



The Foundation *for* Research
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GENERATING EQUITY

Improving Clean Energy
Access & Affordability

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INTRODUCTION

Chairman Rush, Ranking Member Upton, and members of the Energy Subcommittee, thank you for inviting me to speak today.

Discussions about energy burden and access to cleaner forms of energy are needed and important. But these discussions must focus more attention on how policies designed to address climate change can result in higher costs for ratepayers and consumers.

I will address three issues: renewable mandates, natural-gas restrictions, and subsidies for electric vehicles.

RENEWABLE MANDATES AND PRICES

Dozens of states have implemented mandates or goals for renewable energy deployment.¹ In addition, according to the Sierra Club, “over 160 cities, more than ten counties, and eight states” have goals to power their communities solely with renewable energy.² But as states have added renewables, some have seen significant increases in electricity prices.

One of the first studies to demonstrate this phenomenon was published in 2017 by Steve F. Hayward and Peter J. Nelson for the Center of the American Experiment. Hayward and Nelson analyzed the impact that renewable-energy mandates have had on Minnesota’s ratepayers. They reported that between 1990 and 2009, the “retail price of electricity in Minnesota was, on average, 18.2 percent lower than the national average.” But as the state added increasing amounts of wind energy, that price advantage disappeared.

Hayward and Nelson found that if over the previous seven years, Minnesota had maintained its historic price advantage on electricity “the state’s consumers would have paid nearly \$4.4 billion less than what the actual cost of electricity turned out to be.” Why did Minnesota’s rates increase along with increased wind capacity? Hayward and Nelson pointed to filings made by Xcel Energy in its requests for rate increases. In one of those documents, the utility said that it had been focusing on carbon-free generation and that it had to spend on new generation units and transmission capacity to “deliver this generation to load. These investments were in addition to the capital investments we always need to make in our distribution, transmission, and generation assets to help ensure we can safely and reliably serve our customers.”

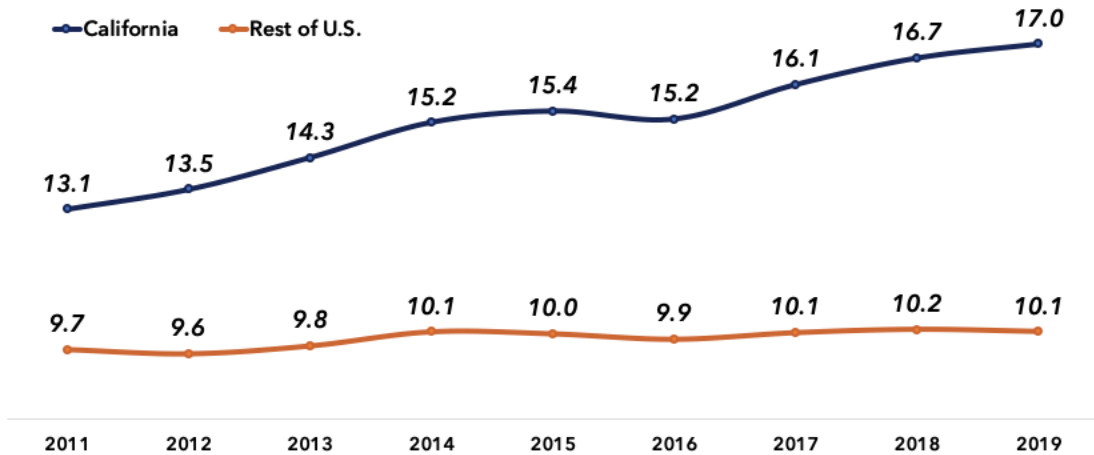
The report also points out that Xcel had to build expensive new high-voltage transmission to comply with Minnesota’s renewable-energy mandates at a cost of some \$1.8 billion. Those costs were passed on to ratepayers. Hayward and Nelson concluded that through

¹ <https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx>

² Sierra Club, “What are 100% Clean Energy Commitments?”, undated, <https://www.sierraclub.org/ready-for-100/commitments>

2017, the “cost to build out the wind farms currently serving the state’s mandate amounts to around \$10.6 billion.”³

Figure 1. California Electricity Prices vs. Rest of United States, 2011-2019
(cents per kilowatt-hour)



California’s electricity rates are rapidly rising. Since 2011, California’s electricity prices increased at a rate that was seven times as fast as the rate seen in the rest of the U.S. (Source: Energy Information Administration; Graphic: FREOPP)

CALIFORNIA: BIG MANDATES, HIGH PRICES

California has implemented some of the most aggressive renewable-energy policies. That push for renewable energy has coincided with huge increases in electricity prices. Indeed, California’s electricity rates have been rising far faster than the U.S. average.

In 2008, then-Governor Arnold Schwarzenegger signed an executive order that required the state’s utilities to obtain a third of the electricity they sell from renewables by 2020.⁴ In 2015, Gov. Jerry Brown signed a law that boosted the mandate to 50% by 2030.⁵ In 2018, California lawmakers imposed yet another mandate that requires the state’s electric

³ Steve F. Hayward and Peter J. Nelson, “Energy Policy in Minnesota: The High Cost of Failure,” Center of the American Experiment, October 2017, <https://2lffqo2moysixpyb349z0bj6-wpengine.netdna-ssl.com/wp-content/uploads/2017/10/MN-Energy-10.2017-Final.pdf>

⁴ <http://www.schwarzenegger.com/issues/milestone/protecting-the-environment-and-promoting-clean-energy>

⁵ <https://www.sfchronicle.com/business/article/California-may-reach-50-renewable-power-goal-by-12354313.php>

utilities to procure at least 60% of their electricity from renewables by 2030, and to be producing 100% “zero-carbon” electricity by 2045.⁶

The imposition of these mandates coincided with a dramatic increase in electricity prices. Between 2011 and 2019, the average price of electricity in California for all users— industrial, commercial, and residential—jumped by nearly 30 percent, or more than seven times the rate of increase seen in the rest of the U.S.⁷

MANDATES CORRELATE WITH SURGES IN ELECTRICITY PRICES

Renewable-energy proponents often claim that the price of generating electricity from wind and solar is falling. That may be true. But integrating those sources into the electric grid is expensive. Those integration costs include new wires, poles, transformers, high-voltage transmission capacity, and batteries.

All of the wind and solar capacity that gets added to the electric grid must be matched by an equal amount of traditional generation (or perhaps, batteries) to assure reliability when the sun isn’t shining or the wind isn’t blowing. This need for firm generation capacity means that utilities or grid managers must continue operating—and paying for— traditional generation units. This dynamic was explained in a 2017 analysis by James Bushnell, an economist at the University of California, Berkeley. Bushnell said that the renewable energy being added to California’s grid was driving down wholesale electricity prices. That sounds like a positive thing. But Bushnell went on to explain:

Since wholesale prices cannot support the cost of this much generation (new and old), increasingly the gap must be made up through rising margins between wholesale and retail prices. Utilities and other retailers have to pay high market prices for new renewables instead of being able to “buy low” on the wholesale market. Because all retailers face the same regulation, they pass these costs on to end-users. And this doesn’t even consider the costs of new transmission, most of which is being added to boost the power system’s ability to access and absorb large amounts of renewable energy. Transmission costs, which are also charged through to electricity end-users as part of the retail prices...will continue to grow in coming years.⁸

A 2019 study done by academics at the University of Chicago came to the same conclusions as Bushnell. The study’s authors, Michael Greenstone and Ishan Nath, found that renewable-energy mandates “raise electricity prices more than previously thought” due to “hidden costs that have typically been ignored.” It said that the mandates “come at a high cost to consumers and are inefficient in reducing carbon emissions.”

The report identified the factors that drive up the cost of power: “the intermittent nature of renewables means that back-up capacity must be added” and that “by mandating an

⁶ <https://www.sacbee.com/news/politics-government/capitol-alert/article218128485.html>
<https://www.npr.org/2018/09/10/646373423/california-sets-goal-of-100-percent-renewable-electric-power-by-2045>

⁷ <https://www.eia.gov/electricity/monthly/>

⁸ James Bushnell, “Breaking News! California Electricity Prices Are High,” Energy Institute at Haas, February 21, 2017, <https://energyathaas.wordpress.com/2017/02/21/breaking-news-california-electricity-prices-are-high/>

increase in renewable power, baseload generation is prematurely displaced, and some of the cost is passed to consumers.” It concluded that renewable-energy mandates lead to “substantial increases in electricity prices that mirror the program’s increasing stringency over time.”⁹

ONTARIO AND GERMANY SEE BIG PRICE INCREASES

The same issues—and price increases for consumers—are also apparent in Canada and Germany. In Ontario, in 2009, the provincial government launched the Green Energy Act which guaranteed long-term contracts to renewable-energy generators at prices that were well above market rates. To pay for the measure, Ontario, which is home to nearly a third of Canada’s 36 million residents, added surcharges to ratepayers’ electric bills. The province also forced the closure of coal plants, claiming that doing so would improve public health. The result: between 2008 and 2016, residential electricity rates in the province jumped by 71 percent, which was more than double the average increase in the rest of Canada over that time period.¹⁰

Germany also shows how aggressive renewable mandates push up electricity prices. Between 2000 and 2017, Germany spent about \$222 billion on renewable energy subsidies as part of its efforts to slash its greenhouse-gas emissions. The country has pledged to slash those emissions by 40 percent compared to 1990 levels, by 2020, and by 95 percent by 2050.¹¹ The total invoice for the Energiewende may total some \$500 billion by 2025 and that figure only counts the investment needed in the electricity sector.¹²

According to Agora Energiewende, a think tank that focuses on Germany’s transition toward renewables, residential electricity prices in Germany jumped by 50 percent between 2007 and 2018. The result: German residential customers now have some of the highest-priced electricity in Europe, about \$0.37 per kilowatt-hour.¹³

⁹ Michael Greenstone and Ishan Nath, “Do Renewable Portfolio Standards Deliver,” Energy Policy Institute at the University of Chicago, May 2019, <https://epic.uchicago.edu/wp-content/uploads/2019/07/Do-Renewable-Portfolio-Standards-Deliver.pdf>

¹⁰ Elmira Aliakbari, Kenneth P. Green, Ross McKittrick, and Ashley Stedman, eds., “Understanding the Changes in Ontario’s Electricity Markets and Their Effects,” Fraser Institute, April 2018, https://www.fraserinstitute.org/sites/default/files/understanding-the-changes-in-ontarios-electricity-markets-web-final_0.pdf_i.

¹¹ Stanley Reed, “Germany’s Shift to Green Power Stalls, Despite Huge Investments,” *New York Times*, October 7, 2017, <https://www.nytimes.com/2017/10/07/business/energy-environment/german-renewable-energy.html>

¹² Soren Amelang, “How much does Germany’s energy transition cost?” Cleanenergywire.com, June 1, 2018, <https://www.cleanenergywire.org/factsheets/how-much-does-germanys-energy-transition-cost>

¹³ Patrick Graichen, Alice Sakhel, and Christoph Podewils, “The Energy Transition in the Power Sector: State of Affairs in 2017,” Agora-energiewende.de, https://www.agora-energiewende.de/fileadmin/Projekte/2018/Jahresauswertung_2017/Energiewende_2017_-_State_of_Affairs.pdf, 37.

RESTRICTIONS ON NATURAL GAS ARE REGRESSIVE TAXES

Bans or restrictions on natural gas can also lead to higher prices for consumers. As I noted in a recent report for the Foundation for Research on Equal Opportunity, more than 30 local governments in California have passed bans or restrictions on the use of natural gas in buildings.¹⁴ These restrictions, which were approved by California regulators, are being done in the name of climate change and decarbonization, but they are, in practice, a form of energy taxation.¹⁵ Prohibiting the direct consumption of natural gas in furnaces, stoves, clothes dryers, and water heaters forces residential consumers to buy electricity, which in California is four times as expensive as natural gas on an energy-equivalent basis.

In 2019, the average cost of residential electricity in California was 19.2 cents per kilowatt-hour. That was the highest price in the continental U.S. outside of the Northeast.¹⁶ There are 3,412 Btu in each kilowatt-hour of electricity. Therefore, assuming a 100% efficient use of electricity, California residents are paying about \$56 per MMBtu for the electricity they consume. By contrast, the average residential price of natural gas in California in 2019 was \$13.32 per MMBtu.¹⁷ Assuming that gas is consumed in an appliance or heater that is 95% efficient, the cost of natural gas to residential consumers is about \$14 per MMBtu.¹⁸ Thus, by banning gas-fired appliances, California regulators are poised to require homeowners and renters to pay four times as much for their household energy as they would if they were consuming natural gas directly. Those higher energy costs could amount to hundreds of dollars per year for each household.¹⁹

EVS ARE FUELED BY SUBSIDIES

Electric vehicle subsidies provide another example of how climate goals are imposing costs on low- and middle-income consumers. This can be seen by once again, looking at California, where the state subsidizes the purchase of EVs. An analysis of data published by the Clean Vehicle Rebate Project shows that California Senate District 13, in the Bay Area, has collected more than 23,000 rebates from the state worth about \$55.3 million. That sum is more than what was rebated to residents of seven other senate districts in the state, *combined*.²⁰ That list includes:

- Senate District 16: \$6.1 million
- Senate District 14: \$2.2 million

¹⁴ <https://freopp.org/the-high-cost-of-california-electricity-is-increasing-poverty-d7bc4021b705>

¹⁵ <https://www.energy.ca.gov/news/2019-12/cec-approves-first-local-energy-efficiency-standards-go-beyond-2019-statewide>. Note that the CEC's says it is "leading the state to a 100 percent clean energy future. It has seven core responsibilities: developing renewable energy, transforming transportation, increasing energy efficiency, investing in energy innovation, advancing state energy policy, certifying thermal power plants, and preparing for energy emergencies."

¹⁶ <https://www.eia.gov/electricity/monthly/archive/february2020.pdf>, Table 5.6.B.

¹⁷ https://www.eia.gov/dnav/ng/ng_pri_sum_a_EPG0_PRS_DMcf_a.htm

¹⁸ <http://www.amsenergy.com/fuel-cost-calculator/>

¹⁹ <https://www.consumeraffairs.com/homeowners/gas-vs-electric-appliances.html>

²⁰ <https://cleanvehiclerebate.org/eng/cvrp-rebate-map>

- Senate District 12: \$3.6 million
- Senate District 5: \$9.1 million
- Senate District 4: \$6.7 million
- Senate District 40: \$6.5 million
- Senate District 8: \$13 million

Wealthy EV drivers have been getting subsidized for years. In 2016, two academics at the University of California, Berkeley, Severin Borenstein and Lucas W. Davis, published a paper which concluded that the majority of the money being collected under federal programs aimed at promoting energy efficiency and alternative transportation was going to wealthy Americans. They found “the most extreme disparity is in the program aimed at electric vehicles, where we find that the top income quintile has received about 90% of all credits.” They continued saying that taxpayers who had adjusted gross incomes “in excess of \$75,000 have received...about 90% of all credit dollars aimed at electric cars.”²¹

In addition to helping pay for the subsidies given to EV buyers, consumers are also facing increases in electricity rates to pay for the public charging stations needed to refuel those cars, as well as the grid upgrades that will be required to meet additional electricity demand.

The cost of EV infrastructure and the grid upgrades that will be needed to support widespread adoption of those vehicles has received scant attention. But the costs of supporting hundreds of millions of EVs will be enormous. In January, New Jersey Gov. Phil Murphy issued an executive order requiring the state’s regulators to “make sweeping regulatory reforms...to reduce emissions and adapt to climate change.” The order says the state should be running on 100-percent “clean energy” by 2050. The goals in the order include “100-percent carbon-neutral electricity generation and maximum electrification of the transportation and building sectors.”²² But shifting transportation energy use from liquid fuels to electricity and full electrification of buildings will result in dramatic increases in electricity demand.

A report published by the state that accompanied the governor’s executive order, notes that achieving the clean energy target will require doubling the state’s electricity use.²³ Accommodating such a dramatic increase, and doing so in just 30 years, will require a complete overhaul of New Jersey’s electric grid. While the final costs of such an overhaul are not known, the price tag will likely total tens of billions of dollars—all of which will have to be paid for by consumers.

²¹ <https://www.journals.uchicago.edu/doi/full/10.1086/685597>

²² <https://www.nj.gov/governor/news/news/562020/approved/20200127a.shtml>

²³ http://d31hzhk6di2h5.cloudfront.net/20200127/84/84/03/b2/2293766d081ff4a3cd8e60aa/NJBPU_EMP.pdf, see page 262, Figure J, and text which says that gas-fired generation will decline “even as total electricity use increases by more than 100%.”

CONCLUSION

In summary, efforts to increase access to cleaner energy and power sources are laudable. But while considering how to make that happen, policymakers must have frank and transparent discussions about how to lighten the energy burden, not increase it. Decarbonizing our energy and power systems cannot be done quickly or cheaply. If the goal is to decrease inequality, policymakers must be attentive so that the cost of decarbonizing America's enormous energy sector is not borne by low- and middle-income American families.