Committees on Energy Resources & the Environment and Electricity

100 % Clean Energy: What Comes Next for Regulators
100% Clean Energy
What comes next for regulators?

Leia Guccione, Rocky Mountain Institute
NARUC Summer Policy Summit, July 2019
We are entering an era of 100% clean energy for U.S. states, cities and utilities.

11 States + DC + PR
~26% of U.S. electricity sales

12 Utilities
~10 million customers

>110 Cities
~6% of the U.S. population

100%
Renewable
Clean
Carbon-Neutral
Carbon-Free

Sources: S&P Global (2017), U.S. Census Bureau (2018 estimates), utility websites
States with 100% clean energy goals or commitment represent 26% of all U.S. retail electricity sales and ~10% of current U.S. fossil generation.

Bubble sizes = Percent U.S. retail electricity sales (CA=6.8%)

Source: S&P Global, EIA (2017)
Cities with 100% targets extend far beyond the borders of state targets

Source: Sierra Club “Ready for 100”
The timelines for reaching 100% commitments vary between cities, states, and utilities.

- **Cities**
  - 2030: 31
  - 2035: 40

- **States**
  - 2030: 0
  - 2035: 1
  - 2040: 1
  - 2045: 4
  - 2050: 7

- **Utilities**
  - 2030: 1
  - 2035: 1
  - 2040: 3
  - 2045: 3
  - 2050: 3

Sources: SEPA, Sierra Club's “Ready for 100,” and state announcements.
Carbon neutral, zero carbon, and renewables-only goals allow different technologies to be used for compliance, and entail different pathways for implementation.

<table>
<thead>
<tr>
<th>Key Feature</th>
<th>Carbon Neutral</th>
<th>Zero Carbon</th>
<th>Renewables</th>
</tr>
</thead>
<tbody>
<tr>
<td>States</td>
<td>New Jersey</td>
<td>California, Nevada, New Mexico, New York, Washington, Wisconsin</td>
<td>Colorado, Washington DC, Hawaii, Maine</td>
</tr>
<tr>
<td></td>
<td>Can allow CCS</td>
<td>No fossil fuels</td>
<td>Can exclude nuclear</td>
</tr>
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These categories are not necessarily mutually exclusive.
Carbon neutral, zero carbon and renewables-only goals allow different technologies to be used for compliance…

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California requires 60% renewables by 2030 and zero-carbon power (and carbon neutrality state-wide) by 2045.

Avista has a 2027 carbon neutral goal and a 2045 carbon free goal.

Washington has a statewide carbon neutral by 2030 goal & a zero-carbon by 2045 power sector goal.

These categories are not necessarily mutually exclusive!
Other design details matter for implementation too.

- State-wide
- Legislative
- Demand-based
- Prescriptive
- Community-wide
  
- Sector-specific
- Executive
- Production-based
- Flexible
- Operations-only
Other design details matter for implementation too.

<table>
<thead>
<tr>
<th>State</th>
<th>100% Goal (Year)</th>
<th>Definition</th>
<th>Sectors</th>
<th>Interim Milestones</th>
<th>State-wide GHG Reduction Goal</th>
</tr>
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<tr>
<td><strong>Executive Action</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Colorado</td>
<td>Renewables (2050)</td>
<td>Governor Polis’ “Roadmap to 100%” mentions renewables only, and includes policies for the building and transportation sectors.</td>
<td>Electricity, Transportation, Buildings</td>
<td>30%/2020</td>
<td>90%/2005/2050</td>
</tr>
<tr>
<td>New Jersey</td>
<td>Carbon Neutral (2050)</td>
<td>The draft EMP defines “100% clean energy” as “100% carbon-neutral” generation and “maximum electrification of the transportation and building sectors” to meet the state’s GHG goals.</td>
<td>Electricity, Buildings, Transportation</td>
<td>50%/2030</td>
<td>80%/2006/2050</td>
</tr>
<tr>
<td>New York</td>
<td>Zero Carbon (2040)</td>
<td>Governor Cuomo’s Green New Deal directs New York’s power to be “100% carbon-free.”</td>
<td>Electricity</td>
<td>70%/2030</td>
<td>40%/1980/2030, 80%/1990/2050</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>Zero Carbon (2050)</td>
<td>Governor Evers’ Budget directs that all electricity produced in the state should be 100% carbon-free.</td>
<td>Electricity</td>
<td>10%/2015</td>
<td>26%/2005/2025</td>
</tr>
<tr>
<td><strong>Legislative Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>California</td>
<td>Zero Carbon (2045)</td>
<td>100% of retail electricity sales to California end-users must be supplied from “renewable &amp; zero-carbon resources.”</td>
<td>Electricity</td>
<td>50%/2025, 60%/2030 (R only)</td>
<td>80%/1990/2050, Carbon-neutral by 2045</td>
</tr>
<tr>
<td>Washington DC</td>
<td>Renewables (2032)</td>
<td>No less than 95% from tier one resources, and at least 5% from solar.</td>
<td>Electricity</td>
<td>54%/2025, 83%/2030</td>
<td></td>
</tr>
<tr>
<td>Hawaii</td>
<td>Renewables (2045)</td>
<td>100% of electricity sales must be produced by renewable energy resources.</td>
<td>Electricity</td>
<td>30%/2020, 40%/2030, 70%/2040</td>
<td>Net zero emissions by 2045</td>
</tr>
<tr>
<td>Maine</td>
<td>Renewables (2050)</td>
<td>100% of retail sales electricity in the state must come from renewable resources.</td>
<td>Electricity</td>
<td>80%/2030</td>
<td>45%/1990/2030, 80%/1990/2050</td>
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<td>New Mexico</td>
<td>Zero Carbon (2050)</td>
<td>Zero carbon resources (emit no carbon or reduces methane) must supply 100% of all retail sales of electricity in New Mexico.</td>
<td>Electricity (IOUs &amp; rural coops)</td>
<td>20%/2020, 50%/2030, 80%/2040</td>
<td>45%/2005/2030</td>
</tr>
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<td>Nevada</td>
<td>Zero Carbon (2050)</td>
<td>Energy production from “zero carbon resources equal to the total amount of electricity sold by providers of electric service” in the state.</td>
<td>Electricity</td>
<td>50%/2030</td>
<td>26%/2005/2025</td>
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<td>Washington</td>
<td>Zero Carbon (2045)</td>
<td>80% of power sales must be from “non-emitting electric generation and electricity from renewable resources.” Up to 20% can be via RECs, ACPs or ETPs.</td>
<td>Electricity</td>
<td>100% coal free by 2025</td>
<td>57%/2005/2050, Carbon-neutral by 2030</td>
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The time to prepare is now, as more 100% goals may be on the way...

New Illinois Bill Targets 100% Renewable—Not Just Clean—Electricity by 2050

Getting to 100 percent renewables is “not just a pie-in-the-sky idea,” according to...
QUESTIONS & DISCUSSION
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