

# Renewable Energy Policy in the United States

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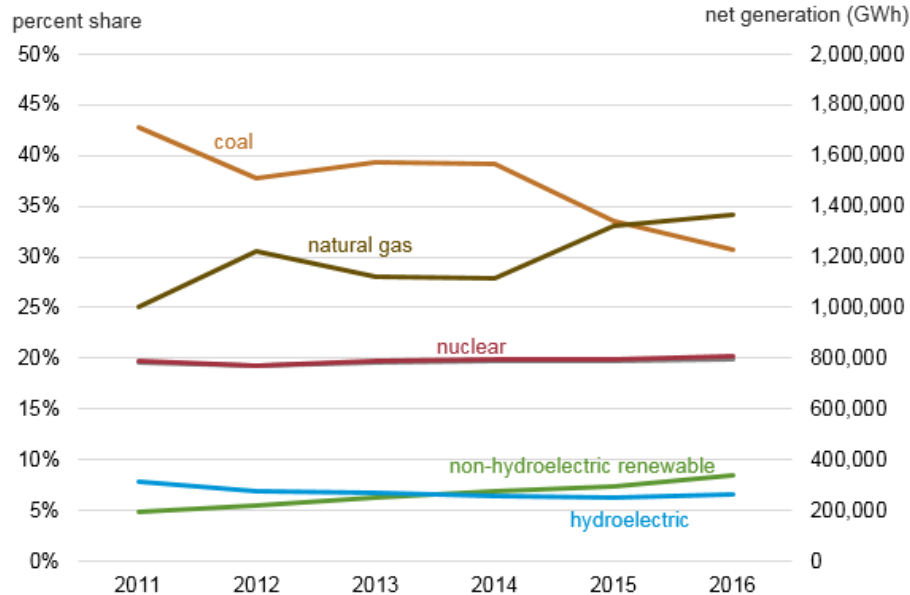


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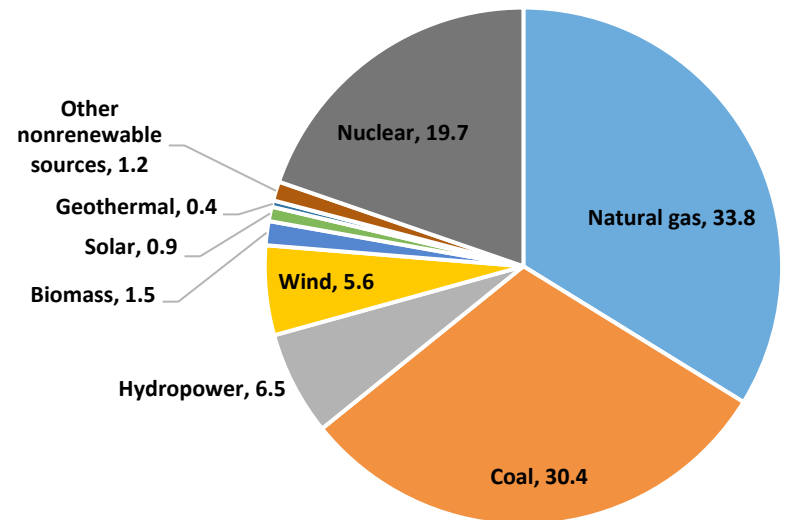
# U.S. Electricity Generation by Source

U.S. generation and generation share by energy source, 2011-16



U.S. Energy Information Administration (EIA) (2017a).  
Note: Data for 2016 are preliminary.

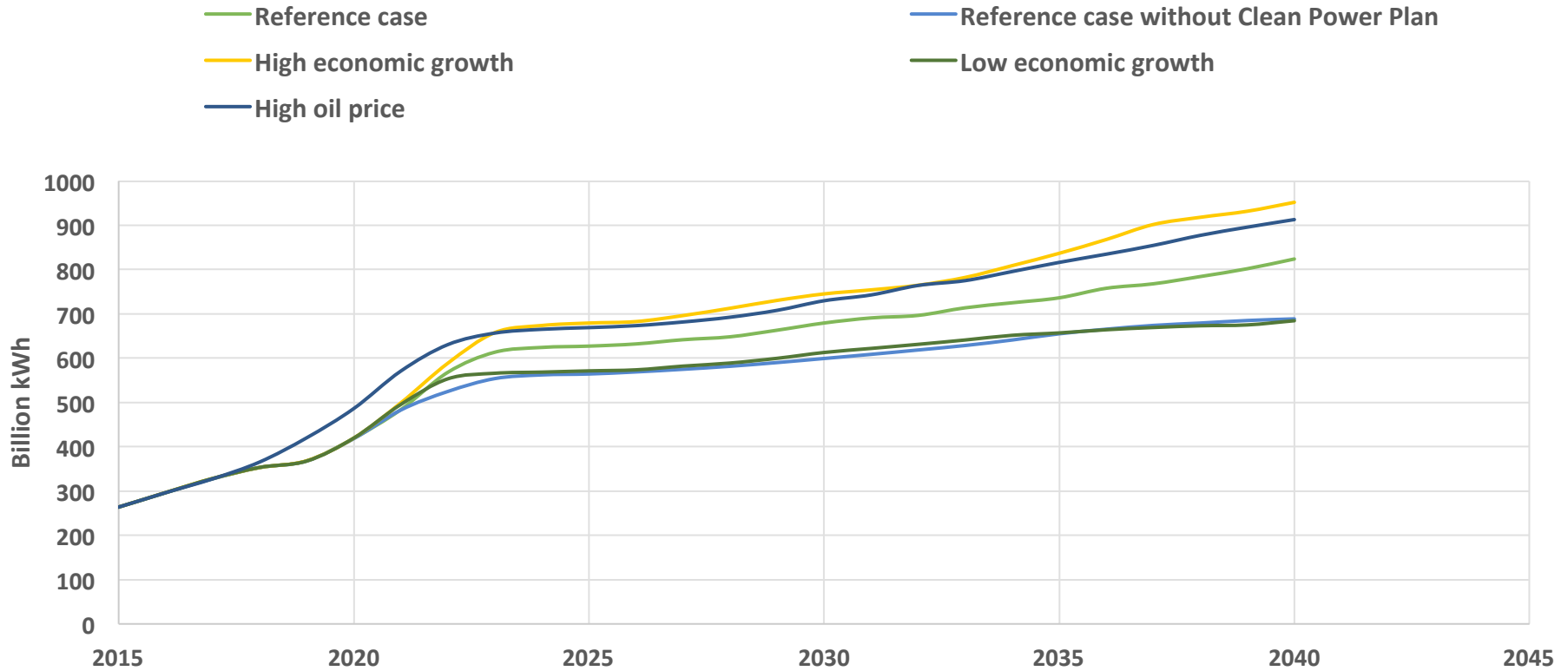
U.S. Annual Electricity Generation by Source, 2016



U.S. Energy Information Administration (EIA) (2017b).

# Projected Non-Hydro RE Generation

Projected non-hydro RE generation after 2015 under various scenarios



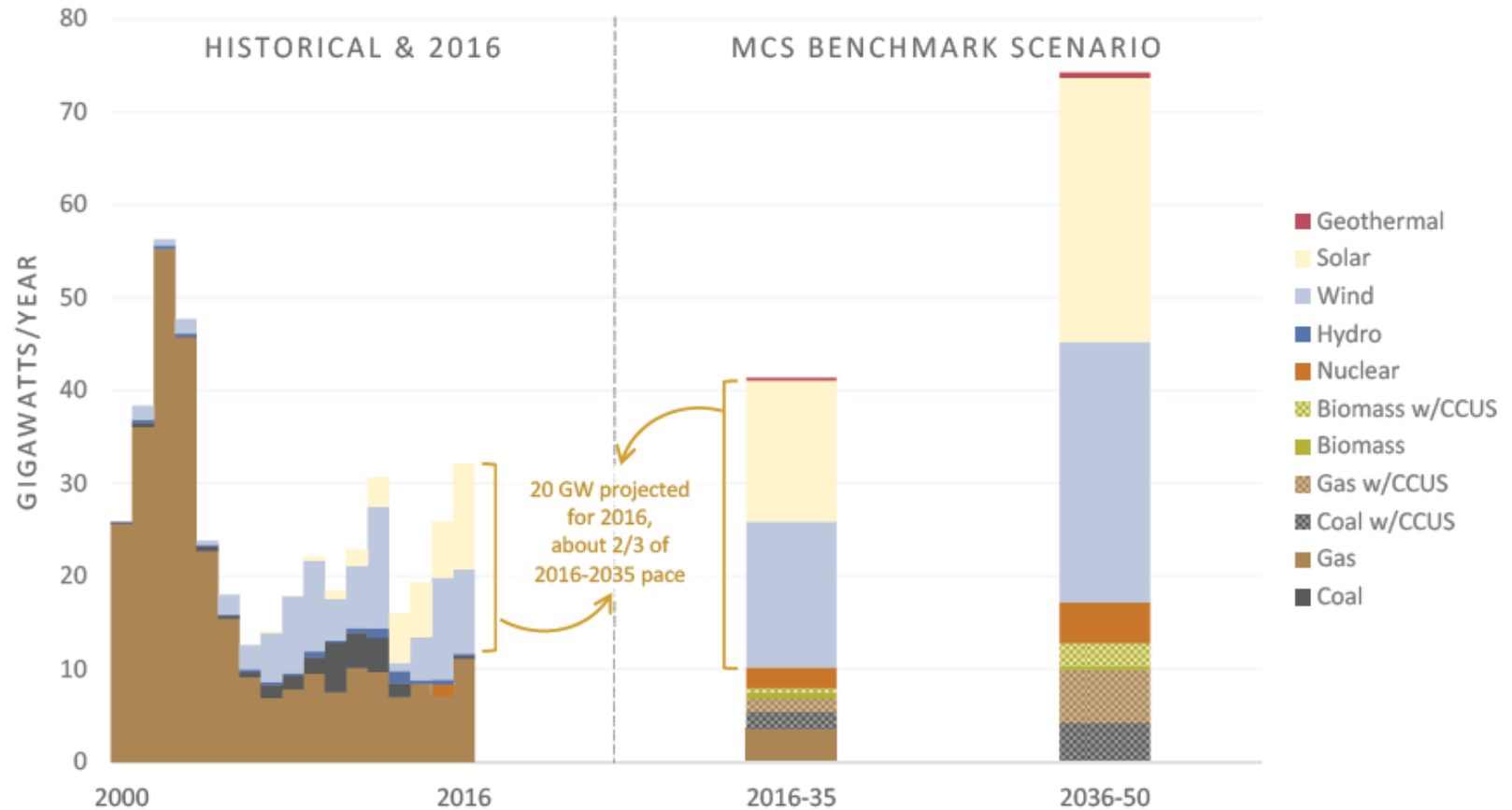
U.S. Energy Information Administration (EIA) (2017c).



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# U.S. RE Deployment Potential

**FIGURE E2: AVERAGE ANNUAL CAPACITY ADDITIONS BY FUEL, HISTORICAL AND MCS BENCHMARK SCENARIO**



The White House of President Barack Obama (2016).



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# Subsidies – Renewable Tax Credits

- December 2015: Congress approved 5 year extensions to
- 30 percent solar investment tax credit (ITC)
- 2.3 c/kWh wind production tax credit (PTC)
  - Expired and extended multiple times since 1998
- Both ITC and PTC phased down gradually

# Subsidies – Renewable Tax Credits

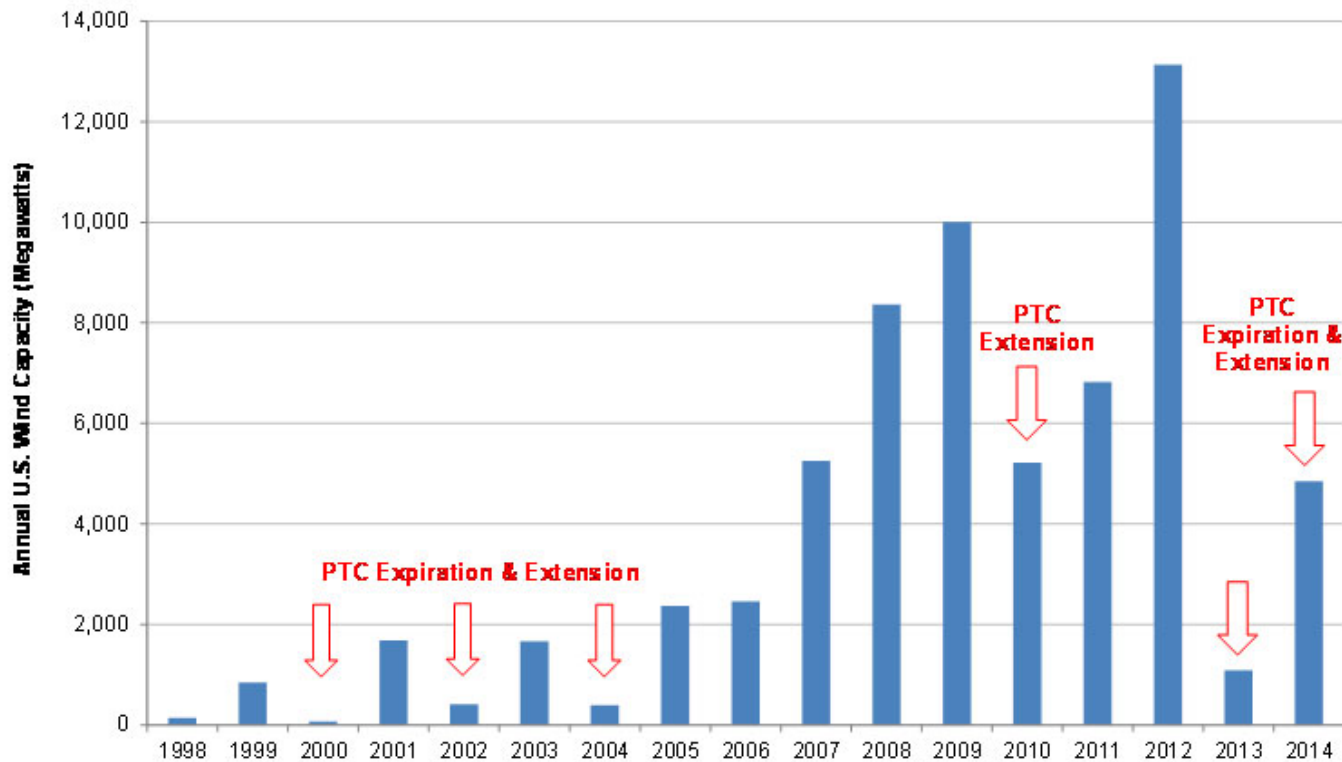
**Table 1. Schedule of Wind and Solar Tax Credits Prior to and After the *Consolidated Appropriations Act of 2016***

New Policy		2015	2016	2017	2018	2019	2020	2021	Future
<b>Wind PTC</b>		Full	Full	80%	60%	40%	0%	0%	0%
<b>Solar ITC</b>	Utility	30%	30%	30%	30%	30%	26%	22%	10%
	Commercial/Third-Party-Owned	30%	30%	30%	30%	30%	26%	22%	10%
	Residential Host-Owned	30%	30%	30%	30%	30%	26%	22%	0%
Prior Policy		2015	2016	2017	2018	2019	2020	2021	2022
<b>Wind PTC</b>		0%	0%	0%	0%	0%	0%	0%	0%
<b>Solar ITC</b>	Utility	30%	30%	10%	10%	10%	10%	10%	10%
	Commercial/Third-Party-Owned	30%	30%	10%	10%	10%	10%	10%	10%
	Residential Host-Owned	30%	30%	0%	0%	0%	0%	0%	0%

The New Policy schedules reflect “commenced-construction” dates for all categories except Solar ITC Residential Host-Owned for which “placed-in-service” dates are shown. The Prior Policy schedules reflect “placed-in-service” dates for all categories except or the Wind PTC which had a “commenced-construction” deadline of December 31, 2014. The “Full” (100%) wind PTC value is 2.3¢/kWh for electricity production over the first ten years.

# Wind Production Tax Credit – Fluctuation

Impact of Production Tax Credit Expiration and Extension on U.S. Annual Installed Wind Capacity



Sources: Compiled by UCS based on data from DOE 2014 and AWEA 2015

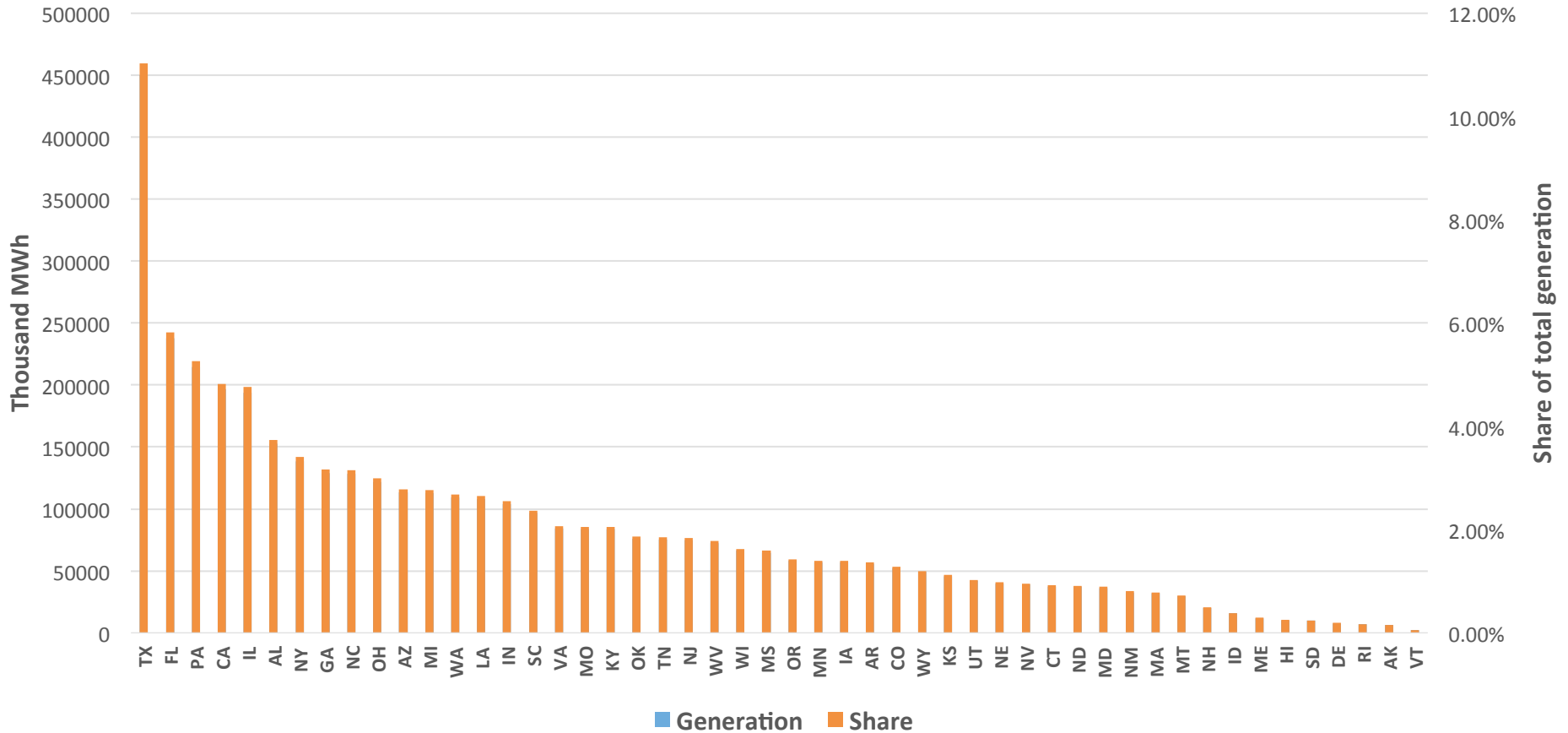
Union of Concerned Scientists (UCS).



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# Electricity Generation by State

U.S. State-Wise Energy Generation and Share, 2015



U.S. Energy Information Administration (EIA) (2017d).

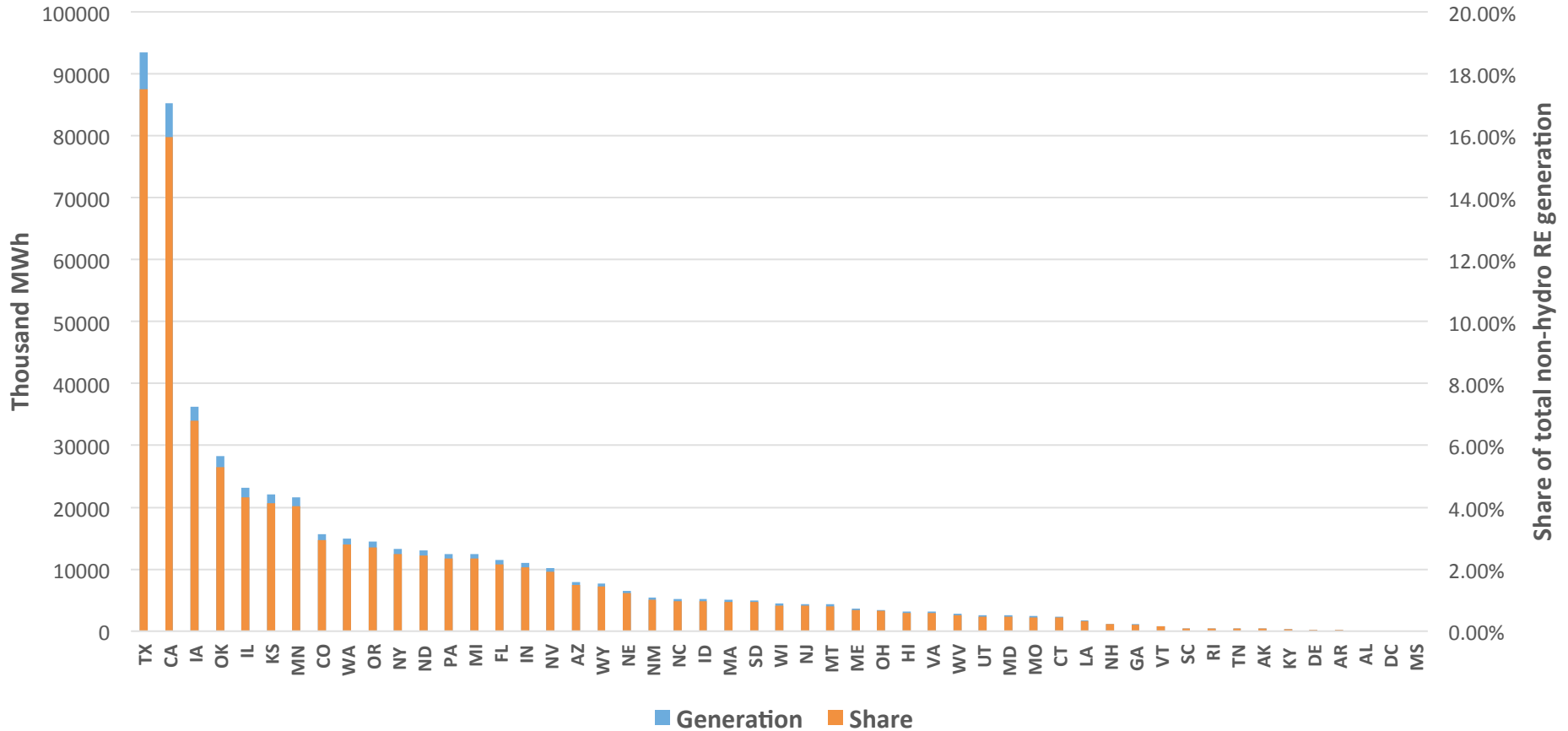


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# Non-Hydro RE Generation by State

U.S. State-Wise Non-Hydro Renewable Electricity Generation and Share, 2015



U.S. Energy Information Administration (EIA) (2017e).



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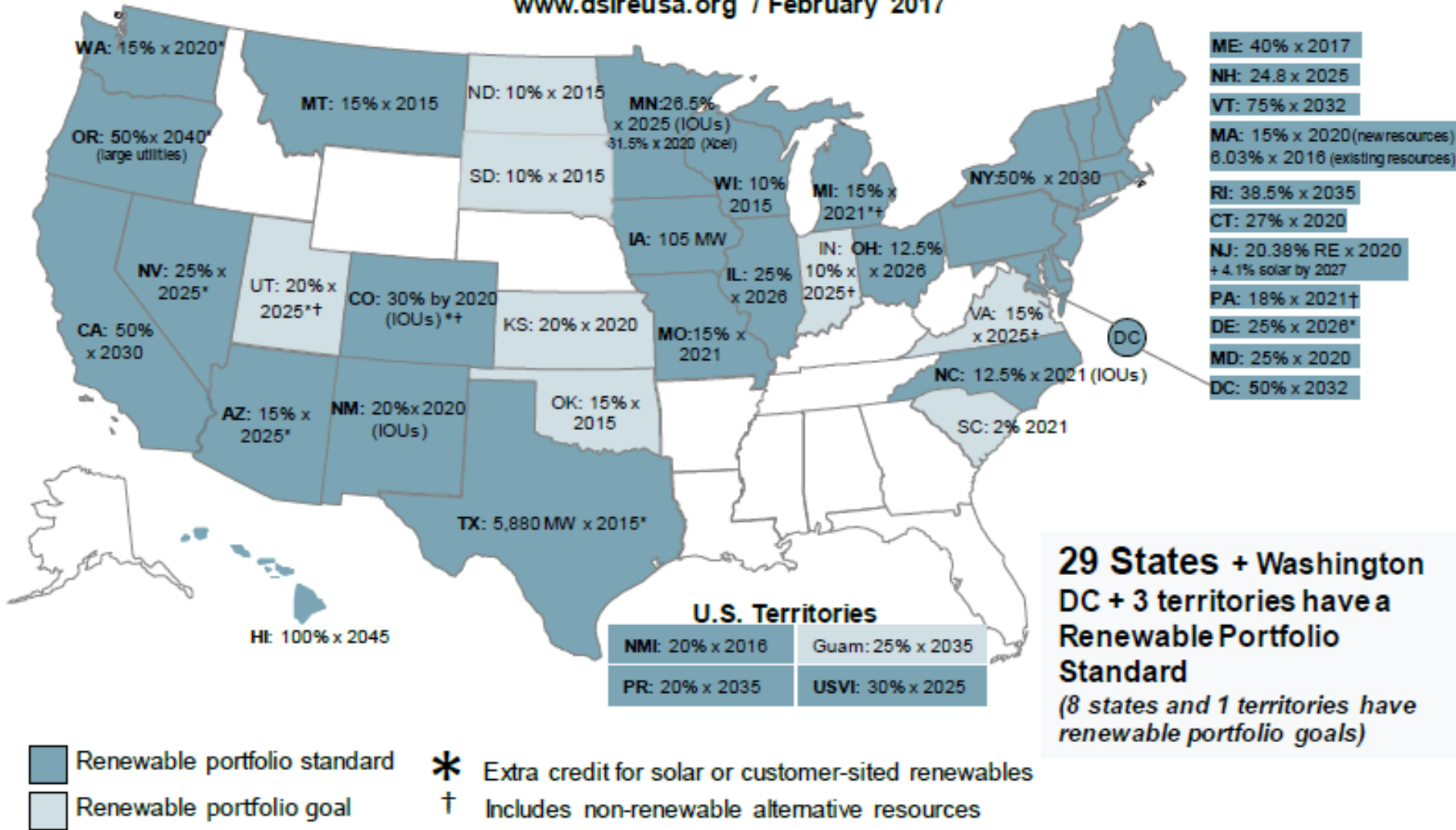
# State Renewable Portfolio Standards (RPS)

- Renewable Portfolio Standards (RPS) require utilities to sell a specified percentage or amount of renewable electricity
- 29 states currently have a RPS in place, ambition varies widely
  - CA, NY: 50% by 2030 vs.
  - AZ: 15% by 2025
- 8 states have voluntary renewable energy goals in place
- Total state policies/ incentives for renewables & efficiency
  - CA: 246 different policies in place vs.
  - WV: 15 policies in place



# Renewable Portfolio Standard Policies

www.dsireusa.org / February 2017



**29 States + Washington DC + 3 territories have a Renewable Portfolio Standard**  
*(8 states and 1 territories have renewable portfolio goals)*

Database of State Incentives for Renewable Energy (DSIRE) (2017a).



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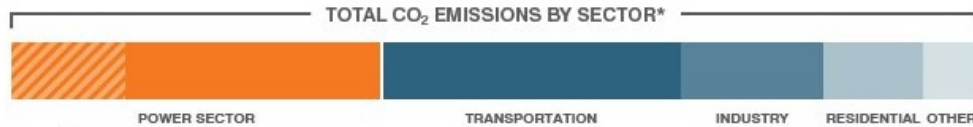
# Clean Power Plan (CPP)

- Rule regulating CO<sub>2</sub> emissions from U.S. power plants
  - Finalized in August 2015
- Establishes CO<sub>2</sub> emissions goals for each U.S. state
  - States have flexibility in designing & implementing plans to meet goals
- CO<sub>2</sub> emissions goals are structured in three ways:
  - rate-based: pounds of CO<sub>2</sub> emitted per MWh of electricity generation
  - mass-based: total short tons of CO<sub>2</sub> emitted across state power plants
  - mass-based: additional considerations for new generation sources
- Goals established for both an “interim period” (three stages: 2022-2024, 2025-2027, 2028-2029) and a final goal for 2030 and beyond

# Clean Power Plan – Expected Impacts

## The U.S. Clean Power Plan

### 2030 IMPACT: BY THE NUMBERS



**32%** reduction in power sector emissions by 2030\*

**30%** more renewable energy by 2030

\*2005 BASELINE

### ECONOMIC STRENGTHS



\$155 billion in consumer savings between 2020-2030



\$1 invested in clean energy creates 3x as many jobs as \$1 invested in fossil fuels



Tens of thousands of renewable energy jobs added by 2040



### HEALTH BENEFITS

UP TO **\$54 BILLION** in public health and climate benefits

UP TO **90,000** childhood asthma attacks prevented

UP TO **3,600** premature deaths avoided in 2030 due to cleaner air

# Clean Power Plan – Status

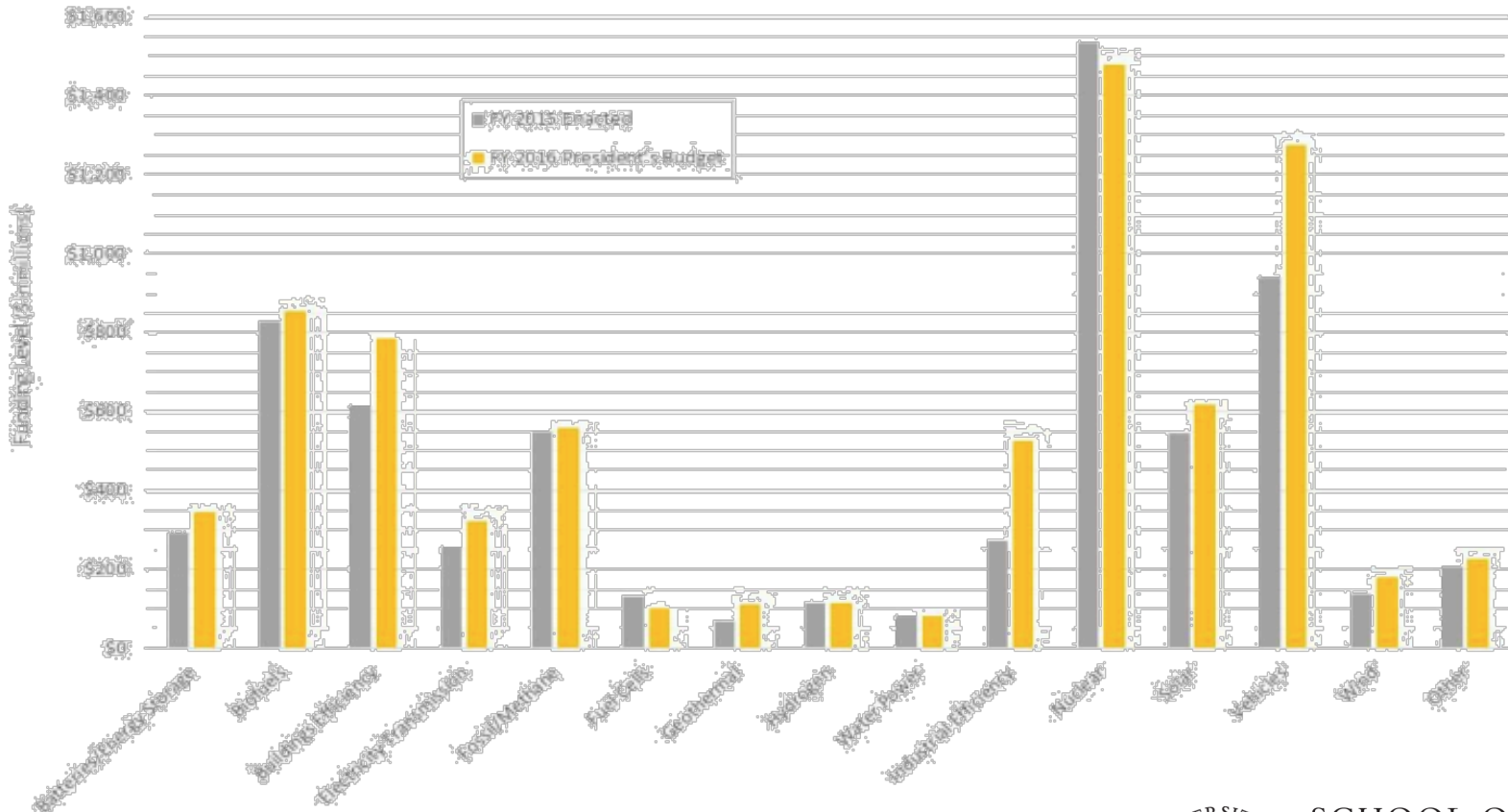
- February 9, 2016: U.S. the Supreme Court granted a stay of CPP implementation until legal challenges were resolved
- March 28, 2017: President Trump signs Executive Order on Energy Independence
  - Calls for reconsideration of CPP
- April 4, 2017: U.S. Environmental Protection Agency (EPA) announces CPP review which could result in action to suspend, revise or rescind the CPP
- April 28, 2017: U.S. Court of Appeals (DC Circuit) granted Trump administration motion to pause case for 60 days

# President Trump – Policy Overview

- **Current Actions**
  - Ordered review of CPP
  - Rolled back “Stream Protection Rule”
  - Ordered review of the “Waters of the United States” (WOTUS) rule
  - Pushed forward construction of Keystone XL, Dakota Access pipelines
- **Potential Actions**
  - Pull U.S. out of Paris Agreement, or alter U.S. NDC target
- **Difficult to Change**
  - Solar ITC and wind PTC (passed Congress with bipartisan support)
  - Permanently avoiding regulation of CO<sub>2</sub> emissions from power plants
    - required based on 2009 GHG “endangerment finding”

# Clean Energy R&D Support

**Figure 1**  
**Government-Wide Funding for Clean Energy Technology Research, Development, Demonstration and Deployment**



Office of Management and Budget (2015).



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# President Trump – Clean Energy R&D

- Decrease in R&D funding
  - Proposed FY 2018 “America First” budget decreases overall DOE funding by 5.6% to \$28 billion
    - includes an increase of 11.3% for Nuclear Security Administration but
    - decrease of 17.9% for other energy
  - \$900 million cut for Office of Sciences ~ 20% reduction
  - \$5.8 billion cut for NIH ~ 18% reduction
  - Completely eliminates ARPA-E funding of \$300 million
- Mission Innovation:
  - 22 countries and EU to double R&D spending in 5 years
  - Obama administration: FY 2017 budget request proposed \$5.85 billion in discretionary funding for clean energy R&D at DOE
    - 21% increase from FY 2016

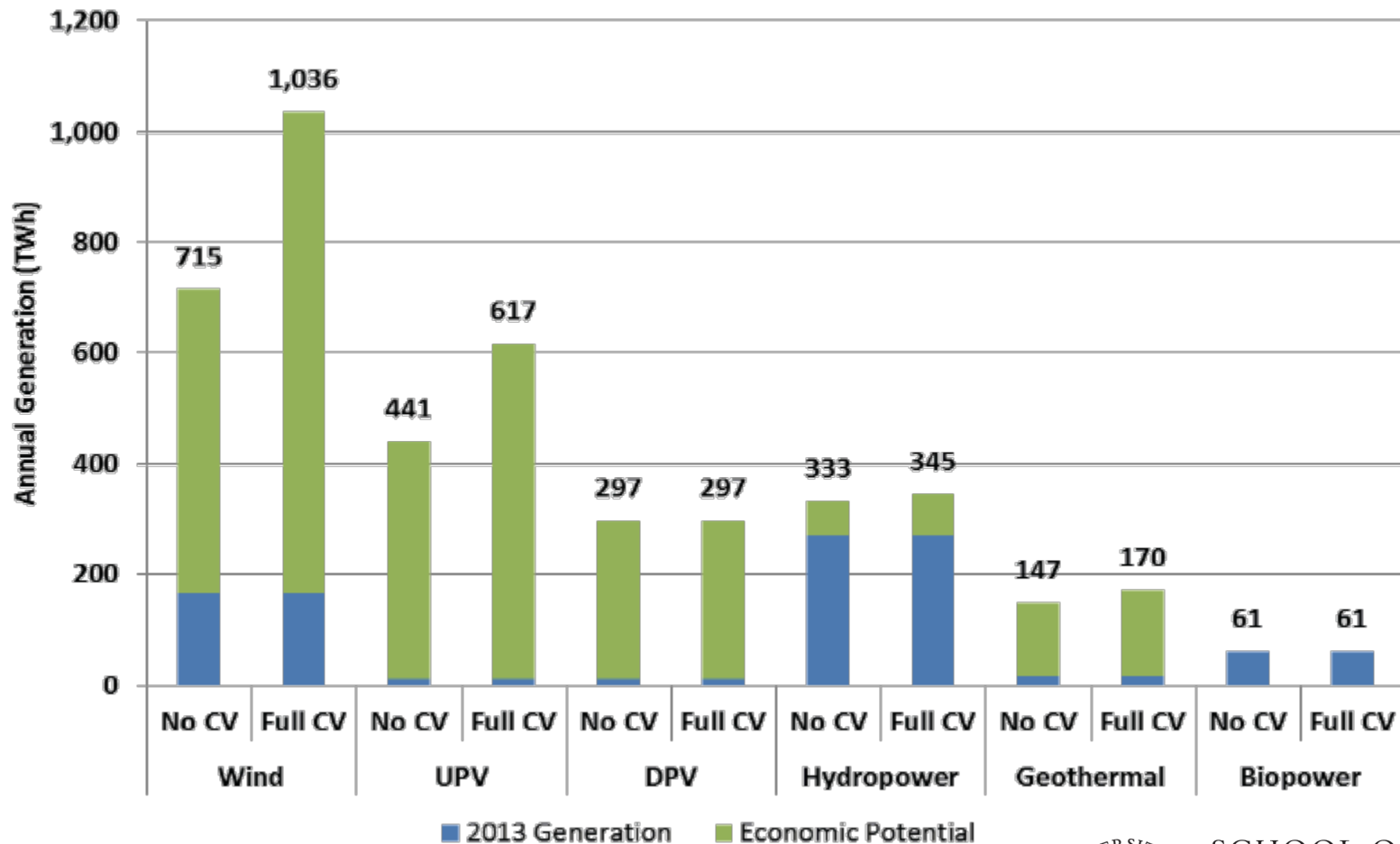
# Questions?



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# U.S. Renewable Energy – Economic Potential



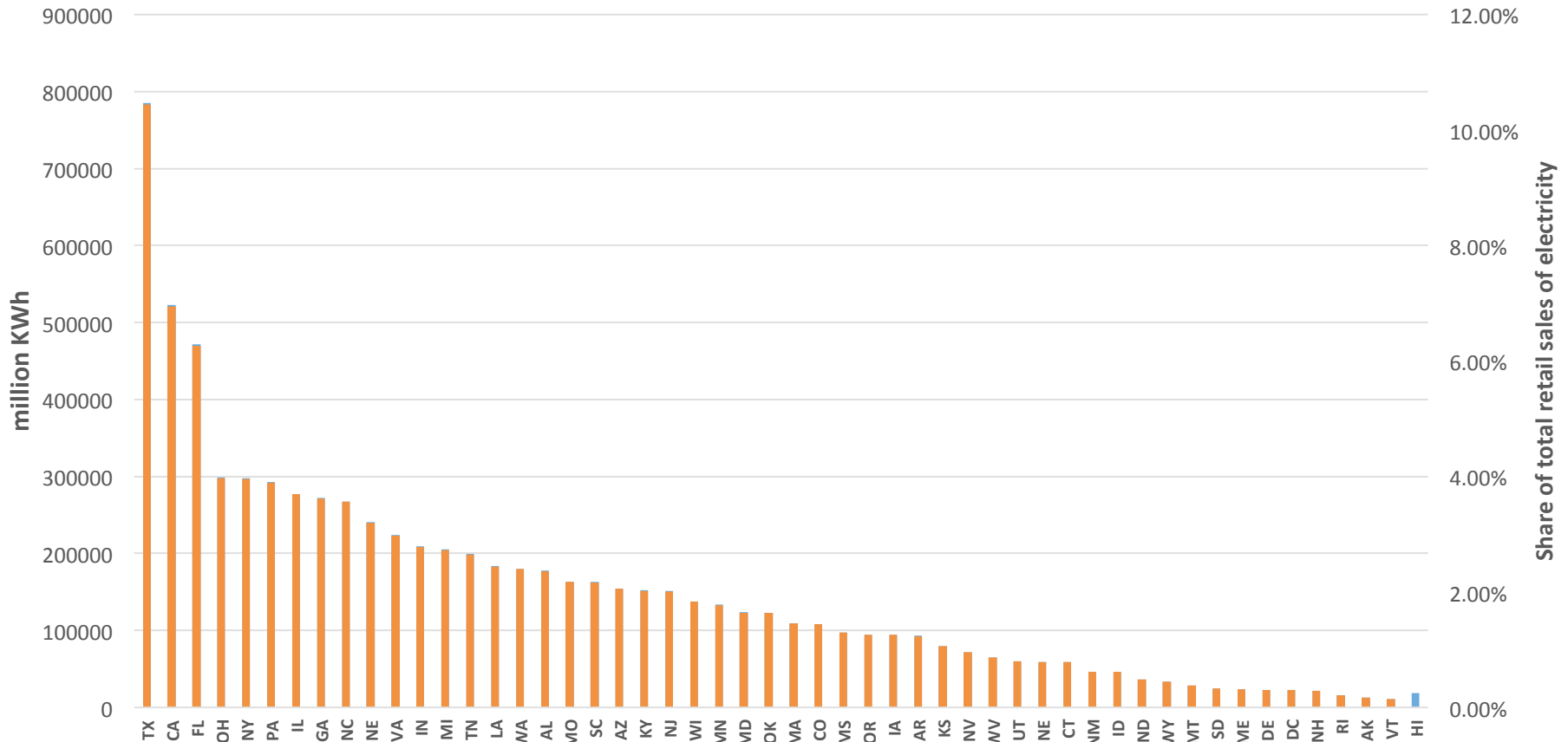
Cappana, Steve et al. (2015). NREL.



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# Retails Sales of Electricity by State

U.S. State-Wise Retail Sales of Electricity, 2015



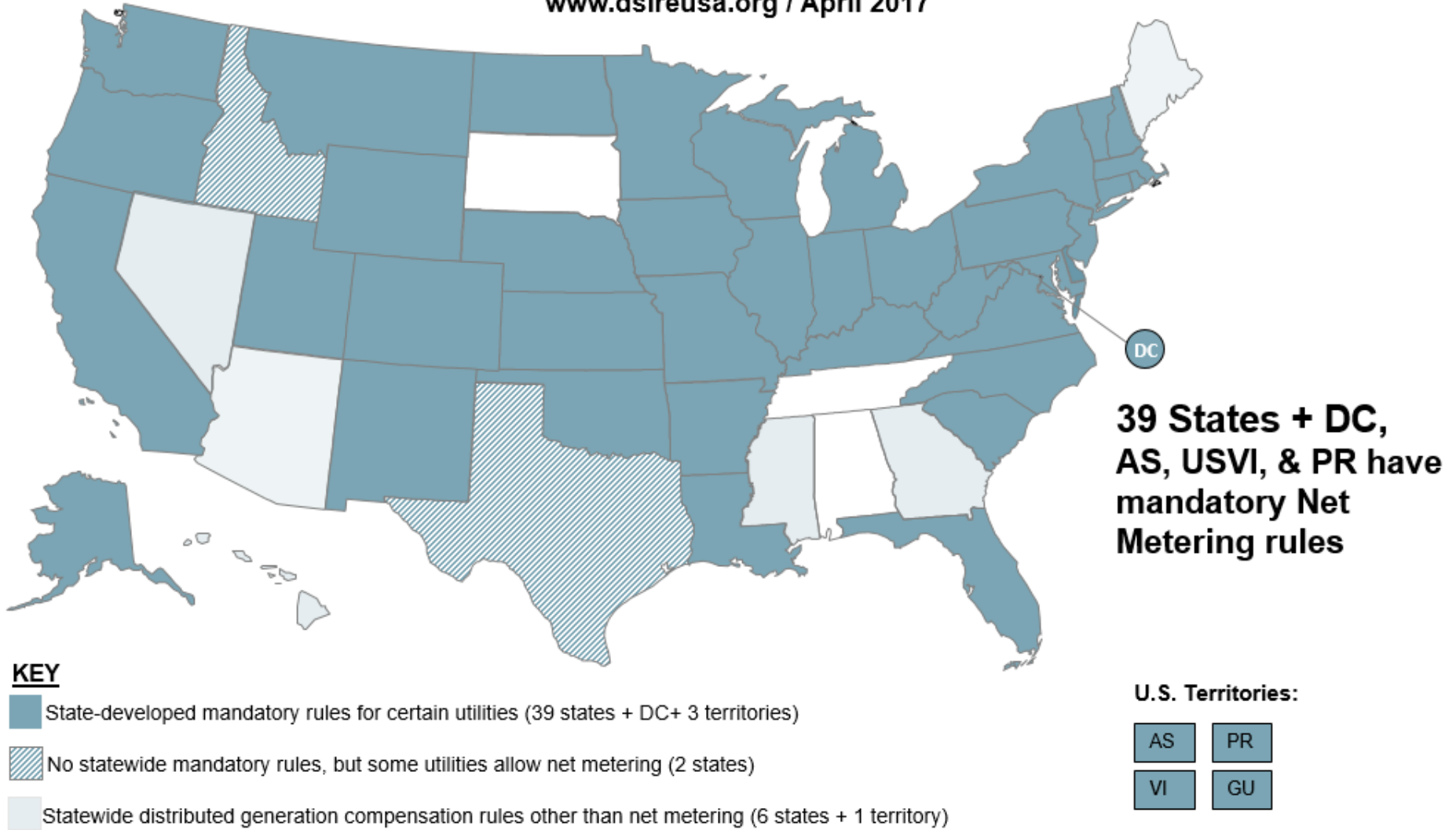
U.S. Energy Information Administration (EIA) (2017d).



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# Net Metering

www.dsireusa.org / April 2017



Database of State Incentives for Renewable Energy (DSIRE) (2017b).



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