ISSUE BRIEF

CLEANING UP OUR ACT ON ENERGY AND REAPING THE BENEFITS

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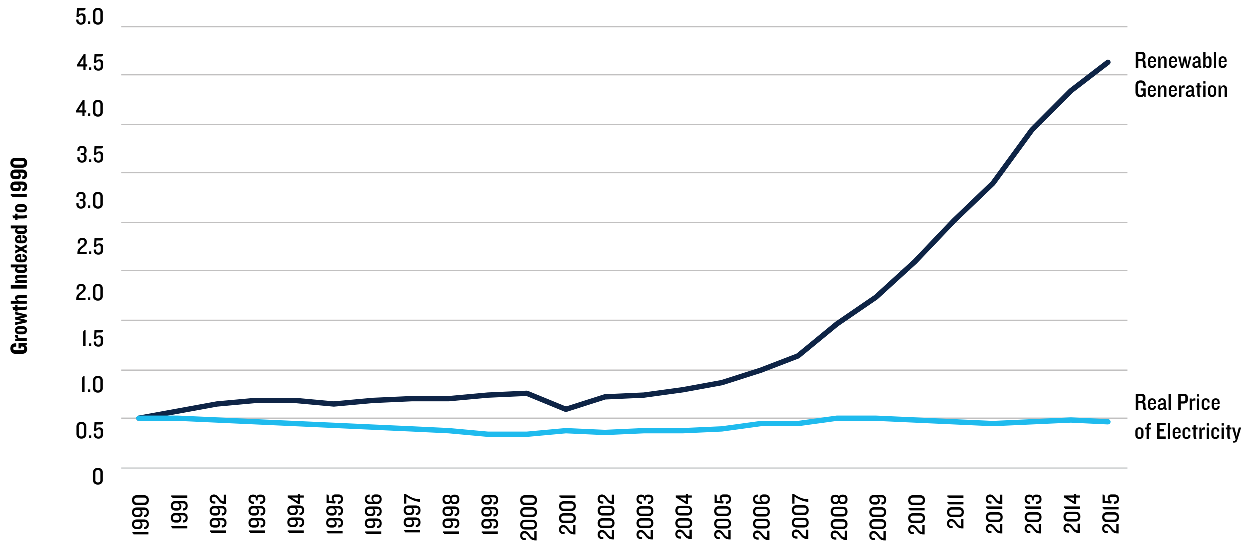
For years, skeptics have warned that a clean energy transition would drive up costs and render consumers' energy bills unaffordable.[1] They were wrong. Despite wild swings in fossil fuel prices, America's electricity bills and the per-kilowatt-hour (kWh) rates recorded on them have remained relatively stable and affordable for decades, thanks in good part to leadership at the state level in support of energy efficiency and renewable energy. Indeed, after adjusting for inflation, U.S. electricity is cheaper today than it was more than a quarter-century ago in 1990, as shown in Figure 1. At the same time, wind and solar energy—which are immune to the periodic surges that fossil fuel prices experience—raised their market share from virtually nothing to 7 percent of U.S. electricity supply. NRDC has found that the states that most conspicuously failed during this period to invest in clean energy, including renewable energy and energy efficiency, are paying for it with both higher electricity bills and greater amounts of power-plant pollution emissions from fossil fuel-fired electricity generation.

FIGURE 1: GROWTH IN AVERAGE ELECTRICITY PRICES AND GROWTH IN RENEWABLE ENERGY GENERATION[2]



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THE BIG PICTURE: FROM SEA TO SHINING SEA

NRDC analyzed the impacts of clean energy on consumer electricity costs per kWh (commonly referred to as rates) and, more important, on customers' bills. Bills are affected both by electricity rates and by consumption. For the purposes of this analysis, we limited clean energy to two principal categories:

1. Energy efficiency, also known as smarter use of energy, which inexpensively reduces the amount required to meet customers' needs; and
2. Renewable energy, mainly solar and wind, which restrains wholesale electricity prices and steadily becomes cheaper as a result of economies of scale and technology improvements. (We excluded hydropower, which has not changed significantly in magnitude or cost in recent years.)

Thanks in part to these two clean energy superheroes, America's inflation-adjusted electricity prices dropped slightly from 1990 to 2015, as shown in Figure 1.

ENERGY EFFICIENCY: SAVING CONSUMERS BILLIONS FOR DECADES

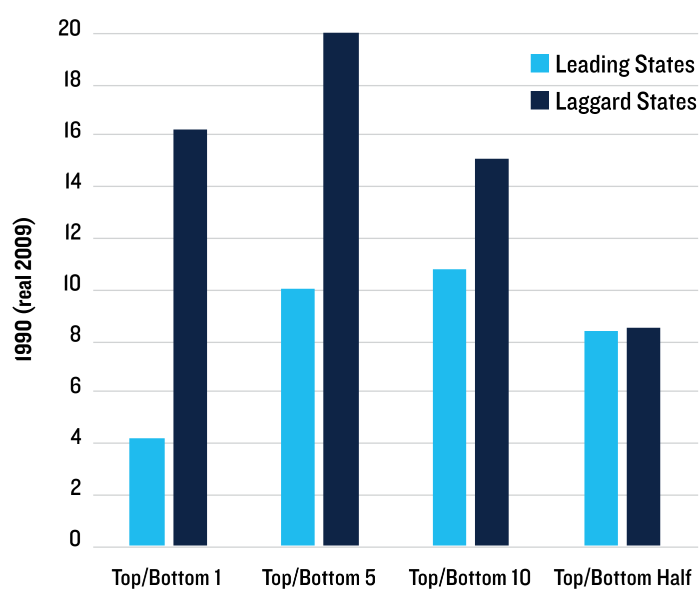
For decades, energy efficiency has decreased consumer costs.[3] When customers use less electricity, utilities don't need to buy as much fuel to generate electricity, nor do they need to build new power plants. These savings benefit all customers, whether or not they adopt more efficient technologies. When electricity needs are reduced, less fossil fuel is burned, reducing the greenhouse gas emissions that drive dangerous climate change and cutting toxic air pollutants like sulfur and nitrogen oxides.

Energy efficiency, as we know it today, began in earnest in the mid-1970s when California created a state energy commission and required phased improvements in the design of buildings and appliances such as refrigerators and furnaces, ensuring steady reductions in the quantity of energy needed to provide services on which households and businesses rely. Since then, states and utilities, as well as the federal government, have continually devised new ways to help consumers save energy. For example, according to the U.S. Department of Energy (DOE), federal efficiency standards covering more than 60 appliance and equipment product classes saved U.S. consumers more than $60 billion on their utility bills in 2015 alone. The DOE projects that these standards could pave the way to cumulative utility bill savings of nearly $2 trillion through 2030.[4] Energy savings from appliance and equipment standards and building codes have also cut the costs of building and running the electric grid. While all states have benefited, those that have been most aggressive in energy efficiency deployment—like California, Oregon, Massachusetts, and New York—have benefited the most.

Figure 2 illustrates consumer savings due to energy efficiency gains, showing that residents of states with strong energy efficiency policies reaped the most benefits. There are stark differences between the most and least energy efficient states. For example, Wyoming has historically invested very little in energy efficiency programs. In fact, it ranked dead last in a national survey by the American Council for an Energy-Efficient Economy.[5] Since 1990, Wyoming residents' monthly electric bills have risen by more than $16 (adjusted for inflation). California, on the other hand, is an energy efficiency pioneer and possibly the most efficient state.[6] Californians' electric bills increased by only about $4.25 over the same quarter-century (again, adjusted for inflation). This trend generally holds: on average, residents of the five least efficient states have seen electric bills increase twice as much as their counterparts in the top five states (see Appendix A for a full listing of the states involved). This gap is even more pronounced with regard to economy-wide electricity bills, which includes the residential, commercial, and industrial sectors. In the five least efficient states, annual per capita electricity bills, economy-wide, have increased by an average of $375, adjusted for inflation, since 1990. In the same time period, the five most efficient states have seen their bills increase by only about $40 per year, adjusted for inflation. Appendix A provides further state-by-state details. Figure 2 compares the top energy efficient states (in groups of 1, 5, and 10 states) with the least efficient, showing the average increases in residential utility bills since 1990 for each group.

States and their utilities have repeatedly demonstrated that it is cheaper to invest in energy-saving programs than to produce more electricity. A comprehensive multistate study, conducted by the Lawrence Berkeley National Laboratory in 2014, pegged the average cost of saved energy from utility energy efficiency programs at about 2 cents per kWh—a small fraction of the cost of electricity from new power plants.[8] Efficiency also reshapes the energy marketplace.

FIGURE 2: INCREASE IN RESIDENTIAL MONTHLY BILLS IN REAL DOLLARS SINCE 1990, BASED ON ENERGY EFFICIENCY PERFORMANCE[7]



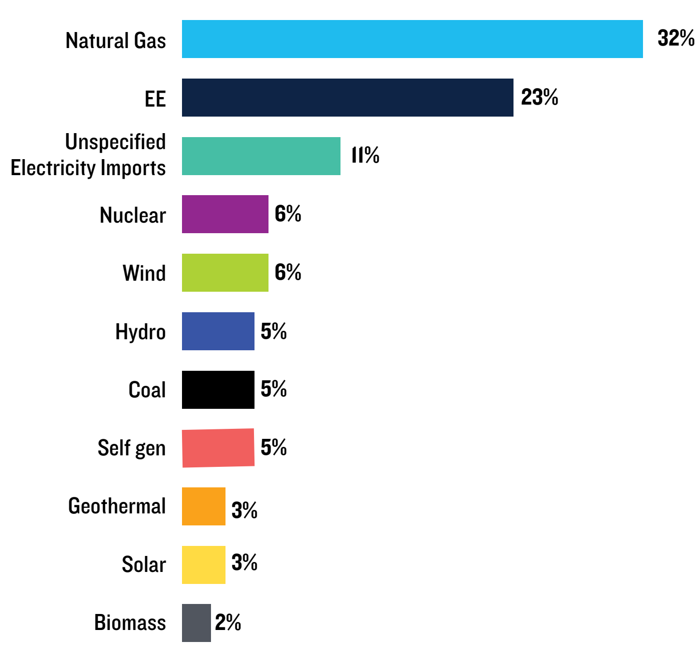
Because of reduced demand, power plants must fight harder for a share in a smaller market, driving out the most expensive and pollution-intensive resources, led by coal and oil.

After four decades of investment, California now meets almost one-quarter of its electricity needs through energy efficiency, as indicated in Figure 3. Energy efficiency is the state's second-largest electricity supply source, surpassed only by natural gas.[9] Collectively, California's energy efficiency policies have saved its residents more than $75 billion since it set the first appliance efficiency standards in 1976.[10]

California has achieved significant savings through aggressive efficiency standards for buildings (e.g., better insulation) and appliances (e.g., refrigerators). As Figure 4 demonstrates, efficiency standards have steadily reduced refrigerators' average energy consumption even as their sticker prices have dropped. Since 1987, when President Reagan signed the National Appliance Energy Conservation Act, the federal government has implemented dozens of progressively stronger efficiency standards for refrigerators. Today's new refrigerator uses as much electricity as a 50-watt lightbulb (one-fourth of what its 1973 counterpart guzzled), offers 20 percent more space, and costs half as much, after adjusting for inflation.

In the Pacific Northwest region (Oregon, Washington, Idaho, and Montana), energy efficiency has become the second-largest electricity resource after hydropower. In 2013, the average cost of efficiency improvements was about 1.7 cents per kilowatt-hour (kWh), according to the Northwest Power and Conservation Council. That's about one-fifth the cost of power from a new gas-fired plant, which can range from 7 to 10.5 cents per kWh.[13]

FIGURE 3: CALIFORNIA SUPPLY- AND DEMAND-SIDE RESOURCES THAT MEET ENERGY NEEDS IN 2015[11]



RENEWABLE ENERGY: RAPIDLY EXPANDING AND SAVING CONSUMERS BILLIONS

Utilities are increasingly embracing renewable energy, which reduces greenhouse gas emissions and is now price-competitive with fossil fuels. The transition to renewable energy began in earnest around the year 2000, in response to both federal tax incentives and state-adopted goals.

In 2015, renewable energy accounted for more than 13 percent of the nation's electricity use.[14] Since hydropower's scale and contributions have not changed substantially in recent decades, this report focuses on wind and solar energy, which contributed more than 7 percent of the nation's 2015 electricity supply, following almost 15 years of steady growth in renewable generation (see Figure 1).

New renewable energy is cheaper than other resources in many regions across the country, with solar at an average of 5 cents per kWh and wind at 2 to 2.5 cents per kWh, thanks in part to federal and state policy support.[15] As noted earlier, new gas-fired generation costs much more. And California's Diablo Canyon nuclear power plant will be retired in 2025 because the costs of operation past that year would exceed 10 cents per kWh.[16] Meanwhile, 29 states and the District of Columbia have renewable portfolio standards that require utilities to acquire a specific percentage of their electricity from renewable sources.[17]

The speed and scale of renewable energy deployment varies greatly across the states. Those that have led the way have enjoyed relatively lower electricity prices (see Figure 5). For example, Iowa has increased its percentage of renewable generation more than any other state since 2000, using new renewable resources to meet 30 percent of its electricity needs. Iowans pay only 0.6 cents more per kWh, adjusted for inflation, than they did in 2000.

These trends hold across all the combinations of best and worst performers that we analyzed. As shown in Figure 5, states that did not increase their renewable energy portfolios saw a larger increase in average electricity rates compared with those that did. We compared rate increases in the states that invested the least in renewable energy and those that invested most aggressively since 2000, using groups of 1, 5, 10, and 25 states.[18] Since 2000, every group of laggard states has underperformed relative to the corresponding group of leading states. While the least renewable-friendly states (bottom 1 and 5) saw significant residential rate increases from 2000 to 2015, households in the leading states (top 1 and 5) fared much better.

Since wind and solar power have virtually no fuel costs, grid operators always try to give them priority over power plants that cost more to run, including fossil-fueled plants. By displacing more expensive generation, renewable energy consistently reduces prices in competitive wholesale electricity markets. These reductions saved consumers up to $1.2 billion in 2013 alone, according to a report by the Lawrence Berkeley National Laboratory and National Renewable Energy Laboratory.[20]

FIGURE 4: AVERAGE HOUSEHOLD REFRIGERATOR ENERGY USE, VOLUME, AND PRICE OVER TIME[12]

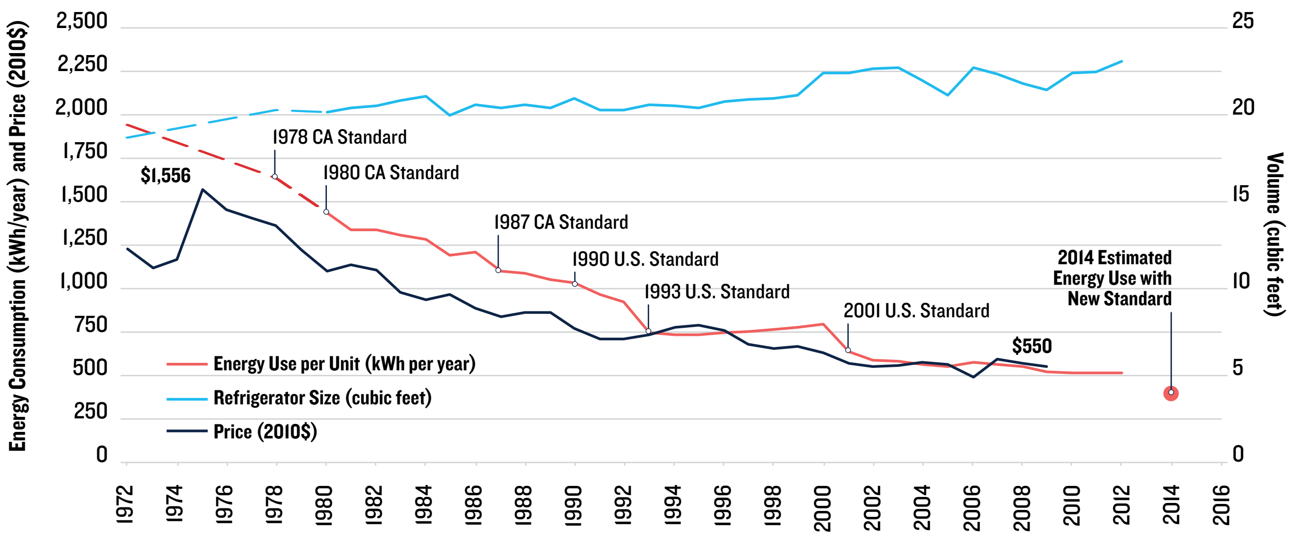
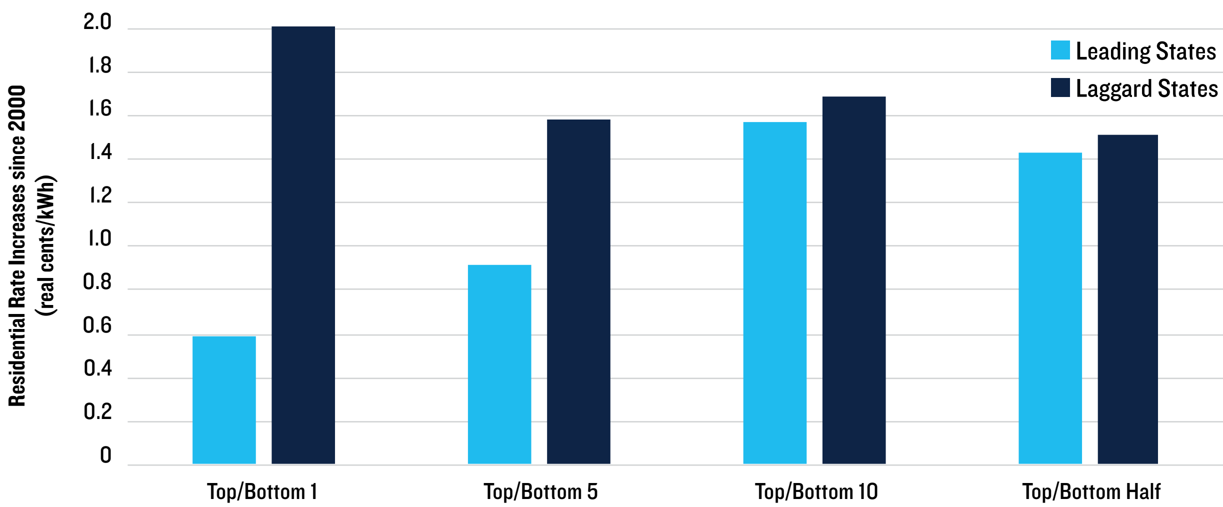


FIGURE 5: RESIDENTIAL RATE INCREASES SINCE 2000, BASED ON RENEWABLE ENERGY DEPLOYMENT[19]



As shown in Figure 6, the cost of adding solar generating capacity (in dollars per watt) has decreased substantially over the past 15 years. And the bulk of all solar generation has been added during the past five years while prices were declining.

In California, for example, it is now cheaper for utilities and others to invest in new solar or wind energy than it is to invest in natural gas, as illustrated in Figure 7.[21]

While many factors affect states' electricity prices and consumer bills, our analysis refutes claims that clean energy leadership is somehow costly to consumers or undercuts their states' competitive position. We found important differences between the leading and lagging states, all of which are ranked in Appendix A. Since the turn of the century, the leading 10 states have increased their supply of renewable energy to 22 percent, on average. Since 1990, these states have seen only a modest increase in their average electricity rates, unlike the 10 worst-performing states, and experienced greater average rate increases (see Figure 5). The environmental benefits of renewable energy leadership, including reduced air and water pollution associated with fossil generation, came even as costs remained low for utility customers.

FIGURE 6: AVERAGE COST OF LARGE-SCALE SOLAR GENERATION BASED ON LONG-TERM UTILITY PURCHASE CONTRACTS[22]

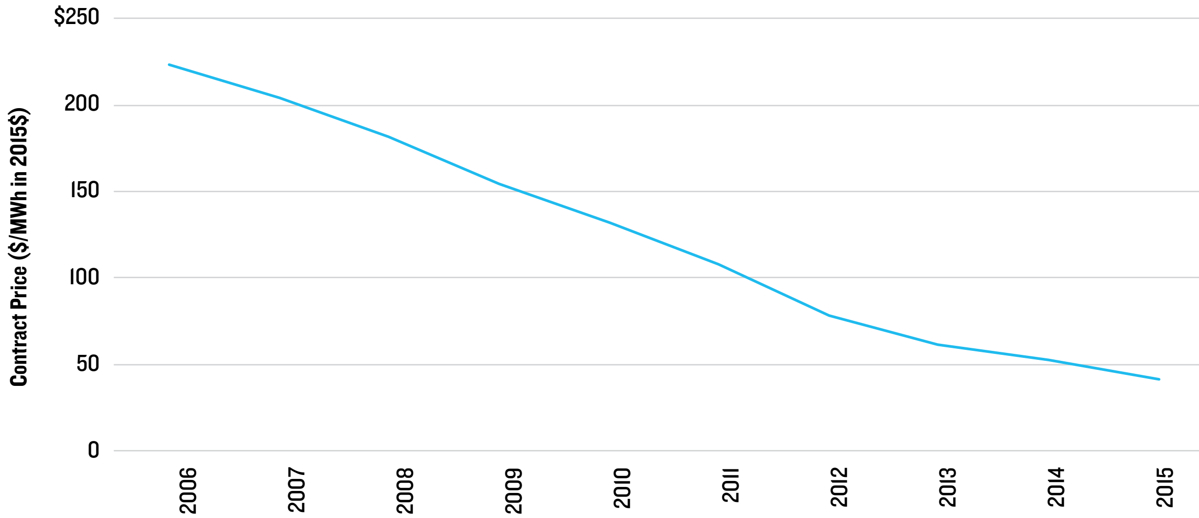
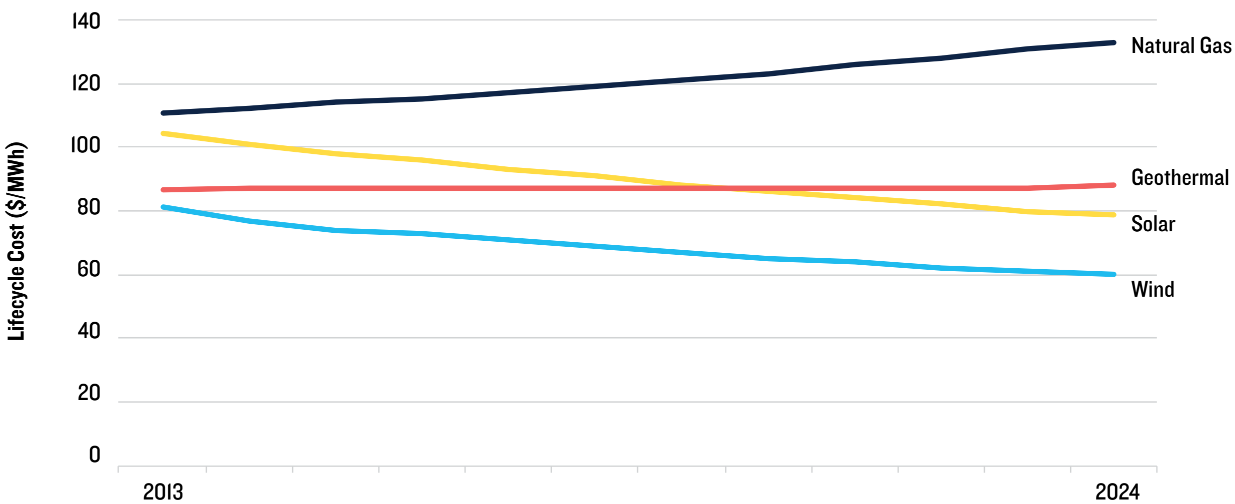


FIGURE 7: CALIFORNIA ENERGY COMMISSION ESTIMATED COSTS OF NEW RENEWABLE GENERATION COMPARED WITH NEW FOSSIL GENERATION (2015)[23]



THE TIME IS NOW: JOIN THE CLEAN ENERGY REVOLUTION

Over the past 20 years, many states have embraced the clean energy revolution, while others have hesitated. In spite of fears of increased costs for utilities and consumers, average electricity rates have actually fallen. But states that have resisted clean energy have seen cost increases, and their residents are paying higher monthly bills.

It's not too late for everyone to join the clean energy future. In fact, with renewable energy prices at all-time lows and tremendous potential for cost-effective energy efficiency, the timing has never been better. These clean energy resources offer a low-cost and lower-risk option to power any state's economy. The principal policy ingredients for success are straightforward: reward utilities that invest in energy efficiency wherever cost-effective, lock in energy efficiency gains with steady improvements in federal and state standards for buildings and equipment, and continue to source more and more electricity from renewable resources. These measures will also help states ensure compliance with the U.S. Environmental Protection Agency's (EPA) Clean Power Plan and achieve the EPA's goal of cutting cut carbon pollution by at least one-third by 2030 (compared with 2005 levels).

APPENDIX A

This appendix provides the states' energy efficiency rankings from the American Council for an Energy-Efficient Economy (ACEEE). The ACEEE scorecard is a composite ranking of performance on a number of metrics. We also provide the ranking of states according to growth in non-hydro renewable generation, which is presented as a fraction of total energy sales in each state.[24]

Historical Energy Efficiency Rank					Growth in Non-Hydro Renewable Energy as a Percent of Sales Since 2000					
1	CA	26	UT		1	IA	37%	26	WV	4%
2	OR	27	MT		2	ND	37%	27	AK	4%
3	CT	28	AZ		3	KS	28%	28	UT	3%
4	VT	29	NC		4	OK	24%	29	WI	3%
5	NY	30	DC		5	SD	21%	30	NY	2%
6	WA	31	KT		6	WY	20%	31	PA	2%
7	MA	32	DE		7	OR	16%	32	NC	2%
8	MN	33	VA		8	CO	14%	33	RI	2%
9	WI	34	SC		9	MN	14%	34	VA	1%
10	NJ	35	LA		10	MT	14%	35	MO	1%
11	RI	36	GA		11	NM	12%	36	DE	1%
12	MD	37	AK		12	ID	12%	37	OH	1%
13	ID	38	AR		13	TX	12%	38	SC	1%
14	IA	39	IN		14	NE	11%	39	GA	1%
15	HI	40	KS		15	NV	10%	40	KY	1%
16	NV	41	MI		16	VT	9%	41	NJ	0%
17	PN	42	NE		17	CA	9%	42	MD	0%
18	NH	43	OK		18	WA	8%	43	TN	0%
19	FL	44	WV		19	NH	8%	44	DC	0%
20	IL	45	MO		20	IL	8%	45	MA	0%
21	ME	46	TN		21	ME	6%	46	LA	0%
22	OH	47	MS		22	AZ	5%	47	AR	-1%
23	TX	48	SD		23	IN	5%	48	MS	-1%
24	CO	49	AL		24	HI	5%	49	FL	-1%
25	NM	50	ND		25	MI	4%	50	AL	-1%
		51	WY					51	CT	-4%

APPENDIX B

Change in average residential bills, 2000–2015, net of inflation. (Note for perspective: generally on average, per year growth is about 2 percent.)

STATE	RESIDENTIAL REAL BILL GROWTH	STATE	RESIDENTIAL REAL BILL GROWTH	STATE	RESIDENTIAL REAL BILL GROWTH	STATE	RESIDENTIAL REAL BILL GROWTH	STATE	RESIDENTIAL REAL BILL GROWTH
HI	44.05	MS	19.00	NH	12.04	KS	8.04	IA	–0.55
CT	39.43	WI	18.76	NE	11.57	ND	6.89	ME	–3.16
DC	37.05	MI	16.78	GA	10.89	OK	6.79	NC	–3.87
MA	28.74	WY	16.26	IN	10.62	UT	6.68	AR	–6.98
RI	28.36	SC	13.88	OH	10.20	VT	4.62	AZ	–8.84
WV	26.96	TN	13.64	MO	10.10	CA	4.27	IL	–11.72
MD	26.74	CO	13.55	OR	9.78	NM	3.18	LA	–14.23
AL	25.29	MT	13.51	NJ	9.23	AK	2.59		
NV	24.42	MN	12.92	TX	8.93	FL	0.70		
KY	21.78	NY	12.91	VA	8.18	ID	0.69		
DE	20.29	PA	12.63	SD	8.07	WA	–0.15		

ENDNOTES

1 *See, e.g.*, Hanson, C.H., “Bureaucrats Are Boosting Your Utility Bill,” Forbes, April 7, 2014, http://www.forbes.com/sites/realspin/2014/04/07/bureaucrats-are-boosting-your-utility-bill/#39df91e0549e; American Coalition for Clean Coal Electricity, “Get the Facts About Coal-Based Electricity,” America’s Power, n.d., http://www.americaspower.org/ (contending that coal-based electricity is inherently more affordable than cleaner competitors); and Palmer, F.D.,” Twenty First Century Coal, Policy Parity and Technology,” Platt’s 24th Annual Coal Properties and Investment Conference, Fort Lauderdale, March 21, 2016; http://totalspectrumsga.com/files/content/press/FDP_-_Platts_Mar_2016-_21st_Century_Coal%2C_Policy_Parity_and_Technology_comp.pdf (arguing that California and other climate policy leaders have driven up electricity costs and poverty rates in recent decades with “anti-coal” policies).

2 U.S. Energy Information Administration (hereinafter EIA), Table 9.8, “Average Retail Prices of Electricity,” Monthly Energy Review, July 26, 2016, http://www.eia.gov/totalenergy/data/monthly/#prices. Nominal prices converted to real prices using: U.S. Bureau of Economic Analysis, National Economic Accounts, “Current-Dollar and ‘Real’ Gross Domestic Product,” July 2016, http://www.bea.gov/national/xls/gdplev.xls. Renewable generation from: U.S. EIA, Table 7.2a, “Electricity Net Generation: Total (All Sectors),” Monthly Energy Review, July 26, 2016.

3 *See, e.g.*, Billingsley, M., et al., “The Program Administrator Cost of Saved Energy for Utility Customer–Funded Energy Efficiency Programs,” Lawrence Berkeley National Laboratory, March 2014; Northwest Power and Conservation Council, “Energy Efficiency,” September 2016, https://www.nwcouncil.org/energy/energy-efficiency/home/.

4 U.S. Department of Energy (hereinafter DOE), “Saving Energy and Money with Appliance and Equipment Standards in the United States,” February 2016, http://energy.gov/sites/prod/files/2016/02/f29/Appliance%20Standards%20Fact%20Sheet%20-%202-17-2016.pdf.

5 Our methodology for ranking states’ energy efficiency performance is based on the American Council for an Energy-Efficient Economy’s earliest annual rankings that contain energy savings data (ACEEE’s 2008 rankings, which include data from earlier years) in order to capture the greatest cumulative impact of energy efficiency savings over time. Wyoming ranked in last place in 2008 and 2009 and was second-to-last in 2006.

6 California was ranked first in ACEEE’s 2006, 2008, and 2009 energy efficiency rankings.

7 Monthly bill data: U.S. EIA, “Electric Sales, Revenue, and Average Price, 1990–2014,” EIA-861 data file, October 2015, https://www.eia.gov/electricity/sales_revenue_price/. Nominal prices converted to real prices using: U.S. Bureau of Economic Analysis, National Economic Accounts, “Current-Dollar and ‘Real’ Gross Domestic Product.” Energy efficiency rank based on ACEEE’s rankings, *supra* note 5. For the states in each tier, see Appendix A.

8 See Billingsley, M., “The Program Administrator Cost of Saved Energy.”

9 The only resource to top energy efficiency in magnitude is electricity from natural gas plants.

10 California Energy Commission (hereinafter CEC), “Tracking Progress—Energy Efficiency,” December 2015, http://www.energy.ca.gov/renewables/tracking_progress/documents/energy_efficiency.pdf.

11 Energy efficiency data from: CEC, “California Energy Demand 2016–2026 Adopted Forecast, Committed Electricity Efficiency Conservations Savings by Planning Area and Sector Mid CORRECTED,” January 2016, http://www.energy.ca.gov/2015_energypolicy/documents/2016-01-27_electricity_efficiency_savings.php. Supply-side resources from: CEC, “Total Electricity System Power,” 2015, http://energyalmanac.ca.gov/electricity/total_system_power.html. Self-generation from CEC, “Mid Case Final Baseline Demand Forecast, Statewide Mid Demand Case,” Form 1.2, January 2016, http://www.energy.ca.gov/2015_energypolicy/documents/2016-01-27_mid_case_final_baseline_demand_forecast.php. Note that this accounting includes both supply- and demand-side resources. Energy efficiency is a demand-side resource that represents the absence of generating (and consuming) energy. To derive these portions of total energy needs met, we included both demand- and supply-side resources in the denominator.

12 From Bipartisan Policy Center, Strategic Energy Policy Initiative, “America’s Energy Resurgence: Sustaining Success, Confronting Challenges,” February 2013, http://bipartisanpolicy.org/wp-content/uploads/sites/default/files/files/BPC%2520SEPI%2520Energy%2520Report%25202013%5B1%5D-1.pdf. Note that the left-hand Y-axis represents two variables: energy use and price. They both happen to fit on the same scale.

13 Northwest Power and Conservation Council, *Sixth Northwest Conservation and Electric Power Plan*, February 2010, https://www.nwcouncil.org/media/6284/SixthPowerPlan.pdf. See also: Harrison, J., “”Energy Efficiency Improvements in 2013 Add to Impressive Regional Savings,” Northwest Power and Conservation Council, October 7, 2014, https://www.nwcouncil.org/news/blog/energy-efficiency-saved-ratepayers-35-billion-in-2013/.

14 EIA, “Total Energy,” Monthly Energy Review, September 2016, http://www.eia.gov/totalenergy/data/monthly/#electricity.

15 Berkeley Lab, “Price of Solar Energy in the United States Has Fallen to 5¢/kWh on Average,” news release, September 30, 2015, http://newscenter.lbl.gov/2015/09/30/price-of-solar-energy-in-the-united-states-has-fallen-to-5%C2%A2kwh-on-average/. While these figures include the benefits of government subsidies, so do the market prices for all other energy resources, which also receive substantial government subsidies. For example, the federal Price-Anderson Act shifts much of the potential cost of nuclear disasters to the public. For an accounting of this and other nuclear power subsidies, *see:* Bradford, P., “No More Taxpayer Subsidies for Our Failing Nuclear Reactors!” Ecologist, August 25, 2016, http://www.theecologist.org/blogs_and_comments/commentators/2988048/no_more_taxpayer_subsidies_for_our_failing_nuclear_reactors.html. For a comparison of unsubsidized and subsidized renewable prices, *see:* Lazard, “Lazard’s Levelized Cost of Energy Analysis,” version 9.0, November 2015, https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf. *Also see:* Berkeley Lab, “Study Finds That the Price of Wind Energy in the United States Is at an All-Time Low, Averaging Under 2.5¢ per kWh,” news release, August 10, 2015, http://newscenter.lbl.gov/2015/08/10/study-finds-that-the-price-of-wind-energy-in-the-united-states-is-at-an-all-time-low-averaging-under-2-5%C2%A2kwh/. Also see: LBNL 2015 Wind Technologies Market Report, August 2016, https://emp.lbl.gov/publications/2015-wind-technologies-market-report.

16 Cavanagh, R., “Important Deadline for California Nuclear Plant Retirement,” NRDC Expert Blog, September 14, 2016, https://www.nrdc.org/experts/ralph-cavanagh/important-deadline-california-nuclear-plant-retirement-0.

17 U.S. DOE, Dsire, and NC Clean Technology Center, “Renewable Portfolio Standard Policies,” August 2016, http://ncsolarcen-prod.s3.amazonaws.com/wp-content/uploads/2014/11/Renewable-Portfolio-Standards.pdf.

18 We use growth in renewable generation as a percentage of sales to differentiate among states, benchmarked from 2000.

19 Renewable generation, sales, and rate data: U.S. EIA, “Electric Sales, Revenue, and Average Price, 1990–2014.” Nominal prices converted to real prices using: U.S. Bureau of Economic Analysis, National Economic Accounts, “Current-Dollar and ‘Real’ Gross Domestic Product,” July 2016. U.S. EIA, Monthly Energy Review (July 2016). Rank based on change in renewable generation as a percentage of total sales. Residential rate increases averaged over groups of states weighted by residential sales. Appendix A provides the state-by-state rankings.

20 Wiser, R., et al., “A Retrospective Analysis of the Benefits and Impacts of U.S. Renewable Portfolio Standards,” Lawrence Berkeley National Laboratory and National Renewable Energy Laboratory, January 2016, https://emp.lbl.gov/sites/all/files/lbnl-1003961.pdf. All generators that bid successfully to operate in wholesale power markets get paid the same hourly price as the most expensive electricity needed to meet demand at that time; this is known as the “market clearing” price. As more cheap renewable energy enters the market, this “market clearing” price is driven down, reducing the hourly cost of power to consumers regardless of the source.

21 Rhyne, I., J. Klein, and B. Neff, “Estimated Cost of New Renewable and Fossil Generation in California,” CEC, March 2015, http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-03/TN203798_20150309T154237_Estimated_Cost_of_New_Renewable_and_Fossil_Generation_in_Califo.pdf.

22 Bolinger, Mark and Seel, Joachim. “Utility-Scale Solar 2015: An Empirical Analysis of Project Cost, Performance, and Pricing Trends in the United States,” Lawrence Berkeley National Laboratory, 2016, http://emp.lbl.gov/projects/solar.

23 Rhyne, I., J. Klein, and B. Neff, “Estimated Cost of New Renewable and Fossil Generation in California.” Includes benefits from federal tax subsidies for renewable generation and embedded subsidies for fossil generation. Costs are estimated using CEC cost of generation model. Utilities around the country, not just in California, are finding that wind and solar make economic sense. See: https://www.snl.com/interactivex/article.aspx?id=36395177.

24 This table calculates the change in non-hydro renewable generation sited in each state (using EIA’s definition, which includes wind, solar, geothermal, wood, and other forms of biomass) as a percent of total sales. This metric does not fully capture the progress of states that import significant amounts of renewable energy. Analysis of renewable generation impacts on electricity rates begins with the year 2000, because before that in most states non-hydro renewables had minimal presence. Energy efficiency impacts on electricity bills began showing up much earlier, and our analysis tracks state-by-state impacts starting in 1990, using performance rankings from the earliest comprehensive assessment available from ACEEE (published in 2008).