



Edison Electric  
INSTITUTE

# The Clean Energy Transformation





The Edison Electric Institute (EEI) is the association that represents all U.S. investor-owned electric companies. Our members provide electricity for 220 million Americans, and operate in all 50 states and the District of Columbia. As a whole, the electric power industry supports more than 7 million jobs in communities across the United States. In addition to our U.S. members, EEI has more than 60 international electric companies as International Members, and hundreds of industry suppliers and related organizations as Associate Members.

Organized in 1933, EEI provides public policy leadership, strategic business intelligence, and essential conferences and forums.

# ELECTRIC COMPANIES ARE Leading on Clean Energy



Changing U.S. Energy Mix

**>1/3**

CARBON-FREE



Increasing Investments

**\$110 Billion+**

PER YEAR IN SMARTER  
ENERGY INFRASTRUCTURE



**>1/2**

Over the Past Five Years,  
More Than Half of New Electricity  
Generation Capacity Was

WIND AND SOLAR



Expanding Access to EVs

**95,000+**

CHARGING STATIONS  
NATIONWIDE



Providing

**69%**

of the  
SOLAR ENERGY  
in the Country



Using

**90%+**

OF ALL  
U.S. ENERGY STORAGE

## Cutting Emissions

**CO<sub>2</sub> ↓ 27%**

BELOW 2005 LEVELS  
AS OF 2018

**NO<sub>x</sub> ↓ 84%**

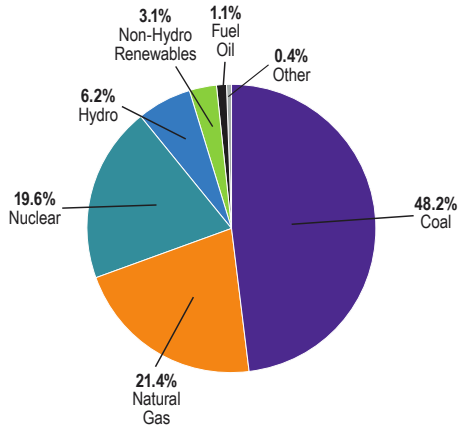
BETWEEN  
1990–2018

**SO<sub>2</sub> ↓ 92%**

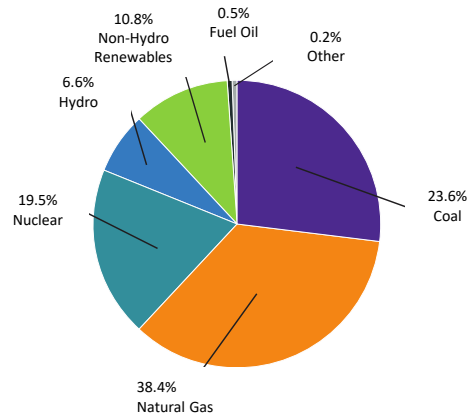
BETWEEN  
1990–2018

# Mix of Resources Used to Generate Electricity Has Changed Dramatically

## 2008 National Energy Resource Mix



## 2019 National Energy Resource Mix (Preliminary)



Source: U.S. Department of Energy, Energy Information Administration. Percentages reflect Megawatt hours.

2019 Preliminary includes data January-November

## REDUCING CARBON EMISSIONS SIGNIFICANTLY



### CARBON DIOXIDE EMISSIONS

↓27%

As of year-end 2018, our industry's carbon dioxide emissions were 27% below 2005 levels—nearly the lowest level in 3 decades.



### CARBON DIOXIDE EMISSIONS

↓50%

Based on projected trends and member goals, CO<sub>2</sub> emissions from EEI members are projected to be approximately 50% below 2005 levels by 2030.

# Promoting Electric Transportation

TODAY



There are more than  
**1.3 million**

electric vehicles on U.S. roads.



BY 2030



The number of  
EVs on the road is  
projected to reach

**18.7  
million.**



**~9.6  
million**

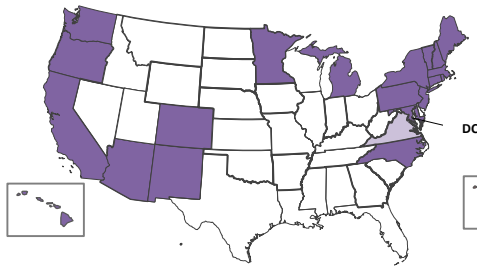
charge ports will be  
needed to support  
this number.

# Policy Trends

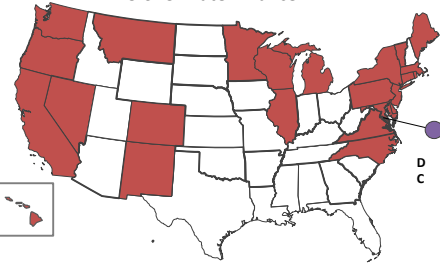
Cap-and-Trade Programs



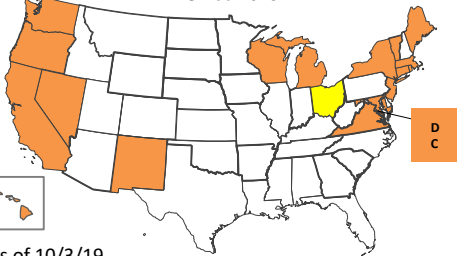
GHG Reduction Targets



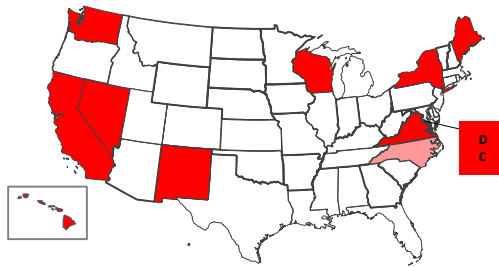
U.S. Climate Alliance



Renewable/Clean Portfolio Standard Changes Since 2015



100% Renewable/Clean Energy Targets



As of 10/3/19

## 2019 Was a Watershed Year for Clean Energy Commitments from U.S. States and Utilities

by Liz Stoltz and Tyler Cowger — December 23, 2019

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U.S. states and utilities made more ambitious clean energy commitments in 2019 than ever before, with many committing to reaching 50% or 100% clean energy in the coming decades.

Public concern about the current and future effects of climate change drove much of this action, making goal-setting a legislative priority for many governors. Utilities are also increasingly committing to slash fossil fuel generation and transition to zero-carbon electricity production in the



Designated Area, Photo by Steve Wilson/Wikimedia Commons



REPORT BLOG | SOPHIA PACEK & SHERRI GARDIN

## More Utilities Make Big Commitments to Climate Action

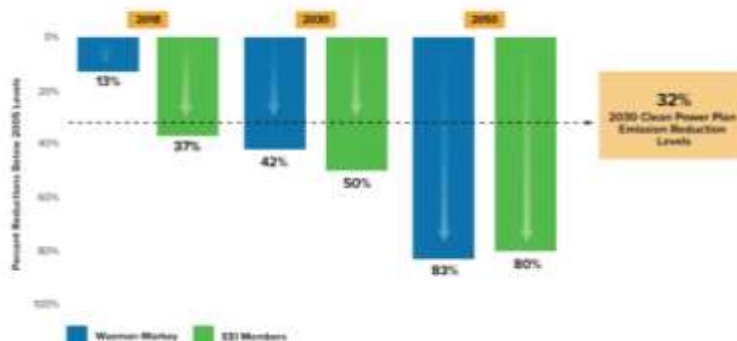
March 22, 2020 — Sophia Pacek & Sherry Gardin



Utility clean energy commitments have strengthened and multiplied since an *unprecedented* state of the most noteworthy announcements last year. *Just Energy* recently became the first major utility to commit to eliminating 100 percent of its carbon emissions by 2030. *Public Power Finance Authority*, a publicly owned utility in Colorado, announced its pledge to provide 100 percent carbon-free energy by 2030. And *MidAmerican Energy*, a Burlington, Vermont utility, will be the first U.S. utility to provide customers with electricity generated from 100 percent renewable energy by 2020, less than a year away.

When President Trump proposed to roll back the *Clean Power Plan* to cut power plant emissions and replace it with the *Ways and Means* plan, the outgoing administration only. *The Affordable Clean Energy* rule, and then *renewed emissions standards* for new coal-fired power plants, there were concerns that the new rule would not only benefit coal companies, but also make electric power providers both less willing to clean energy. So far—what we've seen has been a series of strong statements—that has not been the case. These commitments from utilities to reduce carbon pollution and invest in clean energy keep coming despite a strong push by the Trump

## Clean Energy Milestones

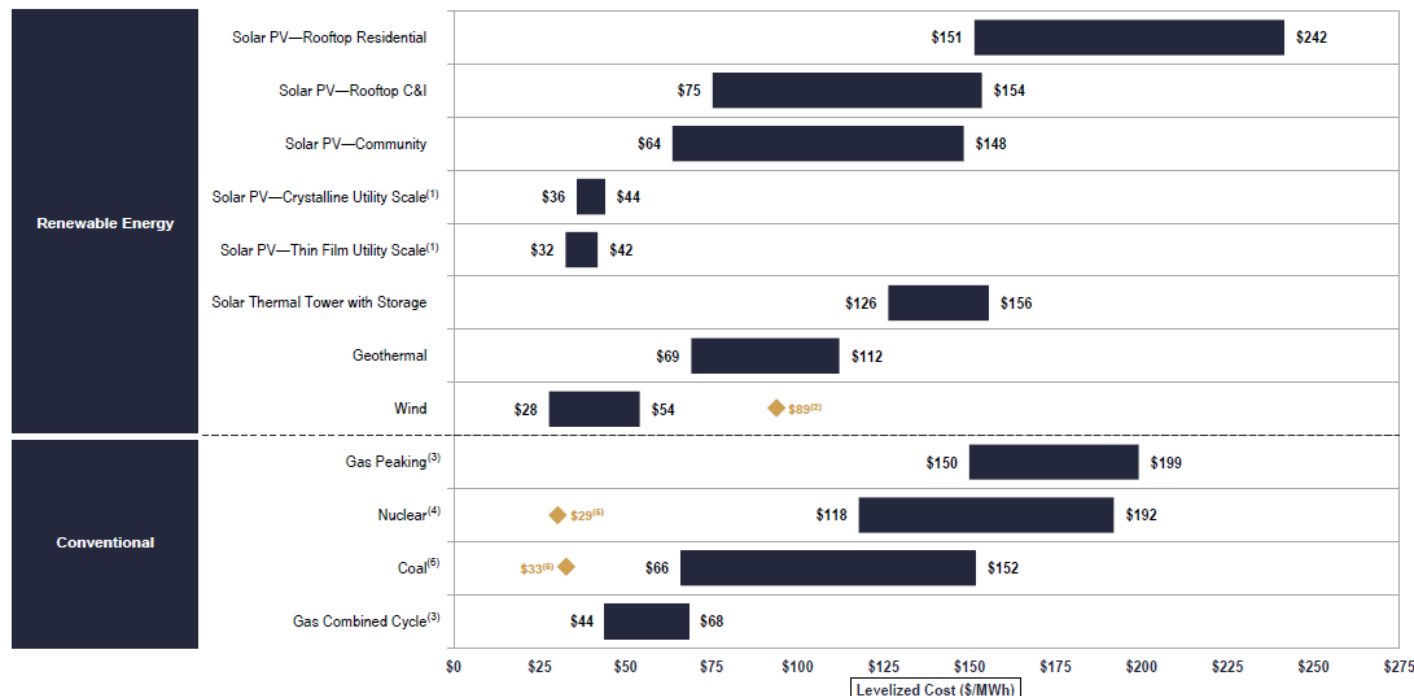


Source: American Clean Energy and Security Act (H.R. 2606) of the 111th Congress (2009); Environmental Protection Agency (EPA) Clean Power Plan (2015); EEI data based on 22 members of EEI's membership from 480 utility firms.



# Levelized Cost of Energy Comparison—Unsubsidized Analysis

Selected renewable energy generation technologies are cost-competitive with conventional generation technologies under certain circumstances



Source: Lazard estimates.

Note: Here and throughout this presentation, unless otherwise indicated, the analysis assumes 60% debt at 8% interest rate and 40% equity at 12% cost. Please see page titled "Levelized Cost of Energy Comparison—Sensitivity to Cost of Capital" for cost of capital sensitivities. These results are not intended to represent any particular geography. Please see page titled "Solar PV versus Gas Peaking and Wind versus COGT—Global Markets" for regional sensitivities to selected technologies.

(1) Unless otherwise indicated herein, the low end represents a single-axis tracking system and the high end represents a fixed-tilt system.

(2) Represents the estimated implied midpoint of the LCOE of offshore wind, assuming a capital cost range of approximately \$2.33 – \$3.53 per watt.

(3) The fuel cost assumption for Lazard's global, unsubsidized analysis for gas-fired generation resources is \$3.45/MMBTU.

(4) Unless otherwise indicated, the analysis herein does not reflect decommissioning costs, ongoing maintenance-related capital expenditures or the potential economic impacts of federal loan guarantees or other subsidies.

(5) Represents the midpoint of the marginal cost of operating coal and nuclear facilities, inclusive of decommissioning costs for nuclear facilities. Analysis assumes that the salvage value for a decommissioned coal plant is equivalent to its decommissioning and site restoration costs. Inputs are derived from a benchmark of operating coal and nuclear assets across the U.S. Capacity factors, fuel and variable and fixed operating expenses are based on upper and lower quartile estimates derived from Lazard's research. Please see page titled "Levelized Cost of Energy Comparison—Renewable Energy versus Marginal Cost of Selected Existing Conventional Generation" for additional details.

(6) High end incorporates 90% carbon capture and compression. Does not include cost of transportation and storage.

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# The Path Forward

To ensure that the clean energy transformation reaches its full potential, public policies should put customers first, focus on outcomes, support progress, and accelerate innovation. And, policymakers should:

- **Increase research and development funding and support for the range of technologies** needed to achieve clean energy goals, including energy efficiency, energy storage, renewables, existing and next-generation nuclear, other carbon-free technologies, and carbon capture utilization and storage.
- **Help to electrify the transportation sector**—recognizing that transportation emissions now are the largest source of emissions in the United States—by modernizing federal transportation programs to encourage investments in electric transportation and charging infrastructure. Transportation electrification provides an opportunity to leverage the reductions in power sector emissions to achieve reductions in transportation sector emissions.
- **Support ongoing investments in the energy grid**, which are necessary to increase cost-effective electrification and to integrate advanced clean energy technologies reliably and affordably.
- **Encourage the development of more robust battery technologies** for both electric vehicles and energy storage.

With the right policies in place, electric companies can further reduce their emissions, help dramatically reduce the most significant emissions from other industries, and deliver the clean energy future that Americans want and expect.

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