



From Paris to Honolulu: US State Climate Policies in the 21st Century

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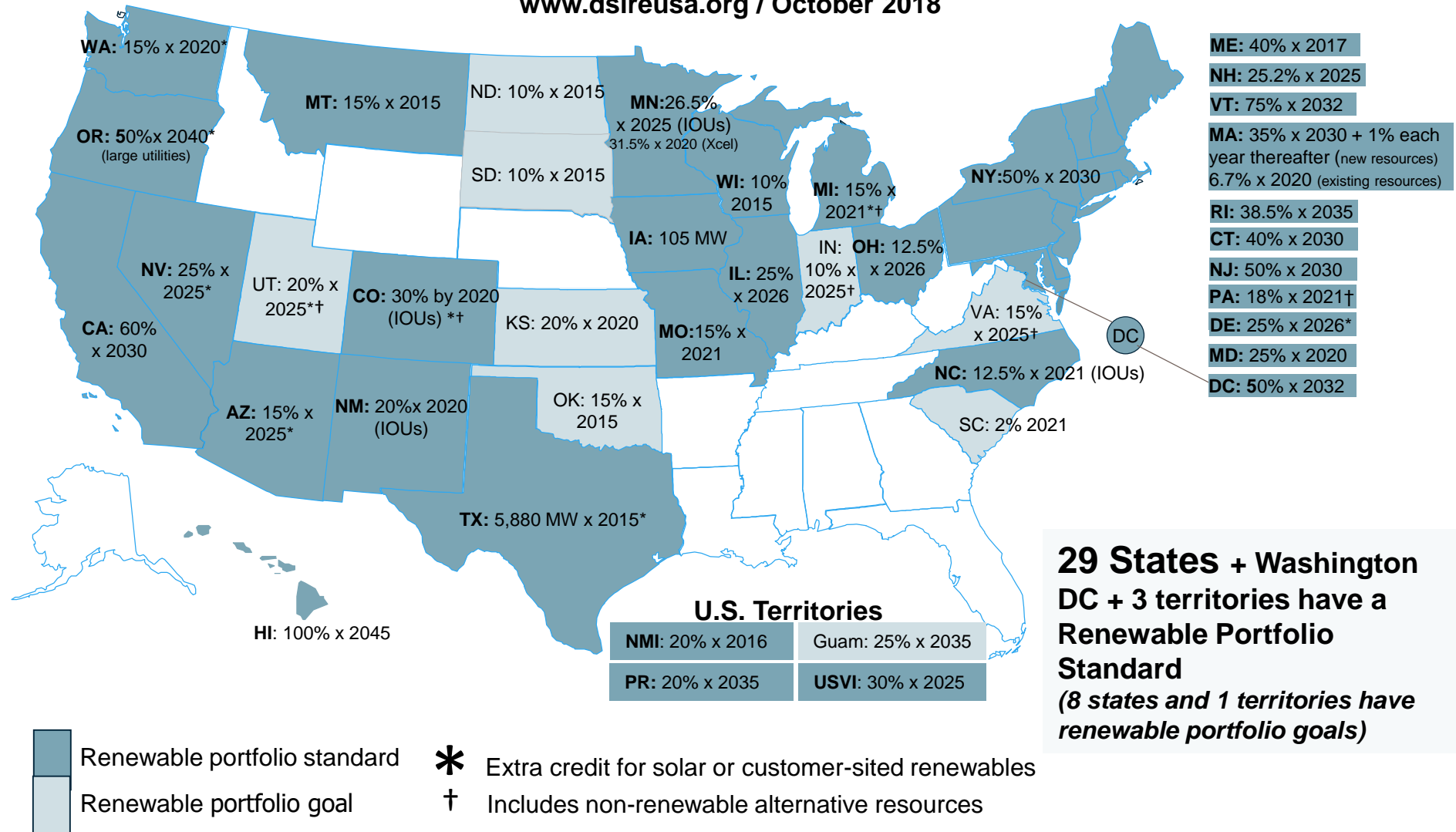
State and Regional Climate Policies are Multifaceted like NDCs

- Electricity Policies
 - Renewable portfolio standards
 - Clean energy standards
 - Energy efficiency resource standards
 - Regional cap and trade programs (RGGI, CA)
- Transportation Policies
 - Regional cap-and-trade (Transportation and Climate Initiative)
 - Low-carbon fuel standard
- Economy-wide
 - US Climate Alliance Commitments
- Similar to the nationally determined contributions (NDCs) where each state pursues its own declared goal using a collection of different policy instruments
- In aggregate, state efforts start to add up
 - States in the US Climate Alliance represented over **40%** of total US GHG emissions in 2016 (See [EIA 2018](#))



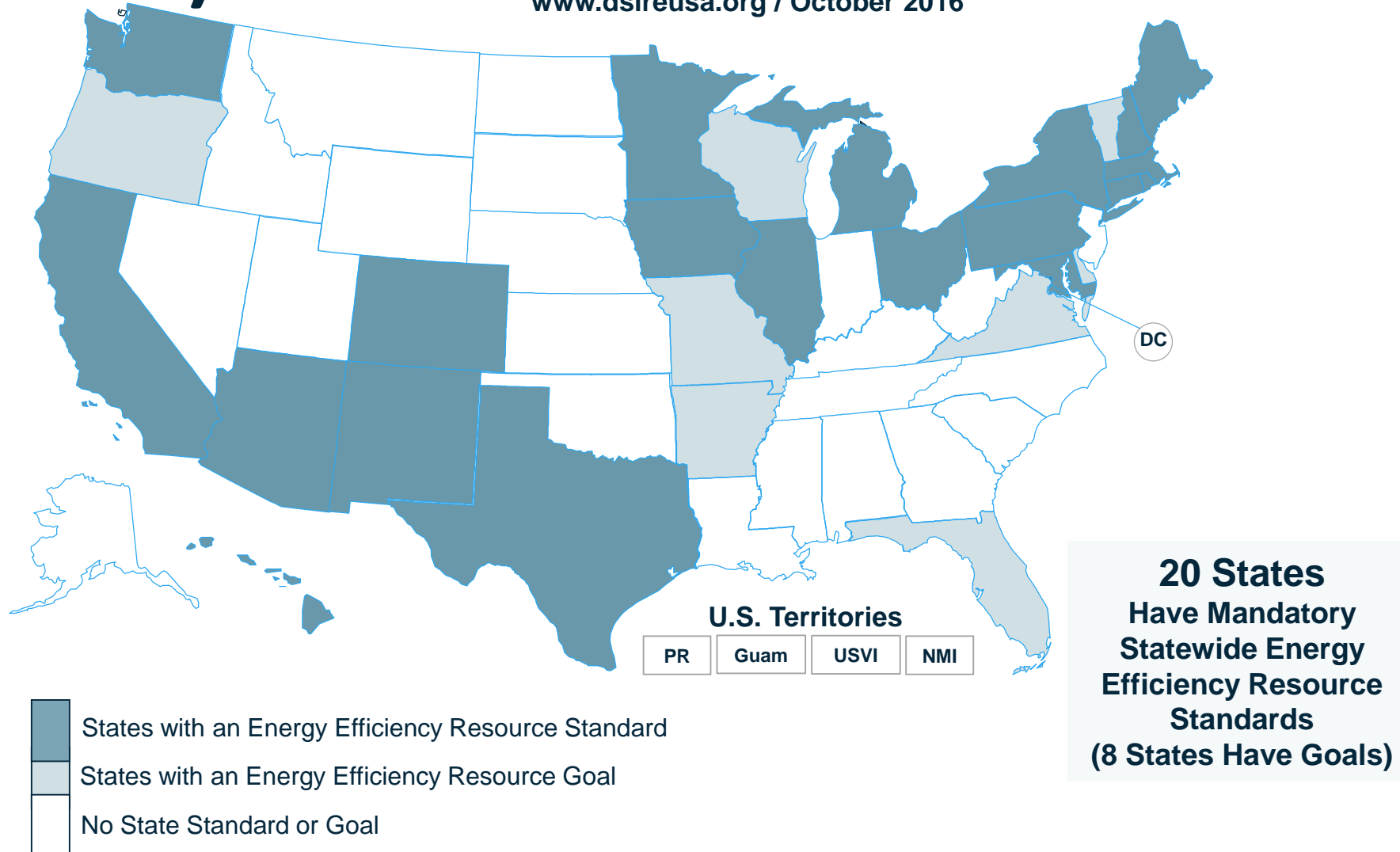
Renewable Portfolio Standard Policies

www.dsireusa.org / October 2018

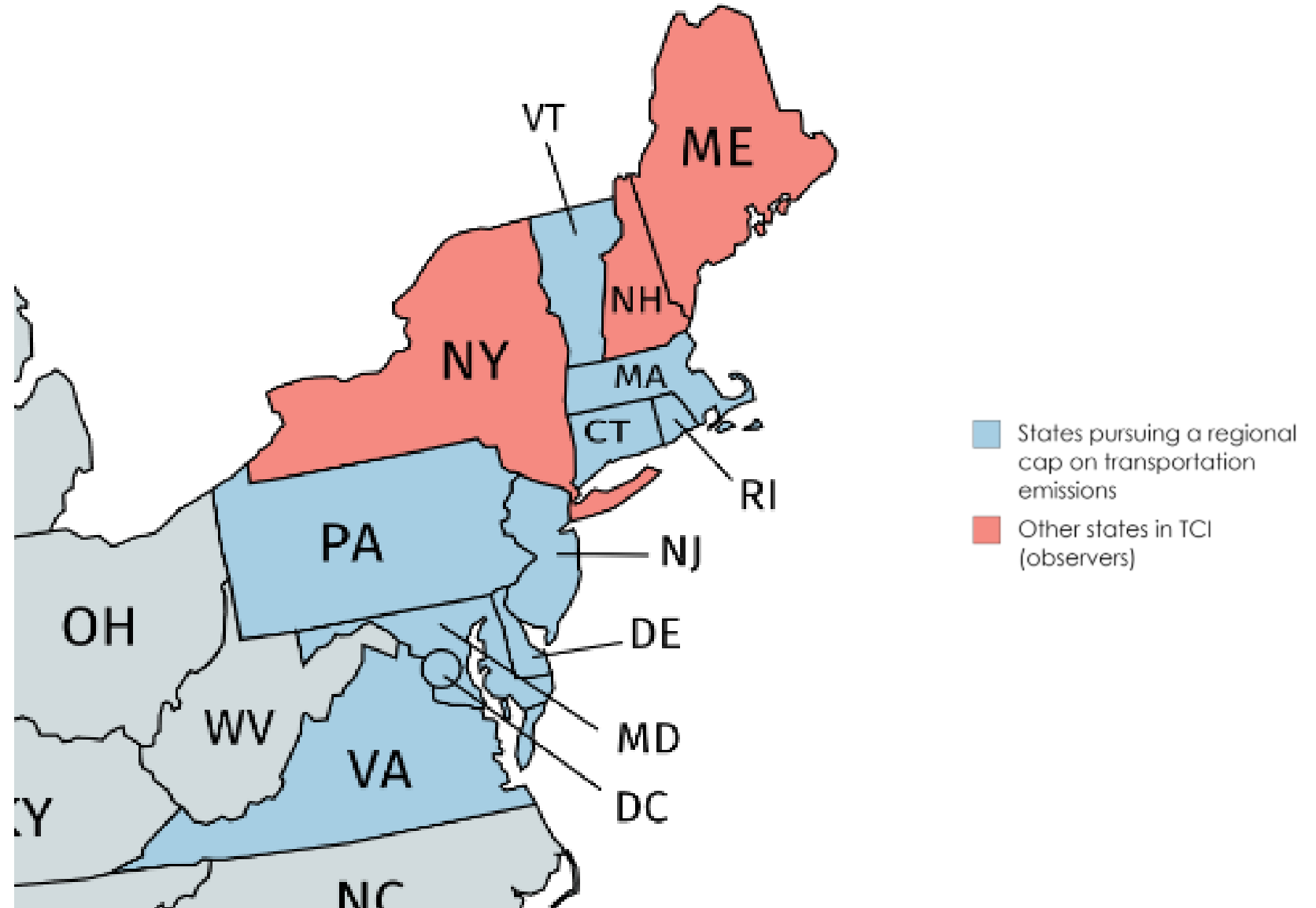


Energy Efficiency Resource Standards (and Goals)

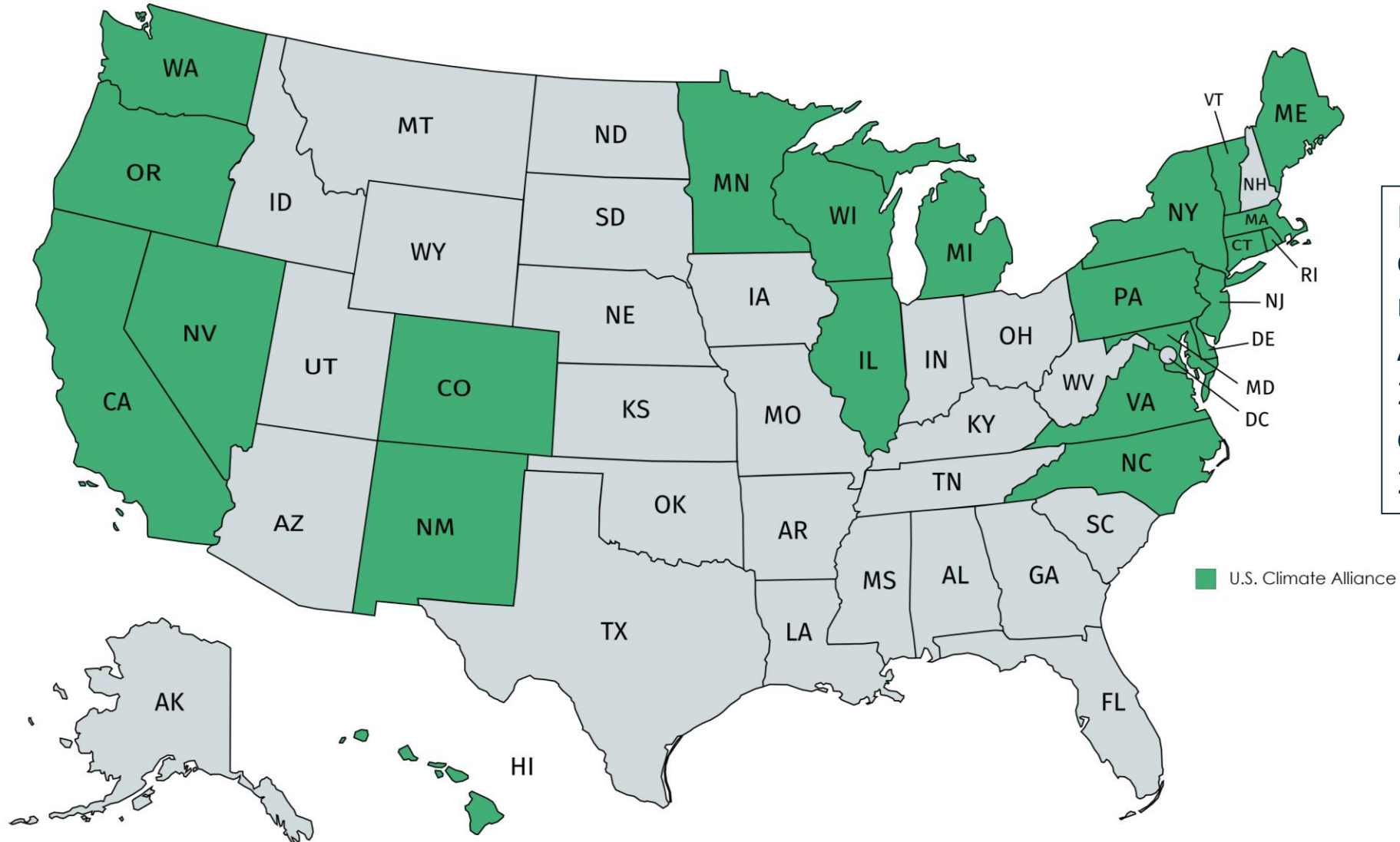
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States in the Transportation and Climate Initiative



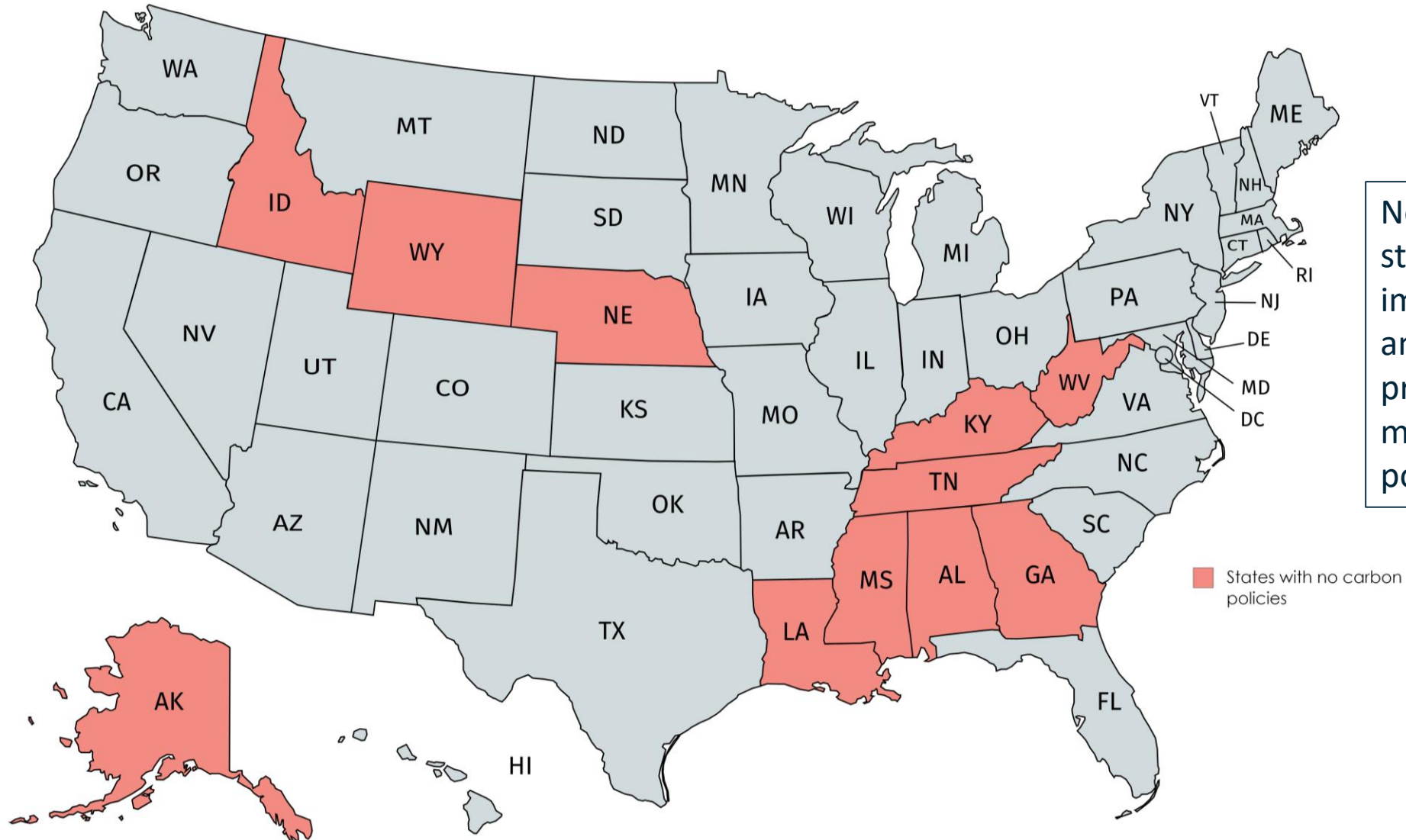
States in the US Climate Alliance



Member states are committed to meeting US Paris Agreement Goal of 26-28% below 2005 emission levels by 2025



States with No Climate Policy



None of these states have implemented any of the previously mentioned policies



Some States are Pursuing Aggressive Goals

- Vermont
 - 75% renewable energy by 2032
- New York
 - 50% renewable energy by 2030; governor proposed 100% carbon free by 2040.
- California
 - 100% zero-carbon electricity by 2045, of which 60% must come from renewable resources by 2030
- Nevada
 - Similar to CA, 100% zero-carbon electricity by 2050, of which 50% must come from renewable resources by 2030
- Hawaii
 - 100% renewable energy by 2045
- Washington
 - Recently passed 100% clean energy by 2045 law



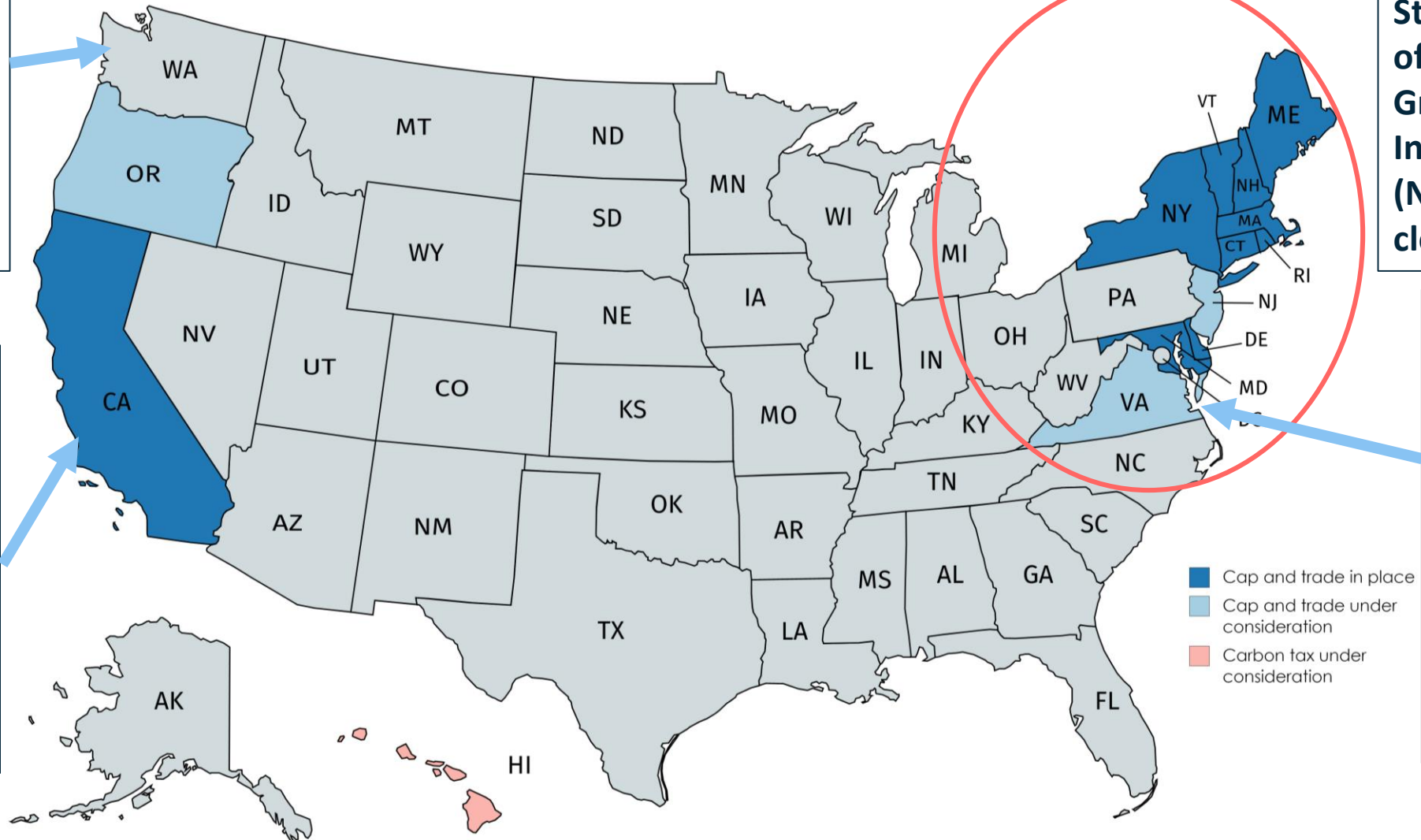
States with Carbon Pricing

Washington State attempted to pass a carbon tax twice but failed

CA is part of the Western Climate Initiative (WCI) trading program with some Canadian Provinces

9 Northeast States are a part of the Regional Greenhouse Gas Initiative (RGGI) (New Jersey is close to joining)

Virginia finalized regulation to link to RGGI, but legislature recently defunded linking activities by DEQ.

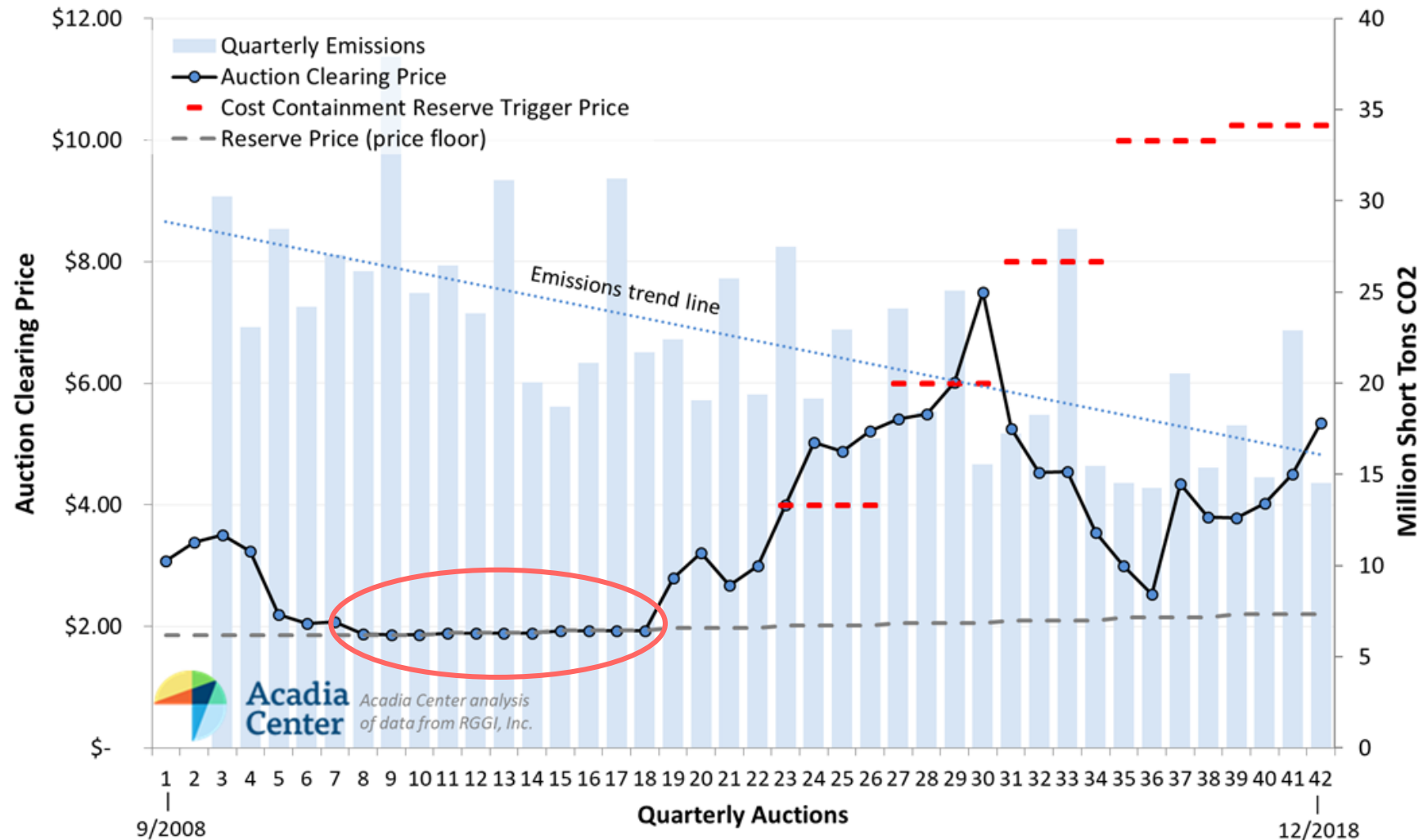


States are Innovators on Carbon Pricing

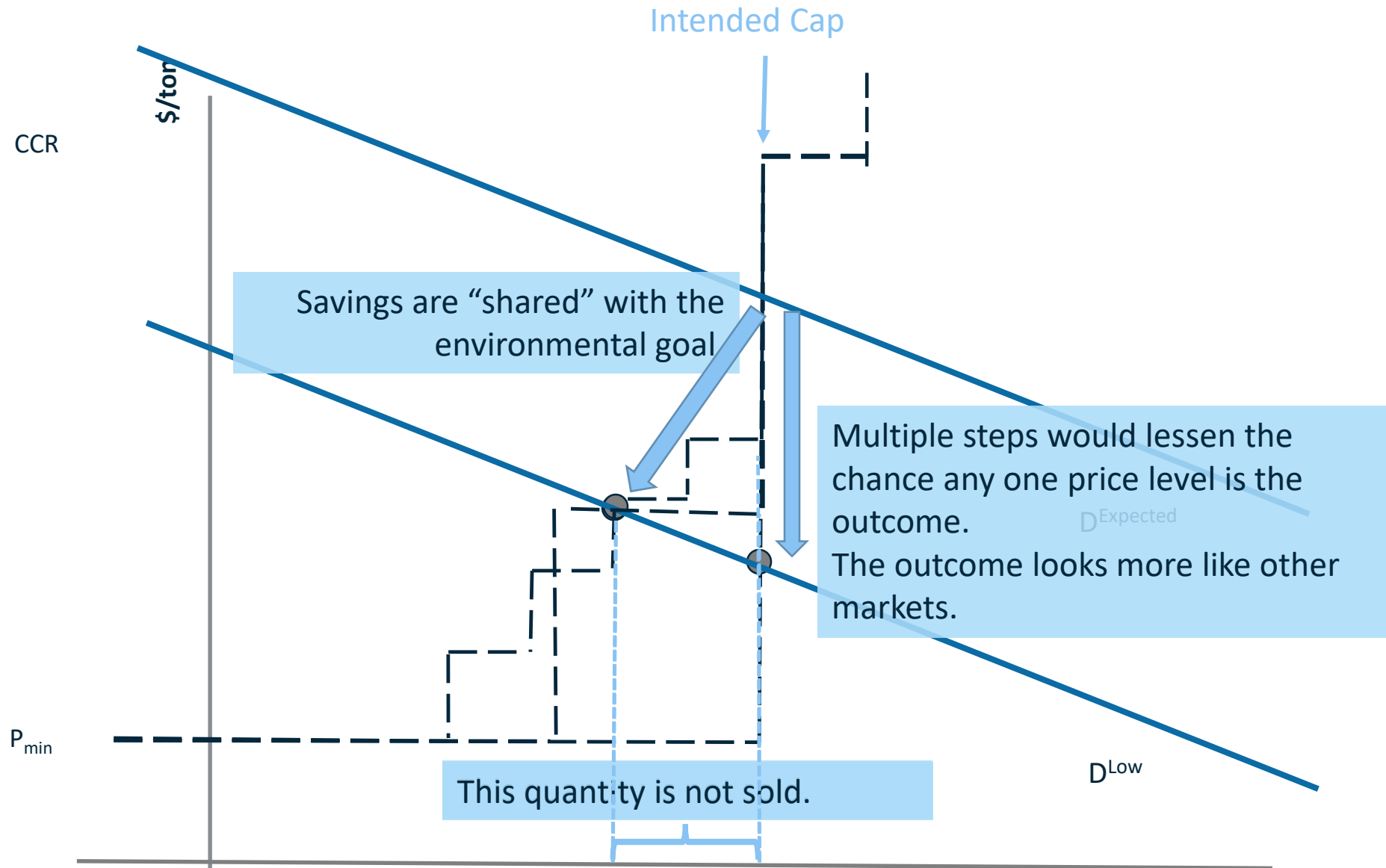
- Regional Greenhouse Gas Initiative (RGGI)
 - ~~Regional cap-and-trade program for electricity~~
 - Features include an allowance auction, price floor, cost containment reserve, emission containment reserve and declining cap over time
 - RGGI footprint expected to expand in 2020 with addition of NJ
- California Cap and Trade Program
 - Economy-wide cap-and-trade program that includes electricity, industry, and more recently, transportation
 - Features include an auction, cost containment reserve, price ceiling and floor, and inclusion of carbon offsets for compliance
- New York ISO Carbon Adder Proposal
 - New York considering incorporating carbon pricing into wholesale markets at the social cost of carbon *minus the RGGI allowance price*
- PJM
 - Recently initiated a stakeholder process to create a method for integrating state carbon pricing mechanisms into the PJM wholesale markets (such as states that participate in RGGI) and prevent leakage between states



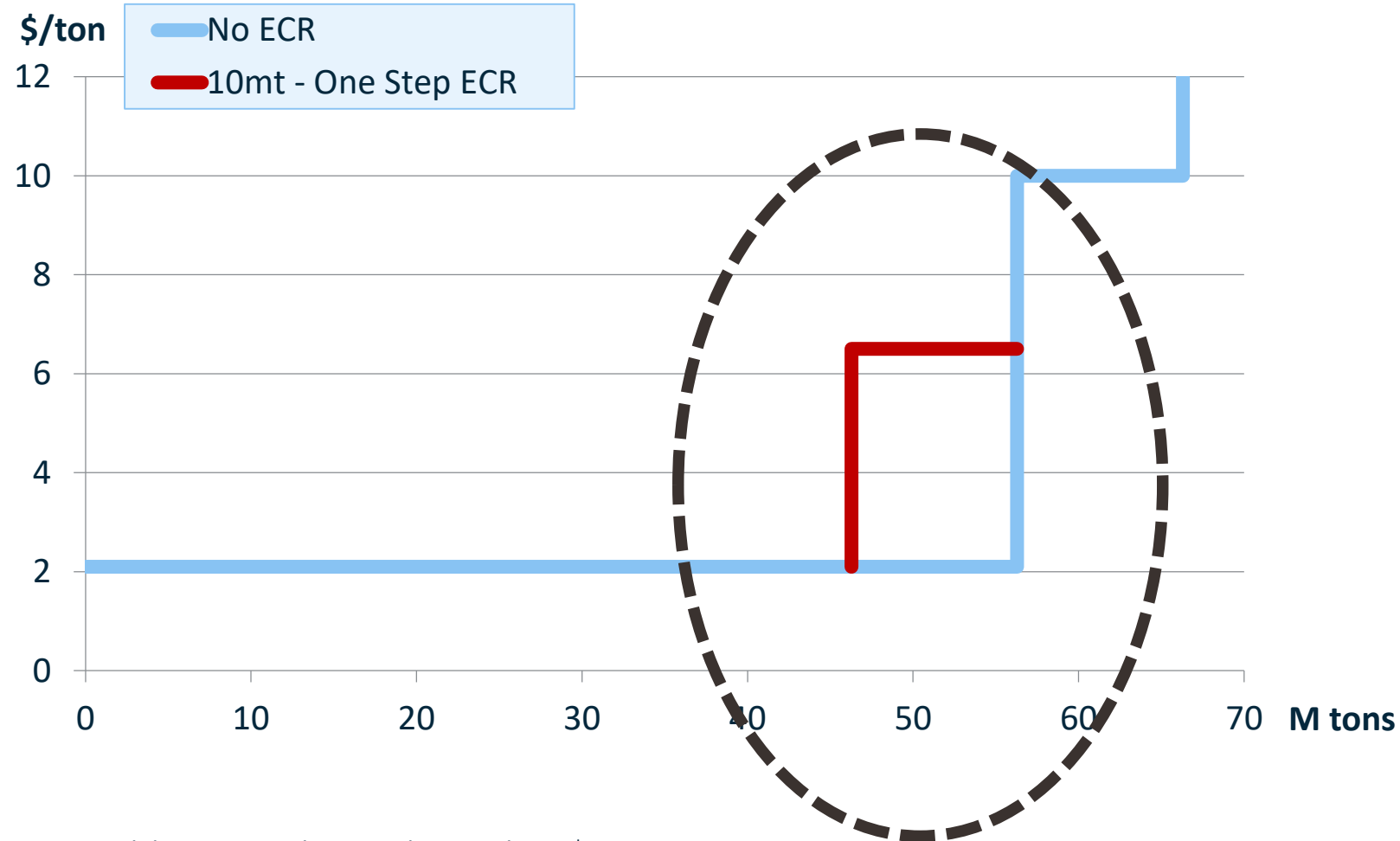
RGGI Experience with Allowance Prices



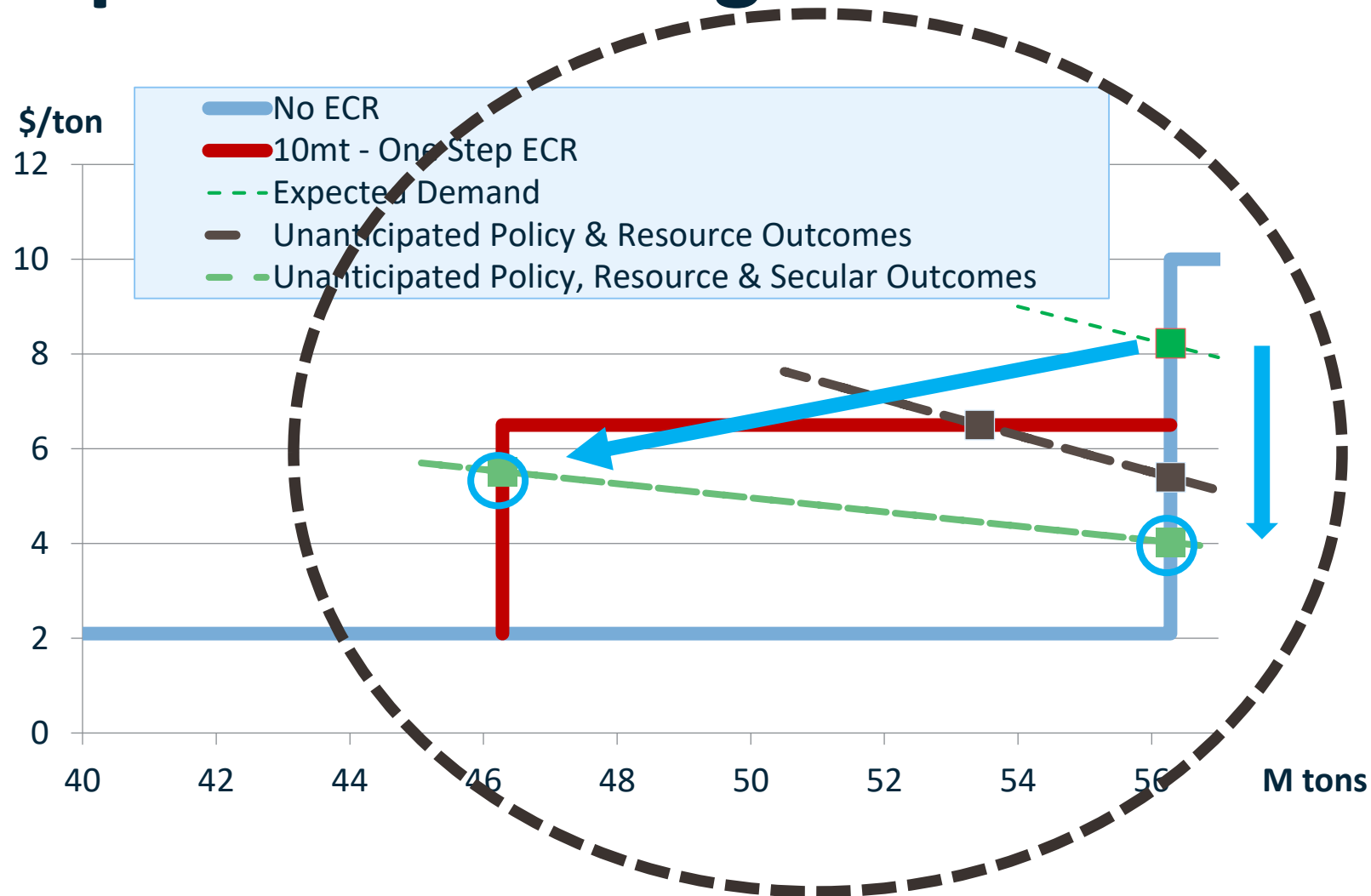
A Price Responsive Allowance Supply Curve



Modelled ECR of 10 million tons at \$6.50 per ton



Close Up of ECR Sharing Outcome

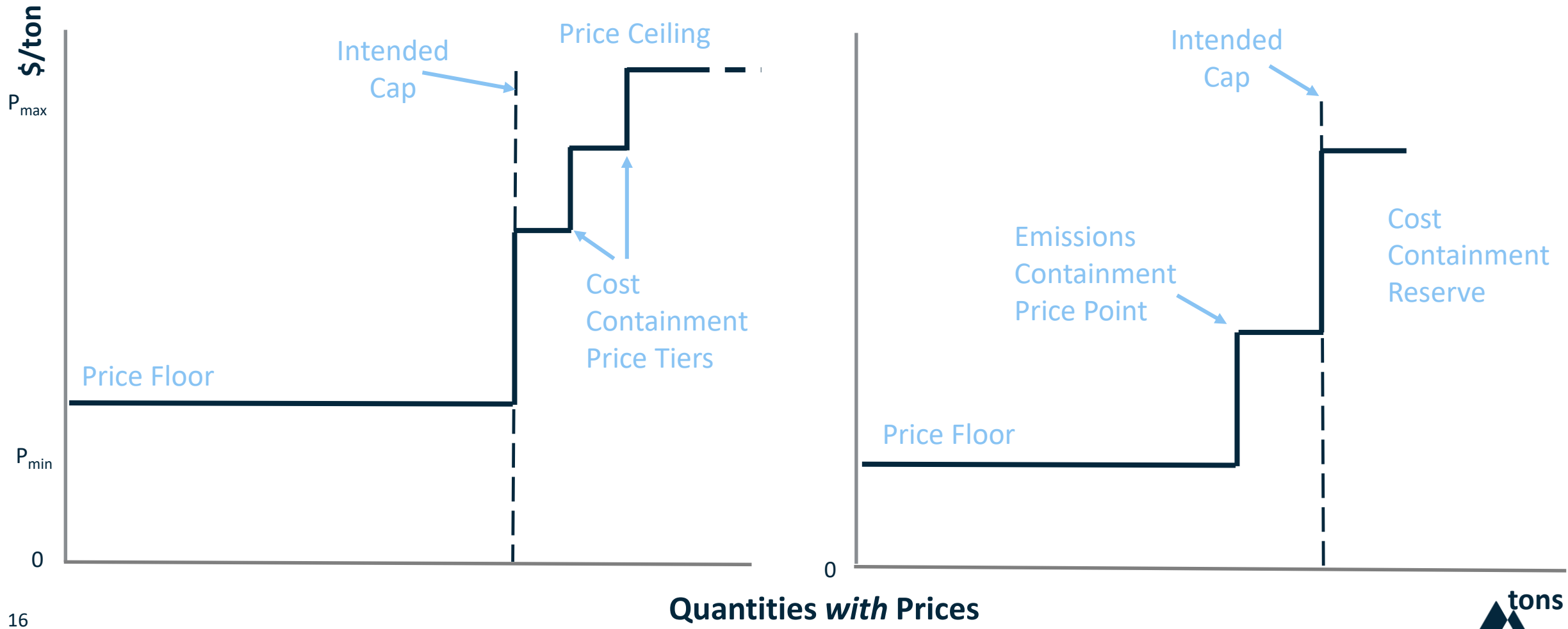


Results from Simulations

3.5% Annual Cap Reduction	Reference Case	Low Allowance Demand: Policy, Resource and Secular Unanticipated Outcomes			
2020 Results (2011 dollars)	No ECR	No ECR	One Step ECR (10Mtons)	Three Step ECR (15 Mtons)	Ramp ECR (17.5Mtons)
Retail Electricity Price (\$/MWh)	143	140	141	141	141
Fossil Generation (TWh)	143.5	112.1	101.7	107.6	106.4
Nonemitting Generation (TWh)	152.6	160.3	166.4	162.6	163.3
Allowance Price (\$/ton CO ₂)	8.2	4.0	5.3	5.0	5.0
RGGI Covered Emissions (Mtons)	72.3	70.1	62.5	66.6	65.8
SO ₂ Emissions (Mtons)	10.4	13.4	11.8	12.8	12.7
Allowance Value (M\$)	463	226	246	253	250



Supply Schedules in N. American Carbon Trading Programs



Including consignment auctions with free allowances

New RFF Report

- Analyze RGGI-like carbon cap and trade and technology policies in six states: North Carolina, Pennsylvania, Illinois, Michigan, Minnesota and Wisconsin.
- Intended reductions in annual emissions from cap of 30% over 10 years; *achieved* cumulative reductions across states *exceed* intended by roughly *40 percent*.
- Reductions achieved at low cost and state programs could easily link to RGGI for reduced uncertainty in program cost.



Conclusions

- States have been leaders with respect to carbon policies
 - Includes a range of technology and pricing policies
 - Some have or are developing policies that affect multiple sectors
 - Over twenty have committed to meeting Paris goals
- Some states have aggressive policies, and the list is getting longer
- Carbon pricing can achieve important emissions reductions at low cost.
- Price responsive allowance supply is an important innovation that makes carbon pricing policy politically resilient and gives potency to other policies.



Thank you.

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