

# A CLEAN ELECTRICITY STANDARD'S WEAKNESSES MAY BE ITS BIGGEST STRENGTHS

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MAY 2019

Today, Senator Tina Smith (D-MN) and Congressman Ben Ray Lujan (D-NM) proposed the Clean Energy Standard Act of 2019. The legislation would require utilities to gradually increase the portion of electricity sales from clean sources every year, targeting an over 95 percent clean US electricity system by midcentury or soon after. This brief describes the major benefits and limitations of adopting a clean electricity standard to pursue the goal of lowering US greenhouse gas emissions.

Economists like clean electricity standards (CESs) because they are technology neutral and market-based policies. By encouraging all low-carbon electricity sources and enabling trading of “clean energy credits,” Senator Smith’s proposal encourages the cheapest clean sources of generation to satisfy future demands for electricity without anyone needing to know in advance what those technologies will be.

However, a CES is not economists’ first choice, because a price on carbon could encourage low-cost emissions reductions across virtually the entire economy. The same emissions reductions can be achieved at a lower cost with a carbon price than with a CES. Senator Smith’s CES is also not the first choice of most climate policy advocates because it does not chart a pace of decarbonization consistent with a national net-zero emissions target over the next few decades.

Of course, the least effective policies are ones that are never implemented. The same characteristics of CES that economists and climate advocates see as limitations could be advantages that help overcome the political constraints that have prevented the passage of serious climate policy in the United States to date. This brief discusses some of the advantages a CES could offer, specifically:

- a gradual decline of the US coal industry,
- delaying confrontations with powerful industries, and
- avoiding concerns about price pain for energy consumers.

## A CES Offers a More Gradual Decline of the US Coal Industry Compared to a Carbon Price

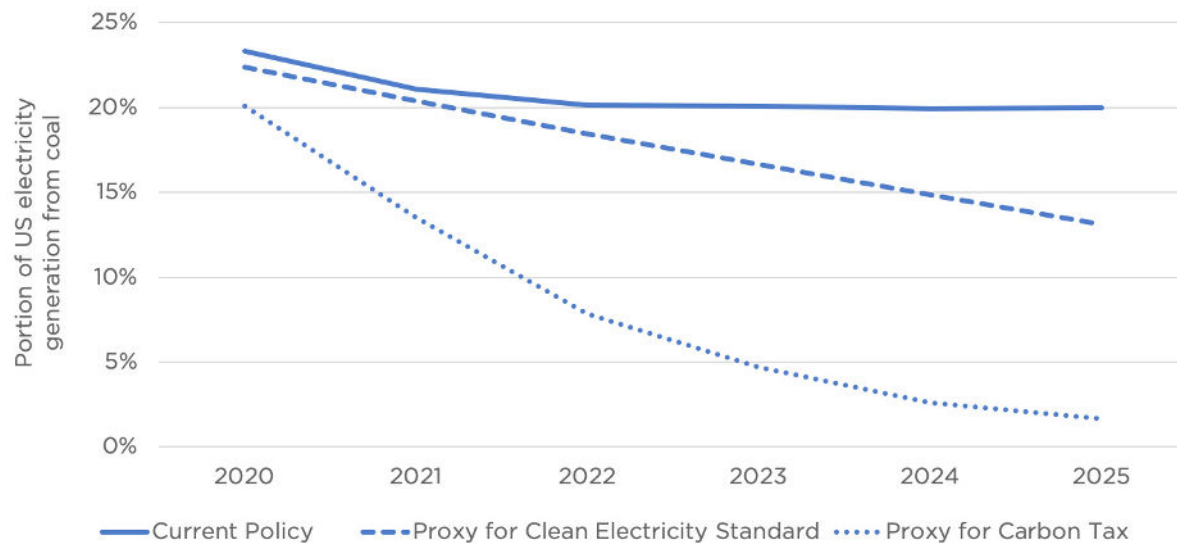
Over 80 percent<sup>1</sup> of coal produced in the United States is used in the power sector, and over a quarter<sup>2</sup> of US electricity generation was produced using coal in 2018. Coal is the most carbon-intensive fossil fuel, and it produces the most harmful local pollutants as well. Fortunately, shifting away from coal use in the US power sector is relatively cheap due to the availability of lower-carbon natural gas and renewables—that's why a carbon price could rapidly push coal out of the US electricity system.<sup>3</sup>

The problem is that the US coal industry is highly geographically concentrated, meaning a relatively small number of local economies across the country are highly reliant on the coal industry. The most extreme example is Campbell County, Wyoming, which accounts for over one-third<sup>4</sup> of total US coal production. Here, as in many small counties in Appalachia, the coal industry is the largest contributor to employment<sup>5</sup> and funder of government services. The US Energy Information Administration analyzed a scenario<sup>6</sup> with a carbon price on power-sector emissions starting at \$25/ton in 2020 and growing by 5 percent per year and found that it would virtually eliminate coal production in Campbell County by the mid-2020s. Without strong measures to counteract these impacts, coal communities across the country would be left high and dry.

Carbon tax proposals often allocate revenue to compensate coal workers and communities and invest in the economies of these regions—indeed, a small sliver of carbon tax revenue could provide billions of dollars per year<sup>7</sup> in assistance to these regions. These packages may be a good deal for coal communities: the economies of these regions are slowly drowning<sup>8</sup> due to the gradual replacement of coal-fired power with natural gas and renewables,<sup>9</sup> and outside funding that enables economic diversification may be the only lifeboat available. Realistically, however, rebuilding these economies will take place on a time scale that is far slower than the impacts of carbon price.

Senator Smith's CES takes a different approach, requiring large utilities to increase the portion of clean electricity sales by 2.75 percentage points per year. For regions that start with little clean electricity, this implies a gradual transition: if a utility starts with a clean electricity percentage of 10 percent in 2020, the requirement is 37.5 percent in 2030, and over 60 percent by 2040. Coal producing regions would still be hit hard by the decreasing nationwide demand for their product. However, in Wyoming and West Virginia, where over 80 percent of electricity consumed in the states is produced using coal, utilities could shift away from coal over decades.



**Figure 1:** Portion of US electricity generation from coal-fired generators

Notes: Current policy scenario is from Rhodium Group's *Taking Stock 2018* report; see <https://rhg.com/research/taking-stock-2018/>.<sup>10</sup>

The Proxy for Carbon Tax is from modeling by the Rhodium Group, in collaboration with the Columbia SIPA Center on Global Energy Policy, that assumes a \$15/metric ton tax is implemented starting in 2020 and increases at \$10 per year, comparable to the Energy Innovation and Carbon Dividend Act<sup>11</sup> that has been proposed in the US House of Representatives in 2019.

The Proxy for Clean Electricity Standard uses data from 2016 on electricity generation from the *Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the United States* report. The data is scaled to match the current portion of coal in the total US electricity generation mix. It assumes that each year, each power producer reduces the portion of coal in its generation mix by 2.75 percentage points starting in 2020. See <https://www.ceres.org/AirBenchmarking2018>.<sup>12</sup>

In the near-term, Senator Smith's CES may not encourage emissions reductions much beyond those already expected in many parts of the country. Rhodium Group projects<sup>13</sup> nationwide power sector emissions are expected to fall by about 5 percent per year between 2016 and 2025 under current policies alone. But market forces and current policies do not guarantee a shift to a near carbon-free electricity system.

Senator Smith's CES would lock in the long-term decline of coal and the eventual decline of natural gas in the power sector (with the exception of power plants that deploy carbon capture and storage technologies), which is a dramatic change from the country's current long-term trajectory. The CES could also significantly reduce the near-term economic shocks that a carbon price would cause in coal producing regions.

## A CES Delays Confrontations with Powerful Industries

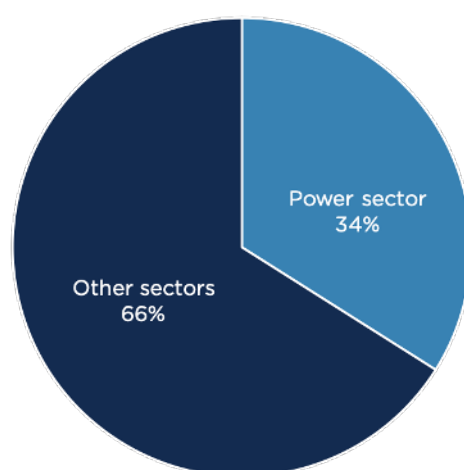
Recent federal carbon tax proposals<sup>14</sup> cover nearly all CO<sub>2</sub> emissions from the US energy system and often certain emissions from nonenergy sources as well. Broad coverage is ideal

because low-cost mitigation opportunities exist across all sectors of the economy. Even in sectors that are likely to be relatively unresponsive to a carbon tax in the near term, a price on carbon will shift incentives for private sector investments and spur innovation in low-carbon technologies (other policies are desirable in these sectors too).<sup>15</sup>

In contrast, Senator Smith's CES covers only the power sector. This narrower coverage – addressing only about one-third of total energy sector CO<sub>2</sub> emissions in the United States – nonetheless might make sense for numerous reasons if a broader policy is out of reach.

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**Figure 2:** Carbon dioxide emissions from the US energy system in 2017



*Source: US Energy Information Administration*

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First, the power sector is disproportionately where the lowest-cost emissions reduction opportunities exist today,<sup>16</sup> thanks mainly to cheap solar, wind, and natural gas. That's why economic models show that over two-thirds of the emissions reductions caused by a carbon price in the 2020s would occur in the power sector.

Second, a carbon-free power sector is uniquely important to a low-carbon energy system. Achieving a low-carbon US energy system by midcentury<sup>17</sup> will require significant electrification of energy sources that currently rely on the direct use of fossil fuels, like vehicles and space heating. By midcentury, the US electricity system may need to double or triple in size.

Third, clean electricity is popular.<sup>18</sup> A CES that promotes a shift to clean electricity may, therefore, be popular as well, which could prime the pump for additional climate legislation in the future. (A less optimistic possibility is that passing a CES uses up political capital that could have been used to pass a more comprehensive and ambitious climate policy.)

Fourth, much of the pushback to climate policy comes from established industries outside the power sector. Powerful trade groups are likely to fight any serious climate policy proposals,

with the oil industry as the most notorious opponent. While some major oil companies publicly support a federal carbon tax,<sup>19</sup> the industry has historically fought against climate policies that have a real chance of passing, like Washington State's carbon fee ballot initiative last November.<sup>20</sup>

Reducing emissions throughout the entire energy system will be necessary to achieve any meaningful long-term emissions goals, which means overcoming the opposition to climate policy of powerful industry groups outside the power sector. Still, if strong power-sector climate policy can be achieved by kicking this can down the road, perhaps that is a price worth paying.

## A CES May Avoid Perceptions of Price Pain for Consumers

While a CES targets the fuels used to create electricity, a carbon tax encourages emissions reductions from wherever and however they can be achieved at the lowest cost, which includes consumer responses to the higher prices caused by the carbon tax. The responses of consumers to changes in energy prices are likely to be small but not insignificant,<sup>21</sup> and conservation or efficiency opportunities are often cheap, so the focus on supply *and* demand responses is another reason economists favor a carbon price to a CES.

However, the energy price increases caused by carbon prices, particularly for low-income households, are perhaps the most significant impediment to the popularity of these policies. From a technocratic perspective, this is a solvable problem: by returning at least a portion of the carbon tax revenue back to energy consumers, the vast majority of low- and middle-class households<sup>22</sup> can be overcompensated for the increases in energy prices. All recent federal carbon tax proposals<sup>23</sup> include protection for low-income households.

Nevertheless, the price increases caused by a carbon tax are very visible. To generate opposition to these policies, opponents of carbon prices relentlessly point to these price increases while ignoring the benefits consumers receive from the carbon tax revenue, and politicians often parrot these attacks. Despite having just penned an op-ed<sup>24</sup> calling for serious climate solutions, when Senator Murkowski (R-AK) was asked for her views on a carbon tax-and-rebate policy, she responded:<sup>25</sup> "I am not interested in entertaining a tax that would set a price on carbon that unduly and disproportionately impacts the most vulnerable." In fact, a carbon tax-and-rebate policy would be highly progressive,<sup>26</sup> disproportionately benefiting low-income households. The misperception that a carbon tax is a regressive policy persists, however.

A CES is also likely to increase prices. After all, a CES that is successfully reducing emissions is forcing utilities to shift to clean electricity in situations when it would have been cheaper to stick with dirtier sources. Utilities will pass along these additional costs to customers in the form of higher retail electricity prices.

However, the price increases from a CES are likely to be significantly smaller than from a carbon price for three reasons. First, while a carbon price forces producers to pay for *all* dirty energy production, under a CES, producers incur costs only when they are forced to shift away from dirty energy production, which means fewer expenses to pass along to consumers. Second, Senator Smith's CES is a less stringent policy than recent federal carbon



tax proposals—that means fewer emissions reductions, but also smaller price changes. Third, under a CES, the government issues “clean energy credits,” which are valuable new assets for electricity producers that may encourage additional supply of electricity, thus lowering wholesale electricity prices.

The electricity price changes from a CES are also likely to be hidden from consumers—lost in the noise of regular price fluctuations. While low- and middle-income households could be better off with a progressively-designed carbon tax than with a CES, if policy makers and their constituents believe the opposite is true, this becomes a major advantage of a CES.

## Beggars Can't Be Choosers

Despite overwhelming evidence of the risks of climate change, the United States has failed to pass federal climate legislation for decades, including attempts to pass economy-wide carbon prices and power-sector clean energy standards. Public support for climate policy is increasing,<sup>27</sup> but the same political challenges threaten to prevent any serious federal climate legislation in the foreseeable future.

The potential political advantages of a CES are unproven at the US federal level, but various states like New York<sup>28</sup> and New Mexico<sup>29</sup> have implemented versions of a CES. For the moment, more support exists among federal policy makers for carbon taxes—proposed legislation in the House<sup>30</sup> and Senate<sup>31</sup> currently have 34 and 4 co-sponsors, respectively—though not nearly enough support to envision passage through Congress in the near future.

Inevitably, some policy makers will prefer a CES due to advantages explained in this piece, while others will prefer carbon pricing policies because they are a more cost-effective way to reduce emissions. These are policy tools, not policy objectives. Each can be scaled for greater or lesser stringency, adjusted to avoid unwanted adverse impacts, and combined with other policies to create an equitable and cost-effective portfolio of climate policies. It is easy to imagine hybrid policies that combine elements of both.

Franklin Delano Roosevelt famously said, “It is common sense to take a method and try it. If it fails, admit it frankly and try another. But above all, try something.” We do not know what climate policies will be politically feasible in the years to come, so policy makers in favor of cost-effective decarbonization should welcome proposals for both carbon prices and clean electricity standards.

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## Notes

1. <https://www.eia.gov/coal/data.php>
2. <https://www.eia.gov/tools/faqs/faq.php?id=427&t=3>
3. [https://energypolicy.columbia.edu/sites/default/files/pictures/CGEP\\_Energy\\_Environmental\\_Impacts\\_CarbonTax\\_FINAL.pdf](https://energypolicy.columbia.edu/sites/default/files/pictures/CGEP_Energy_Environmental_Impacts_CarbonTax_FINAL.pdf)
4. <https://www.wyomingminning.org/minerals/coal/coal-production-employment/>



5. <https://www.wyomingmining.org/minerals/coal/coal-production-employment/>
6. <https://www.eia.gov/outlooks/aeo/data/browser/#/?id=95-AEO2018&region=0-0&cases=ref2018-co2fee25&start=2016&end=2050&f=A&linechart=~~~~~ref2018-d121317a.71-95-AEO2018-co2fee25-d022318a.71-95-AEO2018&map=&ctype=linechart&sourcekey=0>
7. [https://www.wri.org/sites/default/files/Putting\\_a\\_Price\\_on\\_Carbon\\_Ensuring\\_Equity.pdf](https://www.wri.org/sites/default/files/Putting_a_Price_on_Carbon_Ensuring_Equity.pdf)
8. <https://energypolicy.columbia.edu/sites/default/files/Center%20on%20Global%20Energy%20Policy%20Can%20Coal%20Make%20a%20Comeback%20April%202017.pdf>
9. <https://www.eia.gov/todayinenergy/detail.php?id=37817>
10. <https://rhg.com/research/taking-stock-2018/>
11. <https://citizensclimatelobby.org/energy-innovation-and-carbon-dividend-act/>
12. <https://www.ceres.org/AirBenchmarking2018>
13. <https://rhg.com/research/taking-stock-2018/>
14. [https://energypolicy.columbia.edu/sites/default/files/pictures/DeutchCarbonTax-CGEP\\_Commentary\\_NEW.pdf](https://energypolicy.columbia.edu/sites/default/files/pictures/DeutchCarbonTax-CGEP_Commentary_NEW.pdf)
15. <https://energypolicy.columbia.edu/research/report/interactions-between-federal-carbon-tax-and-other-climate-policies>
16. [https://energypolicy.columbia.edu/sites/default/files/pictures/CGEP\\_SummaryOfCarbonTaxModeling.pdf](https://energypolicy.columbia.edu/sites/default/files/pictures/CGEP_SummaryOfCarbonTaxModeling.pdf)
17. [https://unfccc.int/files/focus/long-term\\_strategies/application/pdf/mid\\_century\\_strategy\\_report-final\\_red.pdf](https://unfccc.int/files/focus/long-term_strategies/application/pdf/mid_century_strategy_report-final_red.pdf)
18. <https://www.vox.com/energy-and-environment/2019/4/23/18507297/nuclear-energy-renewables-voters-poll>
19. [https://energypolicy.columbia.edu/sites/default/files/file-uploads/CarbonTaxPolicyInteractions-CGEP\\_Report\\_031119.pdf](https://energypolicy.columbia.edu/sites/default/files/file-uploads/CarbonTaxPolicyInteractions-CGEP_Report_031119.pdf)
20. <https://www.reuters.com/article/us-usa-election-carbon/washington-state-carbon-tax-poised-to-fail-after-big-oil-campaign-idUSKCN1NC1A9>
21. [https://energypolicy.columbia.edu/sites/default/files/pictures/CGEP\\_Commentary\\_VehicleEmissionsCarbonTax\\_.pdf](https://energypolicy.columbia.edu/sites/default/files/pictures/CGEP_Commentary_VehicleEmissionsCarbonTax_.pdf)
22. <https://energypolicy.columbia.edu/research/article/federal-us-carbon-tax-major-design-decisions-and-implications>
23. [https://energypolicy.columbia.edu/sites/default/files/pictures/DeutchCarbonTax-CGEP\\_Commentary\\_NEW.pdf](https://energypolicy.columbia.edu/sites/default/files/pictures/DeutchCarbonTax-CGEP_Commentary_NEW.pdf)



24. <https://www.washingtonpost.com/>
  25. <https://www.washingtonexaminer.com/policy/energy/daily-on-energy-murkowski-and-manchin-wont-go-for-carbon-tax>
  26. [https://energypolicy.columbia.edu/sites/default/files/pictures/CGEP\\_SummaryOfCarbonTaxModeling.pdf](https://energypolicy.columbia.edu/sites/default/files/pictures/CGEP_SummaryOfCarbonTaxModeling.pdf)
  27. <https://climatecommunication.yale.edu/publications/americans-are-increasingly-alarmed-about-global-warming/>
  28. <https://www.nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Standard>
  29. <https://www.c2es.org/document/renewable-and-alternate-energy-portfolio-standards/>
  30. <https://www.congress.gov/bill/116th-congress/house-bill/763/>
  31. <https://www.whitehouse.senate.gov/news/release/whitehouse-schatz-heinrich-gillibrand-introduce-updated-carbon-fee>
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## About the Author

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*The views represented in this commentary represent those of the author.*

*This work was made possible by support from the Center on Global Energy Policy. More information is available at <http://energypolicy.columbia.edu/about/mission>.*





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