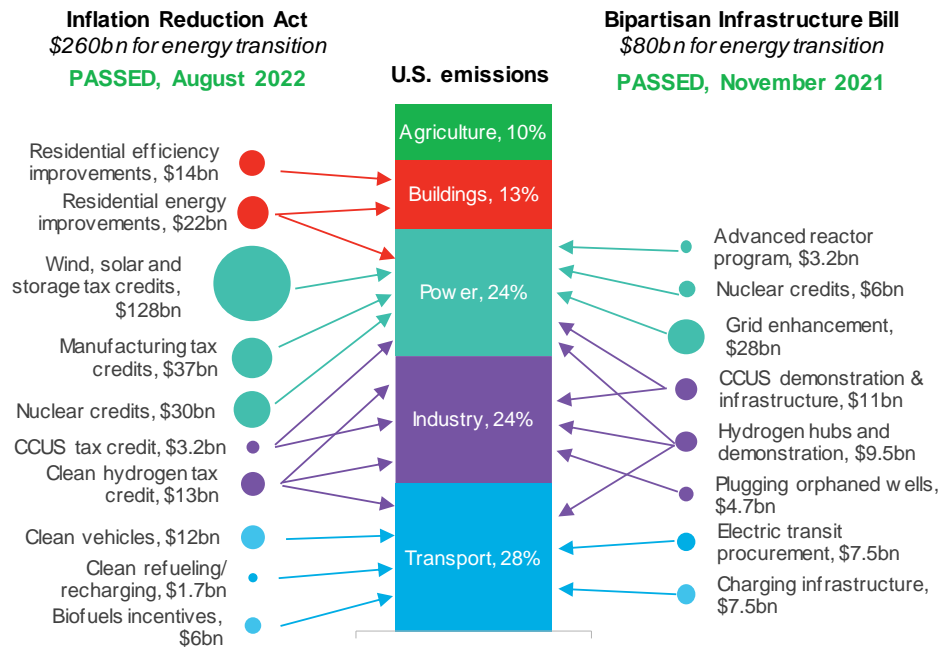


## US electricity generation, by fuel type



Source: EIA, BloombergNEF Note: Values for 2022 are projected, accounting for seasonality, based on latest monthly values from EIA (data available through October 2022)

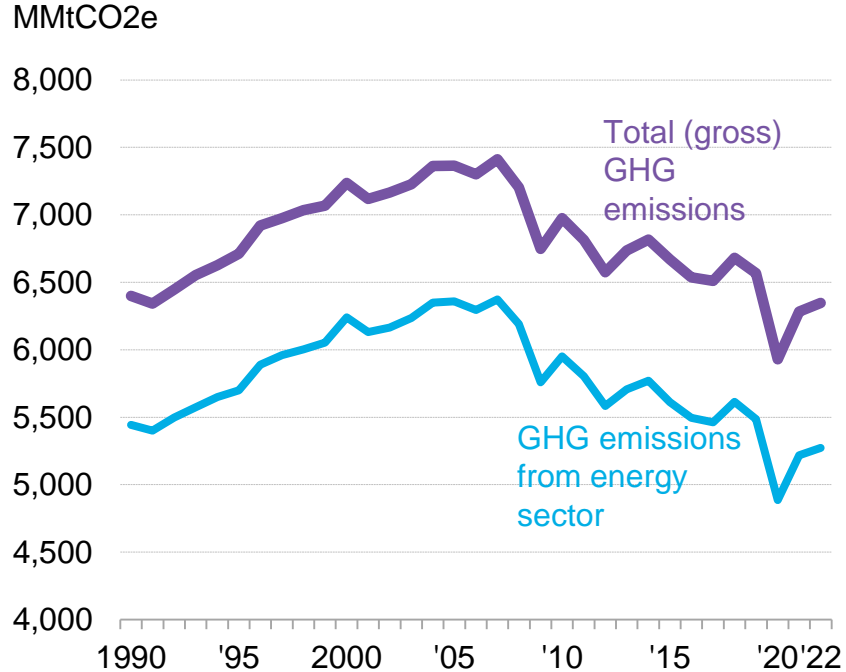
# Estimated 2022-31 energy transition spend in IRA and infrastructure law



Source: EIA, EPA, Joint Committee on Taxation, Inflation Reduction Act, BloombergNEF. Note: Left-hand chart only captures tax credits and incentives, not grant programs or loans.. CCUS is carbon capture, utilization and storage.

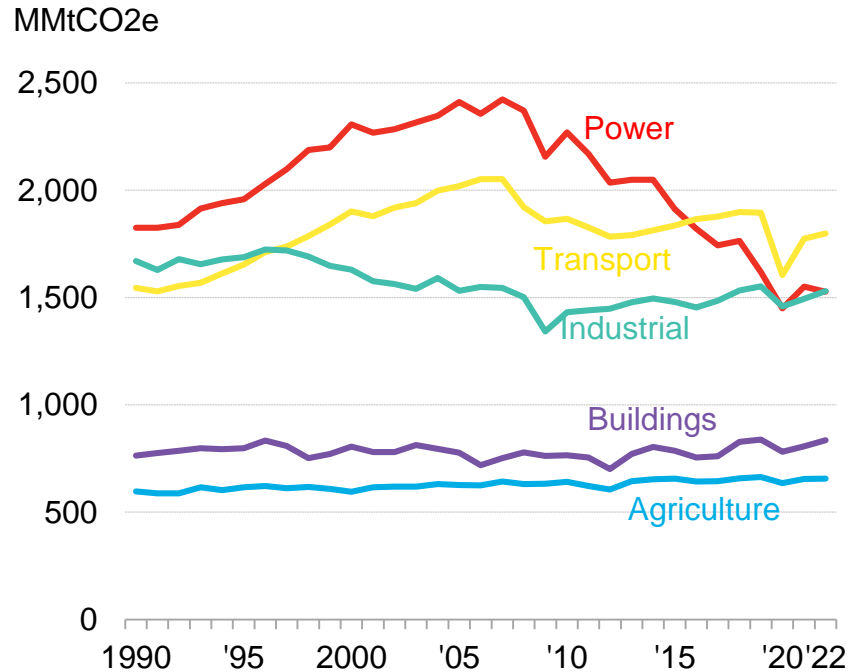
# US energy overview: Greenhouse gas (GHG) emissions

## Economy-wide and energy sector emissions



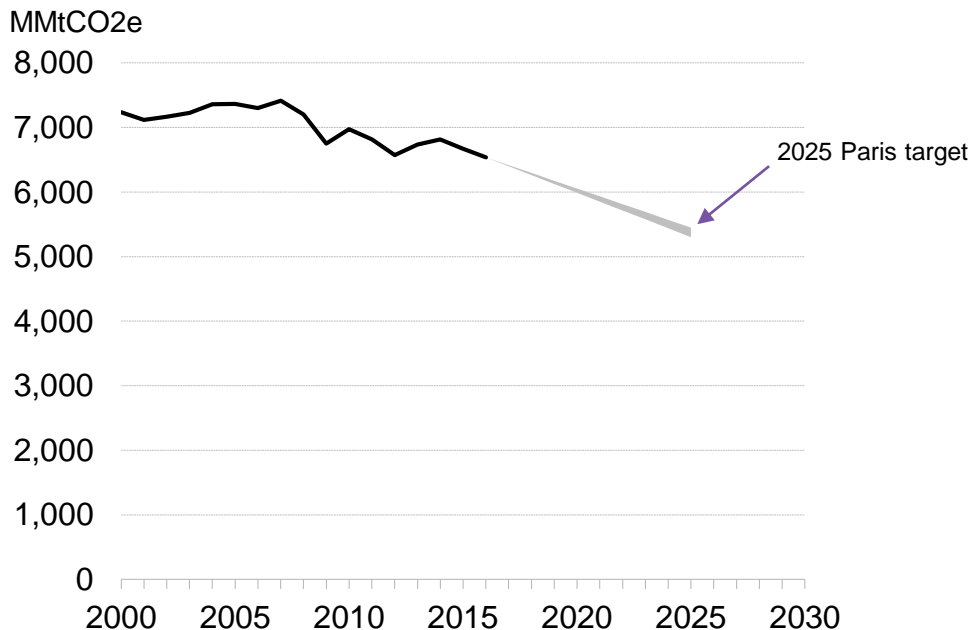
Source: BloombergNEF, EIA, EPA.

## Emissions by sector



# Policy: US progress toward emissions goals

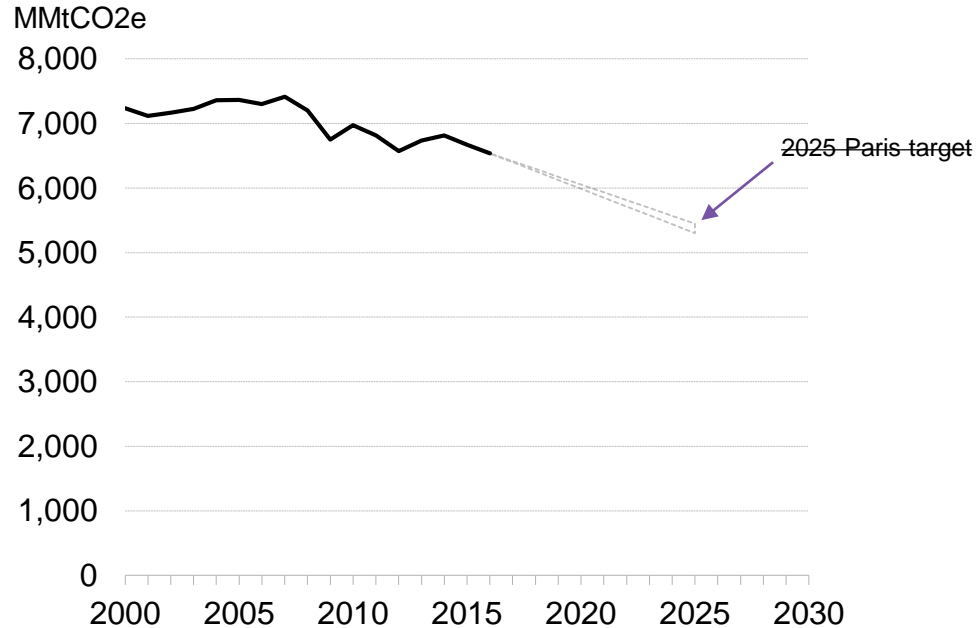
## US economy-wide emissions



Source: EIA, EPA, BloombergNEF

# Policy: US progress toward emissions goals

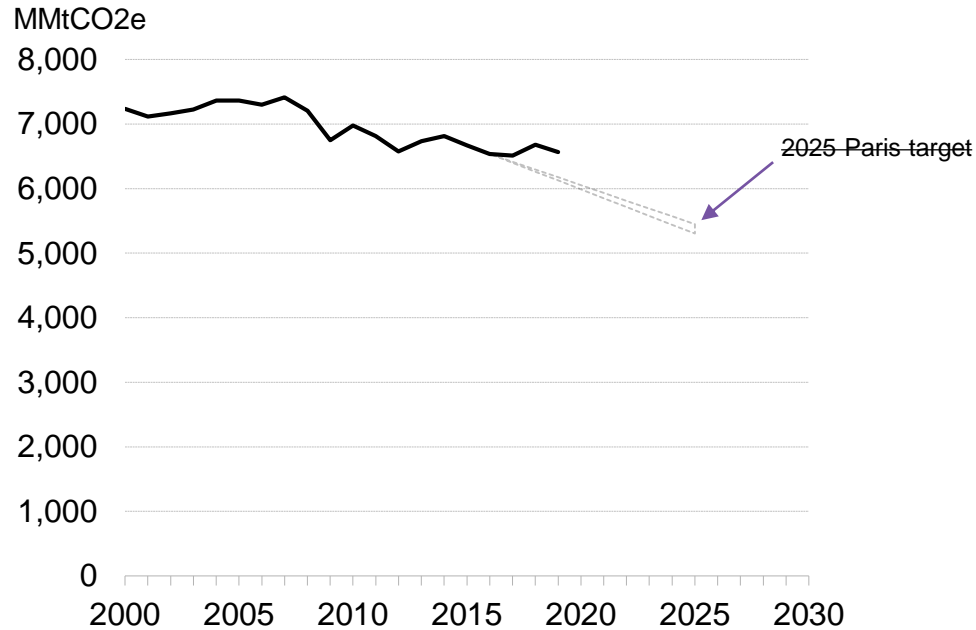
## US economy-wide emissions



Source: EIA, EPA, BloombergNEF

# Policy: US progress toward emissions goals

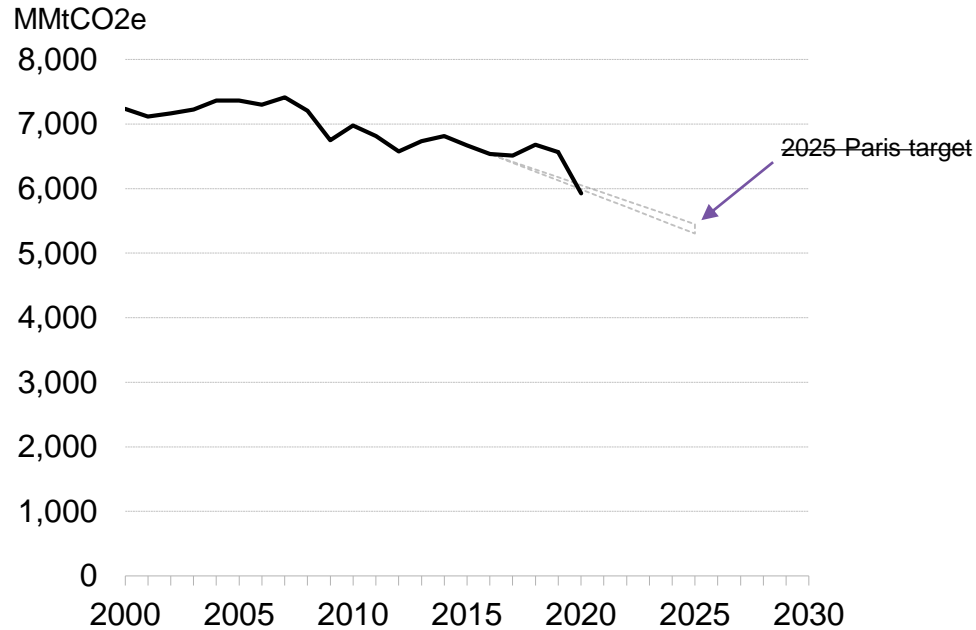
## US economy-wide emissions



Source: EIA, EPA, BloombergNEF

# Policy: US progress toward emissions goals

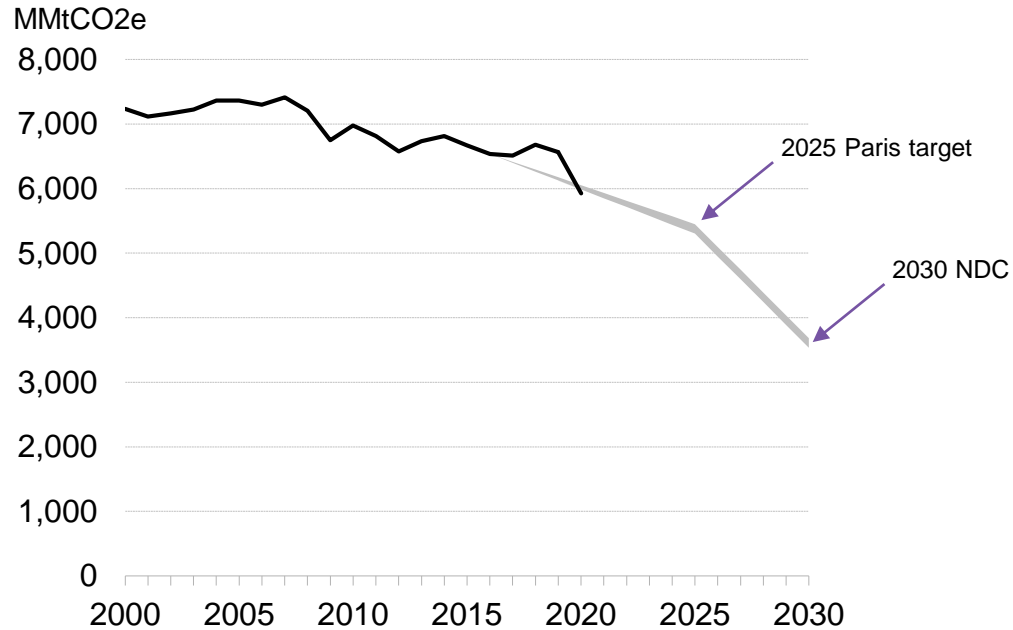
## US economy-wide emissions



Source: EIA, EPA, BloombergNEF

# Policy: US progress toward emissions goals

## US economy-wide emissions

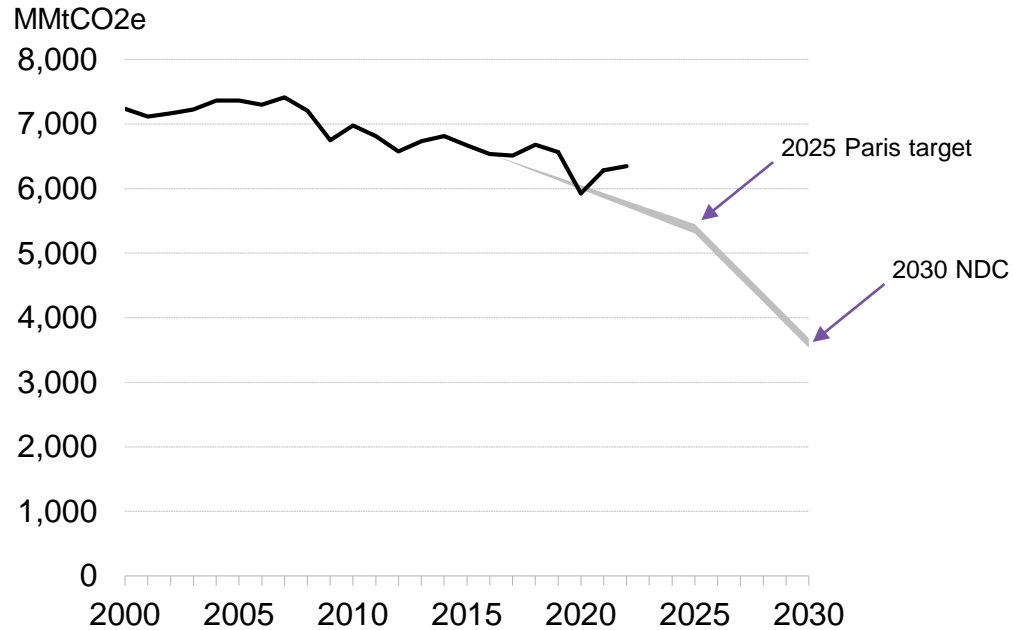


Source: EIA, EPA, BloombergNEF



# Policy: US progress toward emissions goals

## US economy-wide emissions



Source: EIA, EPA, BloombergNEF

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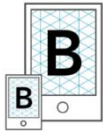
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# Sustainable Energy in America **2023 Factbook**

## Tracking Market & Policy Trends

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**BCSE supports** business development, networking, and knowledge exchange among its members and networks.

**BCSE provides** a credible, broad-based business coalition on clean energy market trends and policy impacts.



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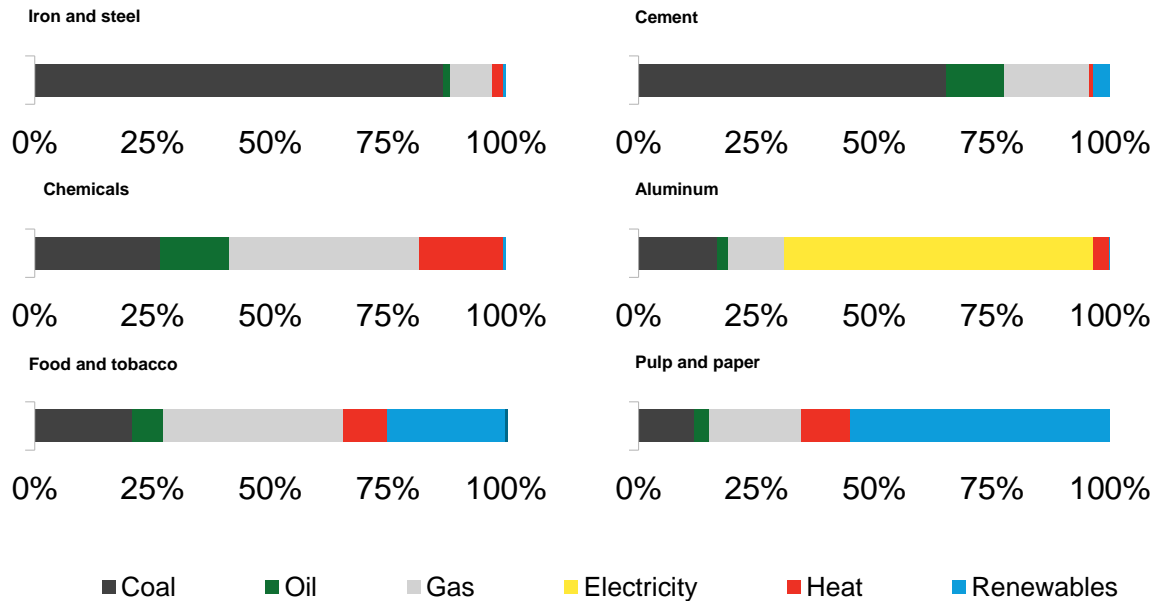


## Amy Farrell

Senior Vice President, Government  
and Public Affairs  
*CRES Forum*

# Deployment: The role of heat in industrial processes

## Share of energy supply for industrial process heat, 2018



Source: BloombergNEF, Marklines, US Department of Energy.



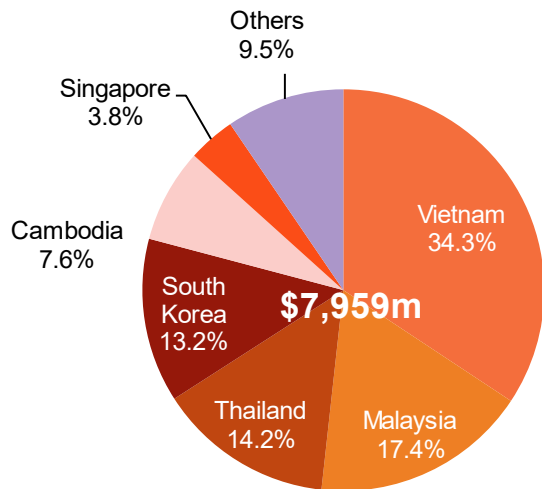


## Charles Bolden

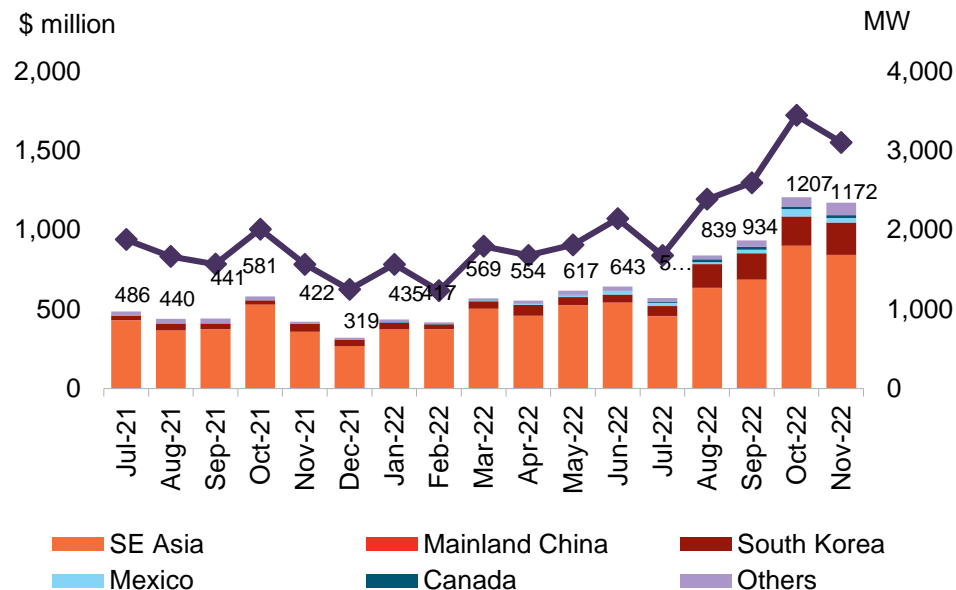
Senior Director, Congressional Affairs  
*Solar Energy Industries Association*

# Deployment: Solar imports

## US imports of PV modules by origin, January to November 2022



## US imports of PV modules, by month and origin



Source: BloombergNEF, Sinoimex. Note: Storage capacity uses two metrics: MW which signifies power output (based on the inverter capacity) and the MWh which specifies the energy storage capacity and relates to the duration the input/output can be sustained for (ie, a 10MW/40MWh system can sustain 10MW for 4 hours). The ITC is the federal investment tax credit.

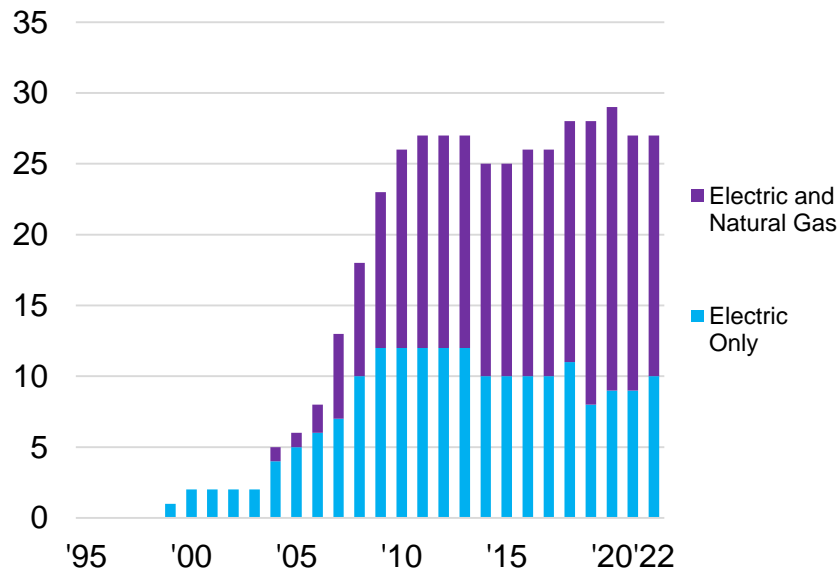


## Vincent Barnes

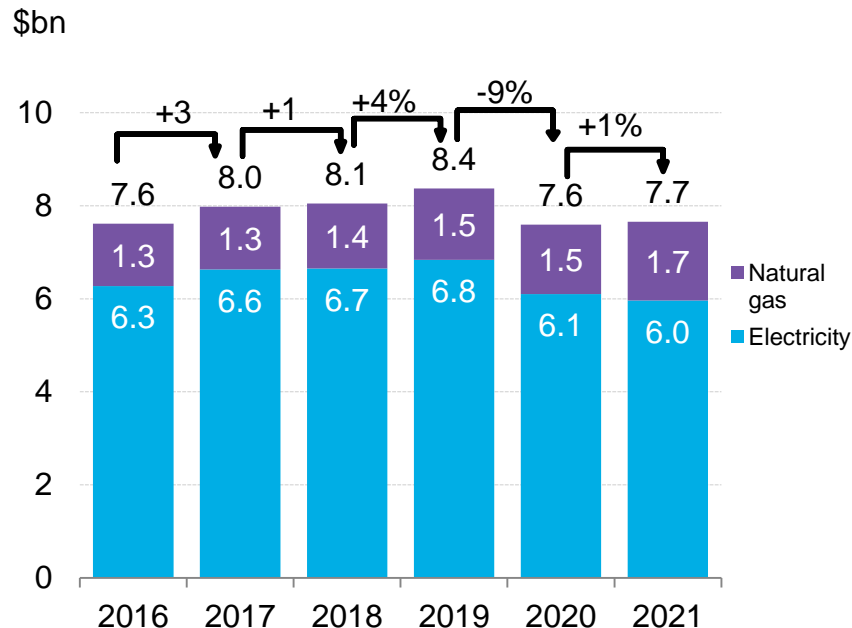
Senior Vice President, Policy and  
Research  
*Alliance to Save Energy*

# US energy overview: Energy efficiency

## US states with Energy Efficiency Resource Standards (EERS)



## Utility energy efficiency spending



Source: American Council for an Energy Efficient Economy (ACEEE) State Energy Efficiency Scorecard: 2022 Progress Report



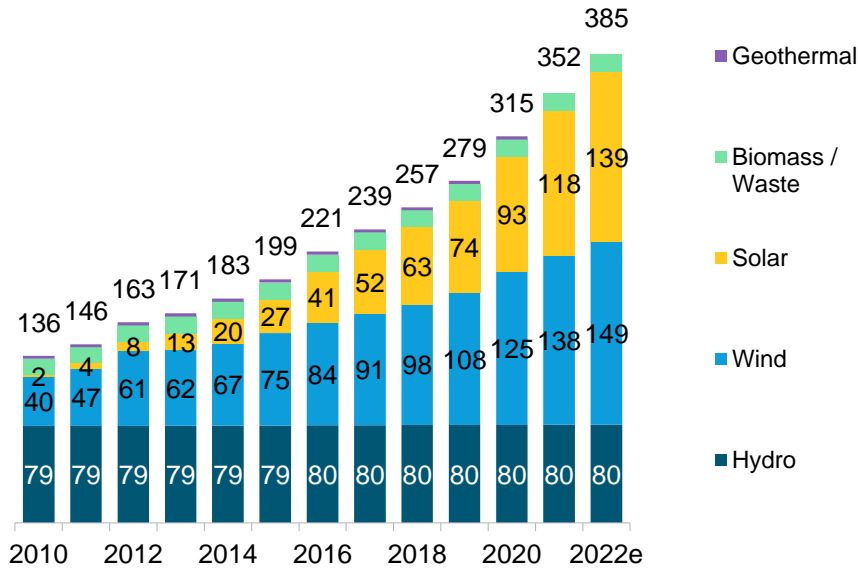
## **Billie Kaumaya**

Head of Federal Affairs  
*American Clean Power Association*

# US energy overview: Cumulative renewable energy

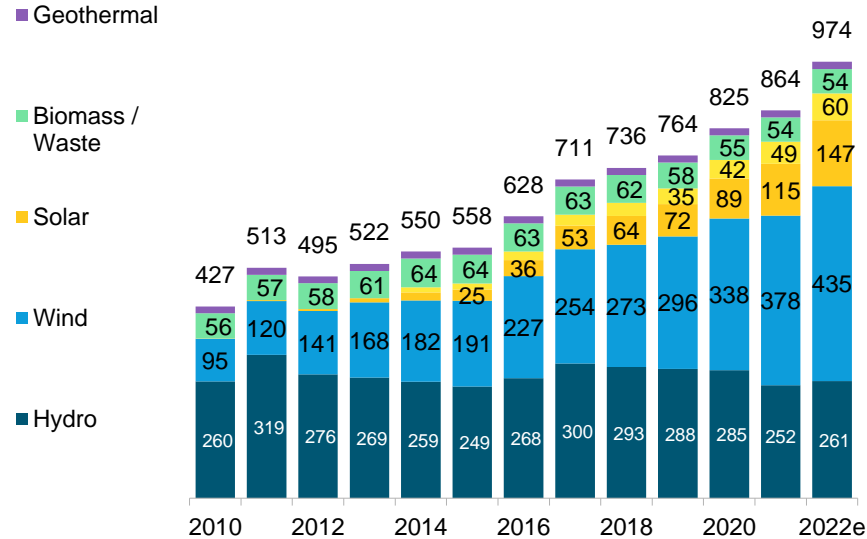
## US cumulative renewable capacity

GW



## US renewable generation by technology

TWh



Source: BloombergNEF, 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. Values for 2021 are projected, accounting for seasonality, based on latest monthly values from EIA (data available through October 2021)

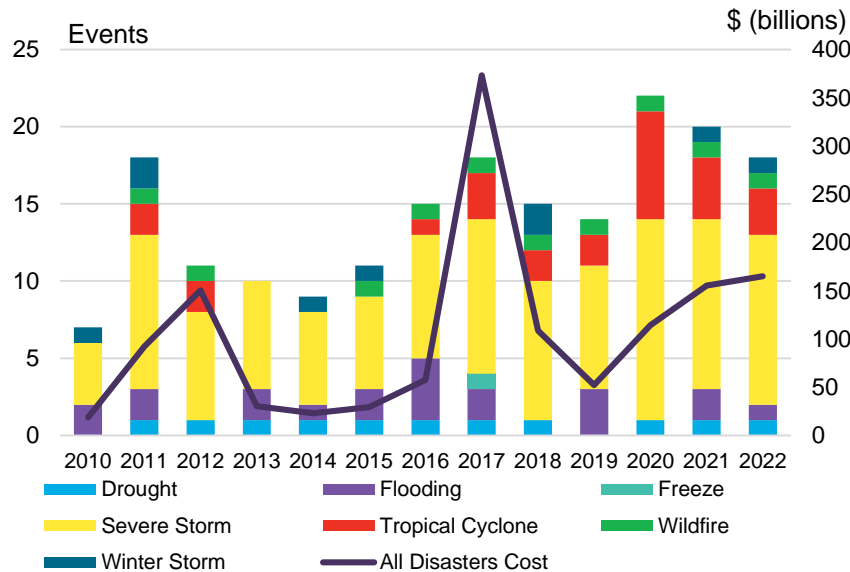


## Yvonne McIntyre

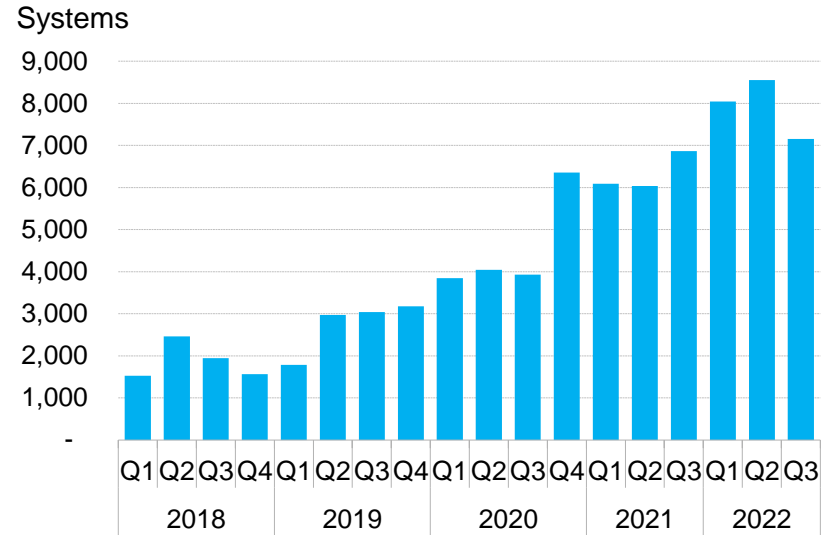
Vice President, Federal Affairs  
*Pacific Gas & Electric*

# Policy: Infrastructure and resilience

## US billion-dollar weather and climate disasters



## Quarterly residential energy storage systems installed in California



Source: National Oceanic and Atmospheric Administration, BloombergNEF. Note: Portrays annual counts of drought, flooding, freeze, severe storm, tropical cyclone, wildfire and winter storm events in the US with losses of more than \$1 billion each.



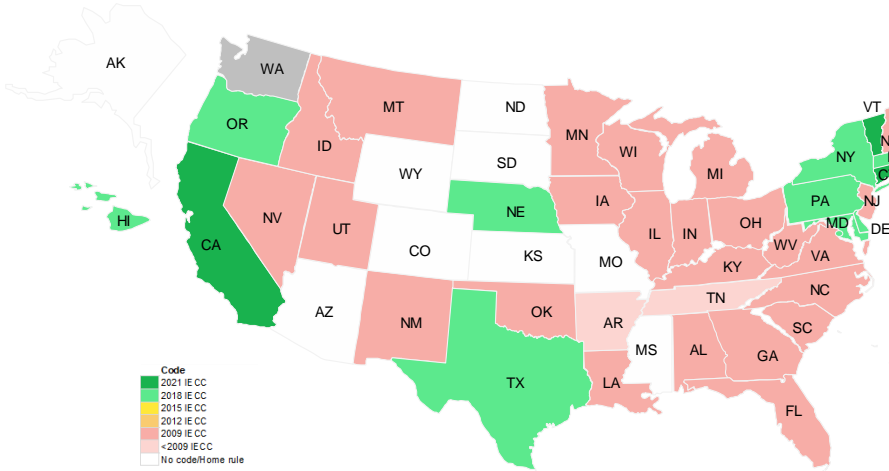


## Jennifer Kane

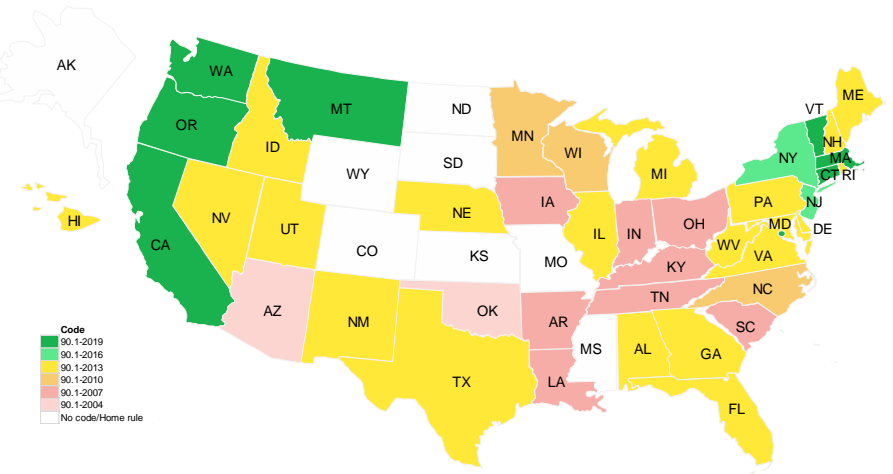
Energy Policy Leader  
*Trane Technologies*

# Deployment: Statewide energy code adoption

## Residential



## Commercial



Source: EERE, ACEEE, BloombergNEF. Note: The maps represent EERE analysis of energy savings impacts from state code adoptions. Any code for which the Energy Index is not more than 1% higher than that of an IECC or Standard 90.1 edition is considered equivalent to that code edition. For more on the EERE methodology see [link](#).



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Tracking Market & Policy Trends

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Wednesday, March 15, 2023