



# BENCHMARKING UTILITY CLEAN ENERGY DEPLOYMENT: 2014

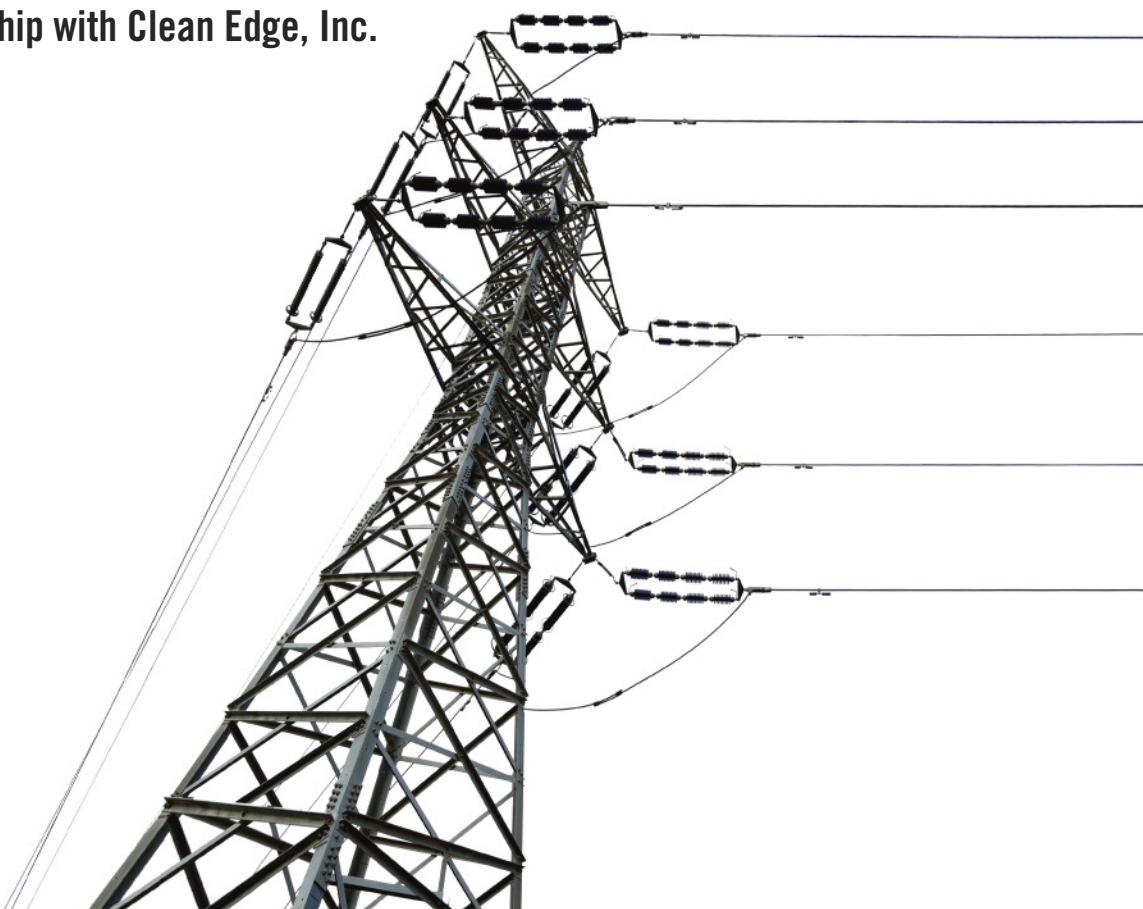
Ranking 32 of the Largest U.S. Investor-Owned Electric  
Utilities on Renewable Energy & Energy Efficiency



Ceres, Inc., in partnership with Clean Edge, Inc.



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## About Ceres

Ceres is a nonprofit organization mobilizing business and investor leadership on climate change, water scarcity and other sustainability challenges. Ceres directs the Investor Network on Climate Risk, a network of over 110 institutional investors with collective assets totaling more than \$13 trillion. For more information, visit [www.ceres.org](http://www.ceres.org) or follow Ceres on Twitter: @CeresNews

## About Clean Edge, Inc.

Clean Edge, Inc., founded in 2000, is the world's first research and advisory firm devoted to the clean-tech sector. The company offers a suite of benchmarking services, including clean-energy stock indexes, the U.S. Clean Tech Leadership Index (tracking state and metro activity), and the Benchmarking Utility Clean Energy report with Ceres. Clean Edge conducts custom consulting work for companies, investors, NGOs, and governments, providing timely research, trending analysis, and actionable insights. Managing director Ron Pernick and senior editor Clint Wilder are coauthors of two business books, *The Clean Tech Revolution* (HarperCollins, 2007) and *Clean Tech Nation* (HarperCollins, 2012). To keep abreast of the latest clean-tech trends or learn more about Clean Edge, visit [www.cleantech.com](http://www.cleantech.com).

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# Consumer Choices are Transforming the U.S. Electricity Landscape

U.S. electricity consumers today face an expanding array of choices for managing their energy bills and obtaining targeted energy services in the quantity, quality, and locations that they desire. From distributed generation, like solar photovoltaic (PV) systems, to more efficient end use technologies like LED lighting, to the virtually ubiquitous controls for all of their energy using devices, thanks to the “internet of things,” these consumer choices are transforming the U.S. electric energy landscape.

Shifting demographics, strengthened environmental policies and escalating competition add to the factors pressuring the traditional electric utility industry as it enters what may be the most tumultuous period in its history. This is leading many electric utilities to reevaluate their business models and operations. These factors are part of a major transition as the U.S. utility industry moves from one dominated by vertically integrated, rate-regulated monopolies to a market-based, competitive system in which efficiencies are largely driven by consumer market choices.

The U.S. Environmental Protection Agency’s recently proposed Clean Power Plan is only the latest in a series of events establishing a long-term preference for low-carbon energy in the U.S. Two of the plan’s four key building blocks involve electric utility deployment of renewable energy and energy efficiency, the subject of this report.

How consumers, traditional electric utilities, regulators, policy makers, and other key stakeholders adapt to this new reality—how they approach scaling up clean energy while supporting innovation, competition and customer choice—will largely determine what our energy future looks like.

This transition is already well underway, but is not yet a *fait accompli*. Renewable energy is meeting an increasingly larger share of our energy needs. As indicated in this report, NV Energy, accounting for 95 percent of electric

energy sold in Nevada, in 2012 provided over 21 percent of that energy from renewable energy sources. Renewables—including wind, solar, biomass, geothermal, waste heat and small-scale hydroelectric—accounted for a whopping 49 percent of new U.S. electric generating capacity in 2012, with new wind development outpacing even natural gas.<sup>1</sup> But much more work needs to be done to solidify the transition to a cleaner, smarter, more resilient energy future.

***“Ignoring this clean energy shift is dangerous, for both the traditional utility business and the environment. The U.S. Department of Energy recently found that renewables could feasibly provide 80 percent of the nation’s energy by 2050.”***

The different components of clean energy—energy efficiency, demand response, renewable energy, distributed generation, and the “smart” infrastructure required to integrate and optimize them—are critical elements of the 21st century electricity market. Traditional utilities and third parties will compete to offer consumers a range of customized energy-related products and services that extends far beyond today’s electricity service—and probably sooner than we think.

Ignoring this clean energy shift is dangerous, for both the traditional utility business and the environment. The U.S. Department of Energy recently found that renewables could feasibly provide 80 percent of the nation’s energy by 2050. The main obstacle is not the price tag (which is comparable to a business-as-usual scenario) or the technical challenges, though both are considerable. Rather, it is largely a question of leadership, market structures and political will.

Consumers must hold traditional electric utilities and their regulators accountable and insist upon accelerating the deployment of clean energy resources and managing the transition to distributed generation and more open, competitive electricity markets. Transparency, and better availability of energy data are key to this process. This inaugural *Benchmarking Utility Clean Energy Deployment* report from Ceres and Clean Edge is a valuable and much-needed tool to guide electric consumers in shepherding this historic transition.

1 Clean Edge, Inc., “Clean Energy Trends 2013,” March 2013, <https://cleanedge.com/reports/Clean-Energy-Trends-2013>.

# Benchmarking Utility Clean Energy Deployment

At a time of unprecedented challenge for U.S. electric utilities, renewable energy and energy efficiency have become increasingly important elements of the U.S. electricity system. Until now, however, there has been no single source of information on how U.S. electric utilities rank in terms of deploying these clean energy solutions.

This first-of-its-kind report by Ceres and Clean Edge is meant to help close that gap. *Benchmarking Utility Clean Energy Deployment* assembles data from more than 10 sources, including state Renewable Portfolio Standard (RPS) annual reports, U.S. Securities and Exchange Commission 10-K filings and Public Utility Commission reports, to show how 32 of the largest U.S. investor-owned electric utility holding companies stack up on renewable energy and energy efficiency.<sup>2</sup> These parent holding companies represent over 80 subsidiary operating companies scattered throughout the U.S. and collectively account for about 68 percent of total 2012 U.S. retail electricity sales.<sup>3</sup>

While these companies differ widely in size, geography, resource profiles and ownership of generation assets, they all share an obligation to provide the public with safe and reliable service at reasonable rates, and a responsibility for maintaining and modernizing the electric distribution grid. As such, they have a vital role to play in enabling the widespread deployment of clean energy.

Benchmarking these utilities provides an opportunity for transparent reporting and analysis of important industry trends. It fills a knowledge gap by offering utilities, regulators, investors, policymakers and other stakeholders

consistent and comparable information on which to base their decisions. And it provides perspective on which utilities are best positioned in a shifting policy landscape that includes the Environmental Protection Agency's newly released carbon pollution limits for existing power plants.<sup>4</sup> These power plants are the largest source of carbon pollution in the United States and account for one of every 15 tons of carbon pollution globally.<sup>5</sup>

## Company Rankings

Companies were benchmarked on three key indicators of clean energy deployment: 1) Renewable energy sales, or the total amount of renewable electricity sold to retail customers; 2) Cumulative annual energy efficiency savings; and 3) Incremental annual energy efficiency savings, or the energy savings from new programs or new participants in existing programs. All three indicators are provided as a percentage of annual retail sales to allow for comparison across utilities of different sizes. This report focuses on the amount of renewable energy delivered from electric utilities to their customers, and does not cover independent power producers. Since states have different approaches to defining and tracking renewable energy, the renewable energy sales findings in this report are not intended to be a yardstick of a utility's compliance with its state renewable portfolio standards. Nevertheless, the renewable energy sales data provided in this report are a strong indicator of the utilities' clean energy deployment.

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<sup>2</sup> We excluded from this report two large electric utility holding companies, Energy Future Holdings and Reliant Energy, because little if any data about their clean energy performance could be found.

<sup>3</sup> Collectively, these 32 IOUs sold 2.19 billion megawatt-hours (MWh) of electricity in 2012, compared with total U.S. retail electricity sales of 3.18 billion MWh for the year; see U.S. Energy Information Administration (EIA), "Electric Power Monthly-Table 5.1," May 2013.

<sup>4</sup> For more information about EPA's proposed carbon pollution standard, see <http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule>.

<sup>5</sup> Calculation based on 2011 EIA data.

Wide disparities were found in the extent to which electric utilities currently deliver renewable energy and energy efficiency, the cornerstone resources of a sustainable 21st century electric power sector. For example, five of the 32 companies included in this report accounted for nearly 54 percent of renewable energy sales.

**NV Energy, Xcel Energy, PG&E, Sempra Energy and Edison International ranked the highest for renewable energy sales**, with renewable resources accounting for roughly 17 to 21 percent of their retail electricity sales in 2012. SCANA, Southern Company, Dominion Resources, AES and Entergy ranked at the bottom, with renewable energy sales accounting for less than two percent of each of their total retail electricity sales.

**Energy efficiency top performers included PG&E, Edison International and Northeast Utilities**, each of whose cumulative annual energy efficiency savings was equivalent to 16 to 17 percent of their annual retail electric sales in 2012. **Pinnacle West, Sempra Energy, Portland General Electric, Puget Sound Energy and Northeast Utilities** performed the best on incremental energy efficiency savings. Each achieved savings of approximately 1.5 percent of retail electric sales, or higher, which EPA estimates is achievable in its recently proposed Clean Power Plan.

Bottom ranking companies on energy efficiency included PSEG, SCANA, Pepco Holdings, Dominion Resources and Entergy. Cumulative annual energy efficiency savings for each of these companies accounted for less than one percent of their annual retail sales. Similarly, bottom performers on incremental energy efficiency included Dominion Resources, PSEG, Entergy, FPL and Southern Co.

**Figure ES-1: Top Ranked U.S. Investor-Owned Electric Utilities on Clean Energy Deployment**

Utility Rank	Renewable Energy Sales (% of 2012 retail electric sales)	Cumulative Annual Energy Efficiency (% of 2012 retail electric sales)	Incremental Annual Energy Efficiency (% of 2012 retail electric sales)
1	NV Energy (21.08)	PG&E (17.18)	Pinnacle West (1.77)
2	Xcel Energy (18.11)	Edison International (16.87)	Sempra Energy (1.67)
3	PG&E (16.87)	Northeast Utilities (16.46)	Portland General Electric (1.47)
4	Sempra Energy (16.86)	Sempra Energy (12.54)	Puget Sound Energy (1.47)
5	Edison International (16.67)	Xcel Energy (10.62)	Northeast Utilities (1.46)

Source: Ceres and Clean Edge, for data sources see Appendix B.


**Figure ES-2: Lowest Ranked U.S. Investor-Owned Electric Utilities on Clean Energy Deployment**

Utility Rank	Renewable Energy Sales (% of 2012 retail electric sales)	Cumulative Annual Energy Efficiency (% of 2012 retail electric sales)	Incremental Annual Energy Efficiency (% of 2012 retail electric sales)
28	Entergy (0.64)	PSEG (0.90)	Southern Co. (0.21)
29	AES (0.53)	SCANA (0.84)	FPL (0.19)
30	Dominion Resources (0.52)	Pepco Holdings (0.73)	Entergy (0.06)
31	Southern Co. (0.05)	Dominion Resources (0.41)	PSEG (0.05)
32	SCANA (0.0)	Entergy (0.13)	Dominion Resources (0.03)

Source: Ceres and Clean Edge, for data sources see Appendix B.

## Other Key Findings

- ▶ **State policies are a key driver in utility clean energy investment.** The top-performing utilities on renewable energy sales are typically based in regions with aggressive policy goals, while utilities delivering the lowest amounts of renewable energy to their customers are mostly located in the Southeast, which historically has had weak state-level support for clean energy.
  - Similarly, all of the top performing utilities on energy efficiency are located in states with strong efficiency policies, including California, Connecticut, Massachusetts and Oregon.
  - The EPA's new proposed standard for reducing carbon pollution from power plants will provide further incentive for states to improve utility clean energy performance.
- ▶ **Two of the U.S. EPA's Clean Power Plan's building blocks, energy efficiency and renewable energy, are increasingly economically feasible options for electric utilities.** Energy efficiency is the lowest-cost energy resource and the cost of renewable energy continues to decline dramatically and is quickly becoming cost-competitive with fossil fuels.
- ▶ Even among companies in similar market and regulatory environments, however, there is a range of performance, suggesting that **strong state-level policies are not the only factor in utility investment in clean energy.**
- ▶ **Performance in the benchmarking report is not the only measure of clean energy leadership, which should include support for clean energy policies.** For example, National Grid has been an outspoken supporter of energy efficiency, while FirstEnergy has been a vocal critic of Ohio's energy efficiency policy.<sup>6</sup>
- ▶ **Discrepancies between utility benchmarking performance and actual on-the-ground actions highlight shortcomings with data quality and benchmarking efforts.** For example, at least one company reported here has taken public credit for energy savings by industrial customers when the utility was not involved in the efficiency projects.
- ▶ **Customers are increasingly in the driver's seat in influencing clean energy policymaking.** In a sign of this trend, a few of the top clean energy utilities in this report are facing customer pressure for not being clean enough. Cities and counties within the service area of these utilities have are actively pursuing plans to establish their own power purchasing entities in response to customer demand for expanded clean energy options
- ▶ **Better, more up-to-date data is paramount.** Data on utility clean energy deployment is too scattered among numerous sources, as outlined in *Data Sources, Issues and Quality* on page 23. Forming a complete and uniform picture of how utilities compare is critical given the rapid expansion of energy efficiency and renewable energy in the U.S. and the importance of carbon-free renewable generation to this industry. The report's Conclusion (page 24) offers specific recommendations on how federal and state agencies, utilities, regulators and other stakeholders can improve the quality and availability of utility clean energy data.



The top-performing utilities on renewable energy sales are typically based in regions with aggressive policy goals.

6 See <https://www.ase.org/news/diverse-commission-unveils-plan-double-us-energy-productivity> and <http://www.craigslist.com/article/20130426/BLOGS05/130429867&template=printart>

# Context: Increasing Clean Energy Deployment in an Electricity Sector in Transition

Renewable energy resources, along with natural gas, are now the largest sources of new energy in the U.S., and energy efficiency investment has reached historic levels. This has occurred, in part, due to strong policy support for clean energy and significant cost reductions in some renewable technologies. Greater clean energy deployment, however, is beginning to disrupt the business model for traditionally regulated electric utilities which must be addressed if global clean energy investment is to reach the levels necessary to avert the worst impacts of climate change.

## Closing the Global Clean Energy Investment Gap: The Clean Trillion

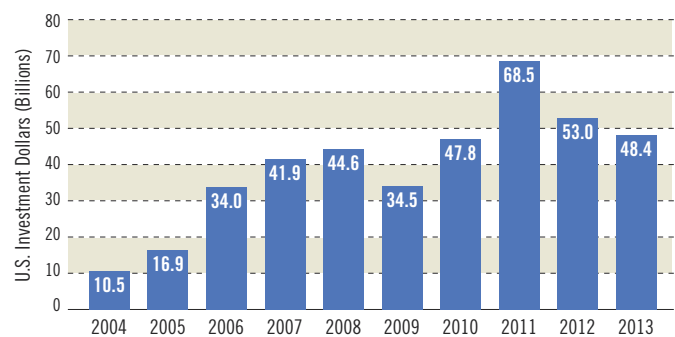
Scientists' calls to reduce global warming pollution have grown louder and more urgent in recent months. In March 2014, United Nations Intergovernmental Panel on Climate Change (IPCC) identified melting ice caps, rising sea levels, stressed water and food supplies, and more extreme weather as major impacts already evident from climate change, and predicted that the severity of these impacts will likely increase if global warming emissions are not reduced substantially.<sup>7</sup> Echoing global concerns, the third U.S. National Climate Assessment, released in May 2014, enumerated troubling domestic climate trends and adverse near- and longer-term impacts across regions and economic sectors.<sup>8</sup>

Under current policy and investment level scenarios, global energy demand and carbon emissions are both forecast to

double by 2050. To avoid potential environmental and economic catastrophe, the International Energy Agency (IEA) has called for annual global clean energy investments to double to \$500 billion by 2020, and then double again to \$1 trillion by 2030.<sup>9,10</sup> This level of investment, referred to as the *Clean Trillion*, would greatly increase the chance of limiting long-run global temperature increase to 2 degrees Celsius, a level that scientists believe is safer, according to IEA.

Global clean energy investment has actually *fallen* in each of the last two years, according to Bloomberg, from a high of \$318 billion in 2011, to \$286 billion in 2012 and \$254 billion in 2013.<sup>11</sup> U.S. clean energy investment mirrors global trends (see **Figure 1**).

**Figure 1: Total New U.S. Investment in Clean Energy—2004-2013**



Source: Bloomberg Finance L.P. and the Business Council for Sustainable Energy

7 Intergovernmental Panel on Climate Change (IPCC), "Climate Change 2014: Impacts, Adaptation and Vulnerability – Summary for Policymakers," March 31, 2013, [http://www.ipcc-wg2.gov/AR5/images/uploads/IPCC\\_WG2AR5\\_SPM\\_Approved.pdf](http://www.ipcc-wg2.gov/AR5/images/uploads/IPCC_WG2AR5_SPM_Approved.pdf).

8 For more information about the National Climate Assessment, see <http://www.globalchange.gov/>.

9 "New IEA report shows technology can transform energy system but emphasises need for decisive policy action now," International Energy Agency press release, June 11, 2012, <http://www.iea.org/newsroomandevents/pressreleases/2012/june/name.27474.en.html>.

10 Ceres has launched the Clean Trillion initiative to encourage investors and businesses to increase clean energy investment commensurate with this challenge; see <http://www.ceres.org/issues/clean-trillion/clean-trillion>.

11 Bloomberg Finance L.P. and the Business Council for Sustainable Energy, "Sustainable Energy in America: 2014 Factbook," February 2014, <http://www.bcse.org/factbook/pdfs/2014%20Sustainable%20Energy%20in%20America%20Factbook.pdf>.



Simply put, there is a clean energy investment gap, in the U.S. and globally, that must be addressed to avoid the worst impacts of climate change. Closing this gap—achieving the Clean Trillion—means that the traditional utility business model, which has long been based on selling more electricity from large centralized power plants, must transform (see “Disruptive Challenges Facing Electric Utilities,” p. 11).

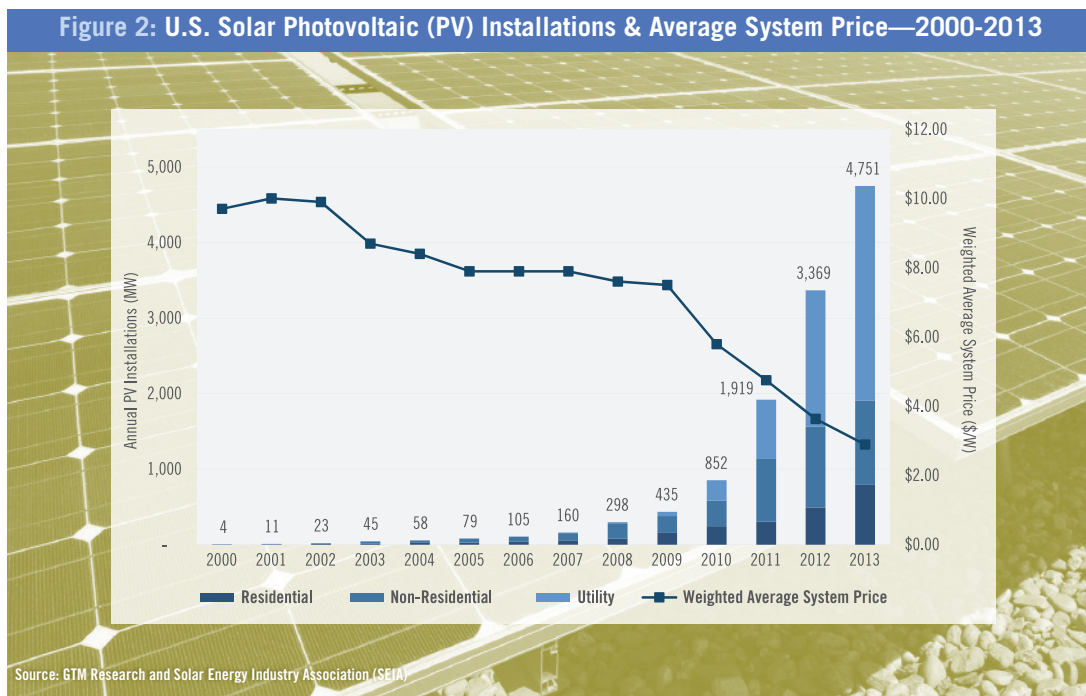
Investors, whose financial interest in electric utilities reaches into the trillions of dollars, have a strong interest in utilities’ ongoing financial viability and in their transition to sustainable business models.

This *Benchmarking Utility Clean Energy Deployment* report shows wide disparities in the extent to which electric utilities currently earn revenues from renewable energy and energy efficiency, the cornerstone resources of a sustainable 21st century electric power sector.

## U.S. Clean Energy Growth

Renewable energy has grown dramatically in the U.S. in recent years. Solar energy is now the fastest-growing U.S. energy source. The U.S. added about 4,750 megawatts (MW) of solar photovoltaic (PV) capacity in 2013, a 41 percent increase over 2012—and roughly 15 times the amount installed in 2008.<sup>12</sup> A major driver of this growth has been steep cost reductions for solar PV systems, as pictured in **Figure 2**.<sup>13</sup> At year-end 2013, cumulative PV capacity in the U.S. stood at 12.1 gigawatts (GW), with concentrating solar capacity at 918 MW.<sup>14</sup>

Wind power was the largest source of new electric generating capacity in the U.S. in 2012, with more than 13,000 MW of new wind capacity accounting for 42 percent of the U.S. total.<sup>15</sup> (Natural gas accounted for 33 percent of new capacity additions in 2012.)<sup>16</sup> Overall, U.S. wind capacity more than tripled between 2007 and 2012.<sup>17</sup> Policy uncertainty slowed the growth of wind energy substantially in 2013, but at year’s end the American Wind Energy Association (AWEA) reported a total U.S. wind capacity of about 61,100 MW, with projects totaling over 12,000 MW under construction.<sup>18</sup>



12 GTM Research and Solar Energy Industries Association (SEIA), “U.S. Solar Market Insight Report: 2013 Year-In-Review,” March 4, 2014, <http://www.seia.org/research-resources/solar-market-insight-report-2013-year-review>.

13 Ibid.

14 Ibid.

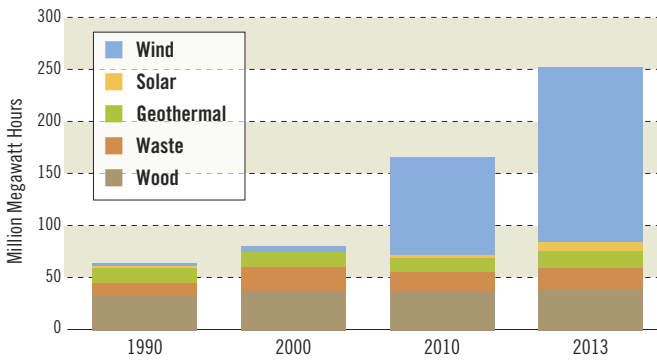
15 American Wind Energy Association (AWEA), “AWEA U.S. Wind Industry Annual Market Report, Year Ending 2012: Executive Summary,” January 30, 2013, [http://awea.files.cms-plus.com/images/AWEA\\_USWindIndustryAnnualMarketReport2012\\_ExecutiveSummary\(2\).pdf](http://awea.files.cms-plus.com/images/AWEA_USWindIndustryAnnualMarketReport2012_ExecutiveSummary(2).pdf).

16 U.S. Department of Energy, Office of Energy Projects, “Energy Infrastructure Update,” December 2012.

17 Union of Concerned Scientists (UCS), “Ramping Up Renewables,” April 2013, [http://www.ucsusa.org/assets/documents/clean\\_energy/Ramping-Up-Renewables-Energy-You-Can-Count-On.pdf](http://www.ucsusa.org/assets/documents/clean_energy/Ramping-Up-Renewables-Energy-You-Can-Count-On.pdf).

18 AWEA, “AWEA U.S. Wind Industry Fourth Quarter 2013 Market Report,” January 30, 2014, [http://awea.files.cms-plus.com/FileDownloads/pdfs/AWEA%204Q2013%20Wind%20Energy%20Industry%20Market%20Report\\_Public%20Version.pdf](http://awea.files.cms-plus.com/FileDownloads/pdfs/AWEA%204Q2013%20Wind%20Energy%20Industry%20Market%20Report_Public%20Version.pdf).

**Figure 3: Non-Hydropower Renewable Electricity Generation by Source—1990-2013**

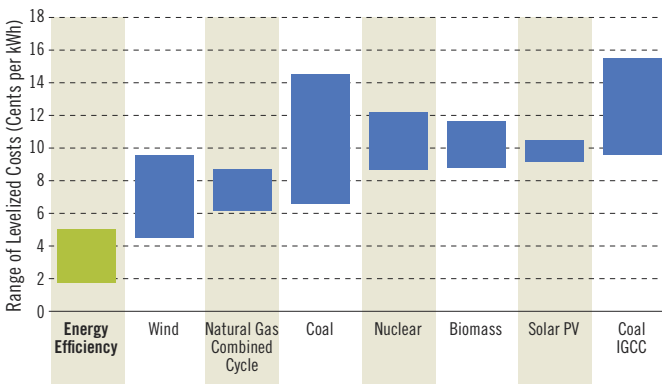


Source: U.S. Energy Information Administration

While growth in renewable electric generating capacity is a useful indicator of U.S. clean energy progress, it's the growth in the amount of actual renewable *generation*—that is, the number of kilowatt-hours of electricity produced by renewable resources and sold to customers—that's essential to reducing power sector greenhouse gas emissions. This figure has also grown in recent years, though not as fast as renewable capacity additions. According to the U.S. Energy Information Administration, non-hydro renewable electricity generation grew roughly four-fold from 1990 to 2013 (see **Figure 3**).<sup>19</sup>

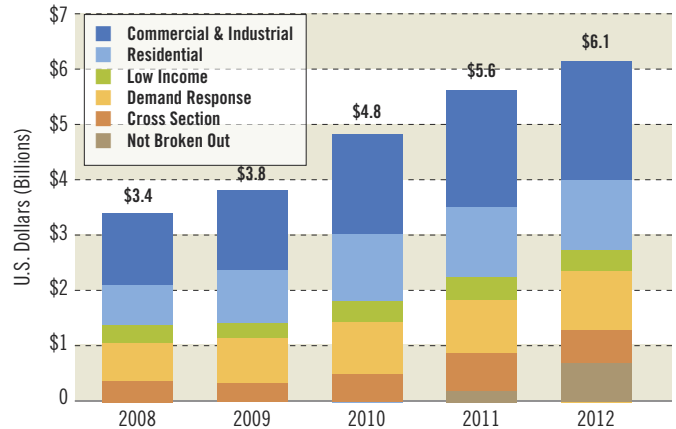
**Energy efficiency (EE)** is widely recognized as a viable and much cheaper alternative to building new central generating plants. Utilities and program administrators have found that it is far cheaper to reduce customers' demand for electricity—for example, by offering rebates

**Figure 4: Cost per Lifetime kWh of Various Electric Resources**



Source: ACEEE and Lazard

**Figure 5: U.S. Electric Demand-Side Management Expenditures—2008-2012**

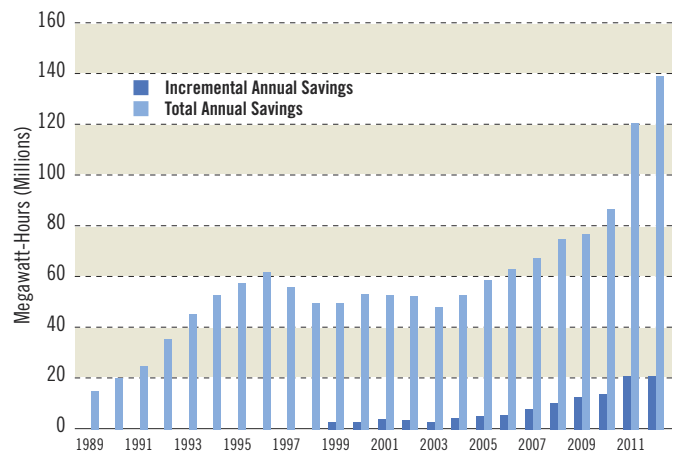


Source: Consortium for Energy Efficiency

for better insulation and more efficient windows and appliances—than to supply more electricity. The cost of saving energy is typically between two and five cents per kilowatt-hour (kWh)—often two or three times cheaper than other energy resources (see **Figure 4**).<sup>20</sup>

Investment in U.S. energy efficiency programs has grown dramatically in recent years. The Consortium on Energy Efficiency reports that total expenditures on electric efficiency and demand response programs by U.S. administrators totaled about \$6.1 billion in 2012 (see **Figure 5**).<sup>21</sup> Total savings from U.S. energy efficiency programs grew to nearly 140 million MWh in 2012, according to the American Council for an Energy-Efficient Economy (see **Figure 6**).<sup>22</sup>

**Figure 6: U.S. Energy Efficiency Savings—1989-2012**



Source: ACEEE

19 EIA, "Energy in Brief: How much U.S. electricity is generated from renewable energy?," updated April 14, 2014, [http://www.eia.gov/energy\\_in\\_brief/article/renewable\\_electricity.cfm](http://www.eia.gov/energy_in_brief/article/renewable_electricity.cfm).

20 American Council for an Energy-Efficient Economy (ACEEE), "The Future of the Utility Industry and the Role of Energy Efficiency," June 2014, <http://www.aceee.org/research-report/u1404>.

21 Consortium for Energy Efficiency, "2013 State of the Efficiency Program Industry," March 24, 2014, <http://library.cee1.org/content/2012-state-efficiency-program-industry-report/>.

22 ACEEE, "The Future of the Utility Industry and the Role of Energy Efficiency."

## State and National Policy as a Driver for Clean Energy Investment

State-level policy support has been essential to clean energy growth in the U.S. As of this writing, 29 states and the District of Columbia have enacted some form of **Renewable Portfolio Standard (RPS)** mandate (see **Figure 7**).<sup>23</sup> These policies require electric utilities and electricity marketers to include a specified percentage of renewable energy in their energy supply portfolios. Currently, 17 states have an RPS requiring at least 20 percent renewables by 2020, with Hawaii requiring 40 percent renewable energy by 2030.<sup>24</sup> Seven states have non-binding renewable energy goals.

Similarly, 22 U.S. states have enacted **Energy Efficiency Resource Standards (EERS)**, which require utilities and/or third-party program administrators to achieve a specified amount of energy savings. An EERS typically establishes a savings target of up to one or two percent of annual electricity sales.<sup>25</sup> Continued growth in utility energy efficiency spending has helped to produce flat-to-declining demand growth in many states, a trend that is expected to continue.

Nationally, the U.S. Environmental Protection Agency (EPA) views energy efficiency as a key compliance option for the agency's recently proposed **Clean Power Plan** requiring carbon emission reductions from the existing fleet of electric generating plants. In addition to achieving carbon reductions at the lowest overall cost, this may create an opportunity for better standardization and reporting of energy efficiency data across the U.S.

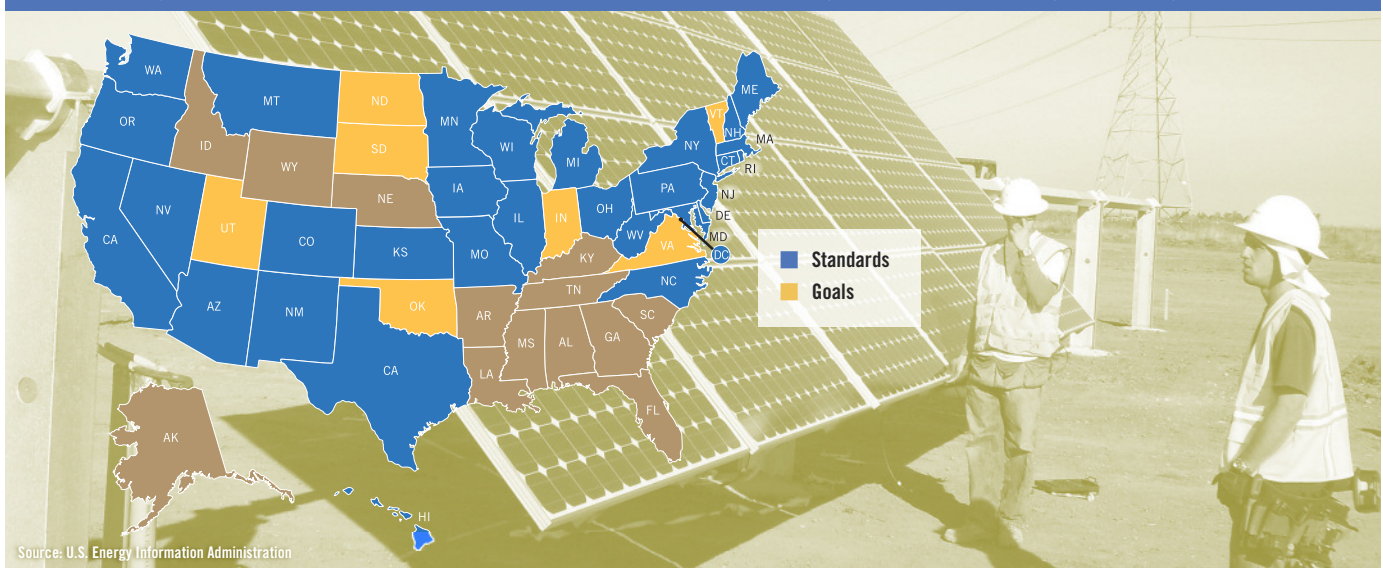
Under the Clean Power Plan, EPA will require states to develop emission reduction plans to achieve state-specific goals. The agency estimates that states can achieve annual incremental energy savings of 1.5 percent of total electricity consumption. Several utilities are already achieving energy savings that greatly exceed EPA's proposed target, as discussed later in this report.

## Disruptive Challenges Facing Electric Utilities

The increasing deployment of renewable energy and energy efficiency creates new challenges and dynamics for electric utilities. For decades, experts have pointed out that cheaper small-scale renewable energy options could prompt large customers to reject utility service altogether. Further, there are inherent tensions between centralized base load generation and variable and distributed resources, as well as between energy efficiency and a utility business model that relies on selling electricity to recoup significant capital investments.

These challenges are no longer abstract. In the U.S., low natural gas prices, near-zero electricity demand growth and strong renewable energy growth have suppressed wholesale power prices, cut into utility revenues and forced unanticipated closures of newly unprofitable base load coal and nuclear plants.

**Figure 7: States with Renewable Portfolio Standards (Mandatory) or Goals (Voluntary)—January 2012**



23 EIA, "Most states have Renewable Portfolio Standards," February 3, 2012, <http://www.eia.gov/todayinenergy/detail.cfm?id=4850>.

24 UCS, "Ramping up Renewables." Maine's RPS requires 40 percent renewable energy by 2017 but allows existing resources, mostly large-scale hydropower, to meet 75 percent of that standard.

25 ACEEE, "Energy Efficiency Resource Standards: State and Utility Strategies for Higher Energy Savings," June 15, 2011, <http://www.aceee.org/research-report/u113>.

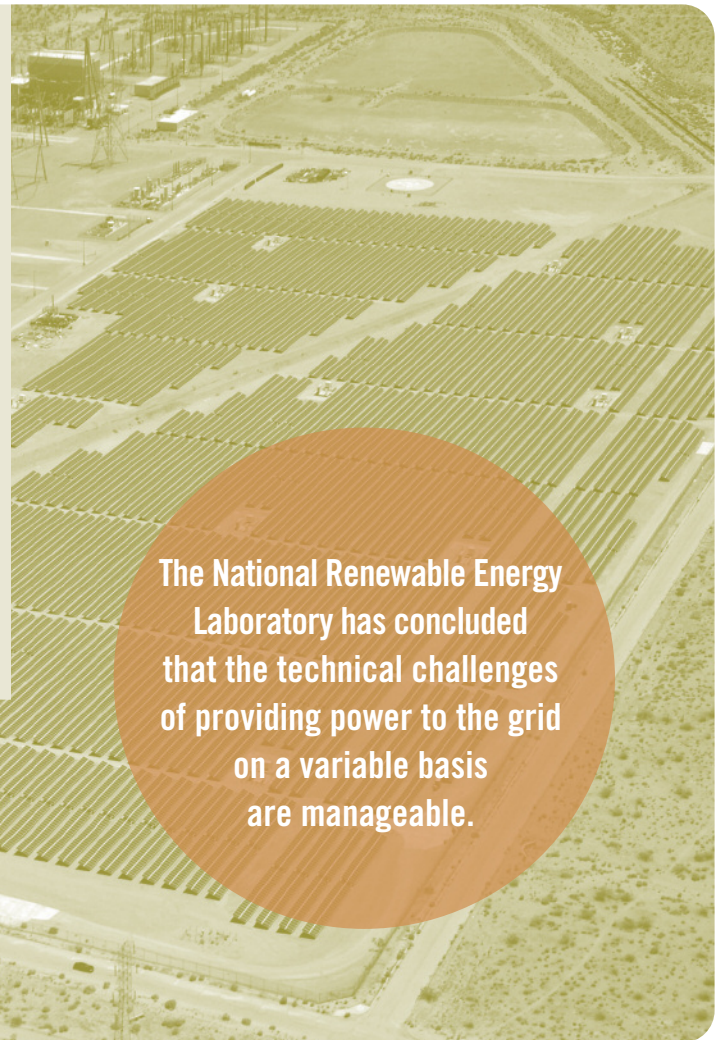
U.S. electric utilities are paying close attention. In a widely cited 2013 report, the Edison Electric Institute warned that an extreme scenario, in which large numbers of customers exit utility service, “raises the potential for irreparable damages to [utility] revenues and growth prospects.”<sup>26</sup> In some states, including California, Hawaii and New York, utility regulators are working proactively with utilities and stakeholders to develop new regulatory frameworks to address these challenges.

Pressure to find workable solutions will assuredly increase. Investment bank Morgan Stanley recently projected that the total addressable market for U.S. distributed solar PV

will grow to 241 GW over the next five years in a base case scenario, and could reach as high as 415 GW, or roughly equivalent to the electric generating capacity of 800 mid-sized coal-fired power plants.<sup>27</sup> If the base case proves out and actual installations reach even a quarter of the total addressable market, the amount of U.S. distributed solar PV capacity will increase roughly ten-fold in the next five years. In May 2014, Barclays issued an across-the-board credit rating downgrade of U.S. investor-owned electric utilities (IOUs), primarily due to the threat that solar PV plus energy storage could represent to utility earnings.<sup>28</sup>

## Accommodating Variable Renewable Power Generation

Some clean energy resources, such as solar and wind, provide power to the grid on a variable basis. Although this presents technical challenges to grid operators, who must closely match the quantity and quality of electric supply with electricity demand, a range of already-evident solutions in technology and grid management has led the National Renewable Energy Laboratory (NREL) to conclude that these challenges are manageable.<sup>29</sup> Approaches to integrating variable electricity generation include dispersing clean energy resources over a larger geographic area; better forecasting of wind and solar output; building quick-start natural gas plants to provide complementary generation when needed; upgrading transmission infrastructure; and better managing customer electricity demand.



The National Renewable Energy Laboratory has concluded that the technical challenges of providing power to the grid on a variable basis are manageable.

26 Edison Electric Institute (EEI), “Disruptive Challenges: Financial Implications and Strategic Responses to a Changing Retail Electric Business,” January 2013, <http://www.eei.org/ourissues/finance/documents/disruptivechallenges.pdf>.

27 Giles Parkinson, “Morgan Stanley: Tipping point nears for going off-grid,” *RenewEconomy*, March 24, 2014, <http://reneweconomy.com.au/2014/say-investors-wake-solar-pro-sumers-24413>.

28 Michael Aneiro, “Barclays Downgrades Electric Utility Bonds, Sees Viable Solar Competition,” *Barron's*, May 23, 2014, <http://blogs.barrons.com/incomeinvesting/2014/05/23/barclays-downgrades-electric-utility-bonds-sees-viable-solar-competition/>.

29 National Renewable Energy Laboratory (NREL), “Renewable Electricity Futures Study,” June 2012, [http://www.nrel.gov/analysis/re\\_futures/](http://www.nrel.gov/analysis/re_futures/).

# Benchmarking Utility Clean Energy Deployment

The U.S. electric power sector is the largest source of U.S. greenhouse gas emissions, responsible for roughly 40 percent of the country's global warming pollution. It is widely expected that U.S. electric utilities, through a mix of regulations and incentives, will be directed to mostly decarbonize their electricity supply portfolios in the coming decades.

This report provides a “moment in time” snapshot of how 32 of the largest U.S. investor-owned electric utilities are deploying renewable energy and energy efficiency on behalf of their customers. **Figure 8** lists the companies and their retail sales in 2012.<sup>30</sup> Wherever possible, this report utilizes data from 2012, the most recent year for which data is widely available.

**Figure 8: Selected U.S. Investor-Owned Electric Utility Holding Companies Ranked by 2012 Retail Electric Sales**

Holding Company	Rank	Retail Sales (MWh)	States
Duke Energy	1	205,843,041	FL, IN, KY, NC, OH, SC
Exelon	2	158,350,795	IL, MD, PA
Southern Co.	3	156,054,013	AL, FL, GA, MS
FirstEnergy	4	146,655,784	MD, NJ, OH, PA, WV
American Electric Power	5	137,865,319	AR, IN, KY, LA, MI, OH, OK, TN, TX, VA, WV
Entergy	6	107,006,909	AR, LA, MS, TX
Florida Power & Light	7	102,127,929	FL
Xcel Energy	8	89,197,694	CO, MI, MN, ND, NM, SD, TX, WI
Berkshire Hathaway Energy	9	86,991,113	CA, IA, ID, IL, OR, UT, WA, WY
PG&E	10	86,828,940	CA
Edison International	11	86,480,012	CA
Dominion Resources	12	76,718,050	NC, VA
Ameren	13	74,387,447	IL, MO
PPL Corp.	14	66,922,848	KY, PA, VA
ConEdison	15	62,609,086	NJ, NY, PA
National Grid	16	59,478,516	MA, NH, NY, RI
Northeast Utilities	17	55,519,803	CT, MA, NH
Pepco Holdings	18	48,145,834	DC, DE, MD, NJ
DTE Energy	19	47,990,734	MI
PSEG	20	41,641,444	NJ
CMS Energy	21	37,737,194	MI
Iberdrola	22	31,447,720	ME, NY
NV Energy	23	31,031,134	NV
Pinnacle West	24	28,154,136	AZ
AES	25	28,014,216	IN, OH
We Energies	26	27,043,204	MI, WI
OGE Energy	27	26,785,618	OK
Alliant Energy	28	25,732,527	IA, MN, WI
Puget Sound Energy	29	23,119,041	WA
SCANA	30	21,304,407	SC
Sempra Energy	31	20,025,695	CA
Portland General Electric	32	19,191,143	OR
<b>Total</b>		<b>2,216,401,346</b>	

Source: EIA Form 861 including both bundled and unbundled sales.

## Scope and Methodology

This report focuses solely on **investor-owned utilities** for several reasons. Data quality and availability for these companies, while in need of improvement and difficult to assemble, is generally superior to that of publicly owned utilities. Generally speaking, more investment in renewable energy and energy efficiency has occurred in the investor-owned segment of the U.S. utility industry, though there are prominent exceptions (e.g., Austin Energy, Sacramento Municipal Utility District, etc.). Finally, as a convener of institutional shareholders of U.S. electric utilities for more than two decades, Ceres has an established interest in the long-term financial, environmental and social performance of U.S. investor-owned utilities.

Benchmarking was done at the **parent holding company level**.<sup>31</sup> To do this, we aggregated data for all subsidiary companies into one overall metric for the parent company, and then compared the parent companies with each other. Because we focus on regulated retail distribution utilities with an obligation to serve the public, this report excludes activity by independent power producers (IPPs; e.g., NRG Energy) and by unregulated subsidiaries of utility holding companies (e.g. Con Edison Solutions, NextEra Energy Resources, etc.; for more discussion, see text box, “Independent Power Producers and U.S. Clean Energy Supply,” on page 16). Appendix B contains all available subsidiary company data.

### Three Clean Energy Indicators

1. Renewable Energy Sales
2. Cumulative Annual Energy Efficiency
3. Incremental Annual Energy Efficiency

This report compiles data for **three clean energy indicators**:

- 1 **Renewable energy sales:** The total amount of renewable electricity sold to retail customers.<sup>32</sup>
- 2 **Cumulative annual energy efficiency savings:** All energy savings from all energy efficiency programs active in a given year.
- 3 **Incremental annual energy efficiency savings:** All energy savings from i) new participants in existing programs and ii) all participants in new programs in a given year.<sup>33</sup>

To evaluate utilities in comparable terms, benchmarking was done using normalized data, with renewable energy sales and energy efficiency savings expressed as a percentage of annual retail sales. For completeness we also present absolute data, but did not rank utilities in absolute terms (since this would have greatly advantaged larger utilities).

This chapter provides data for each indicator separately. For a table with all three indicators, see Appendix A on page 25.

Smart meter deployment was also benchmarked because of its benefits for scaling up renewable energy. It was not considered central to the report’s analysis, however, and is included in Appendix C on page 29.

## Energy Storage: An Emerging Game-Changer for Renewable Energy

Low-cost energy storage would transform renewable energy’s potential to provide a consistently viable alternative to conventional fossil-fueled power. Because energy storage is not yet a significant resource for utilities, it was not included in this report. But over the last year, energy storage has taken significant steps forward. Navigant Consulting reports that, as of August 2013, no fewer than 115 energy storage systems existed across the U.S.<sup>34</sup> In October, Arizona utility APS (the regulated subsidiary of parent company Pinnacle West) announced that the Solana Generating Station had entered commercial operation. Solana is a solar thermal plant whose molten salt storage technology can produce electricity at full capacity for up to six hours after the sun goes down.<sup>35</sup> And the California Public Utilities Commission passed an unprecedented mandate in October 2013 requiring 1.3 GW of energy storage by 2020.

30 Retail sales data was calculated from EIA’s 2012 Annual Electric Power Industry Report, Survey Form EIA 861, available at <http://www.eia.gov/electricity/data/eia861/zip/f8612012.zip>. We excluded from this report two large electric utility holding companies, Energy Future Holdings and Reliant Energy, because little if any data about their clean energy performance could be found. Several mergers occurred in 2012 (e.g., Duke Energy/Progress Energy, Exelon/Constellation, Northeast Utilities/NSTAR); we’ve used the name of the surviving parent company.

31 FPL is an exception to this rule.

32 Whenever possible, we used data about utilities’ actual renewable energy sales to retail customers from sources such as utility 10-K reports, sustainability reports, and press releases. When this data was unavailable, we used the acquisition and/or retirement of renewable energy certificates (RECs) as a proxy for renewable energy sales, assigning one MWh of renewable energy sales for each REC acquired and/or retired.

33 Form EIA 861, Schedule 6, Part A refers to the energy savings from energy efficiency programs as “Actual Effects,” and utilities report data under the headings “Energy Efficiency Annual” and “Energy Efficiency Incremental”; see [http://www.eia.gov/survey/form/eia\\_861/instructions.pdf](http://www.eia.gov/survey/form/eia_861/instructions.pdf). We’ve simplified the nomenclature for this report.

34 Navigant Consulting, “Energy Storage Tracker 2013,” August 2013.

35 “Solana begins serving customers, providing power at night,” APS Press Release, October 9, 2013, <http://www.aps.com/en/ourcompany/news/latestnews/Pages/solana-begins-serving-customers-providing-power-at-night.aspx>.

The **renewable energy sales benchmarked** in this report include wind, solar PV (both utility-scale and distributed), solar thermal (concentrating solar power, or CSP), geothermal and biomass, because deployment of these resources is expected to increase significantly in the coming decades.<sup>36</sup> Utility-scale hydroelectric and nuclear power are important energy resources that contribute about a quarter of U.S. electricity generation; however, we do not include them in this report because nearly all of the country's large hydro and nuclear generation was built prior to 1980, and neither resource is widely expected to constitute a large portion of the nation's newly built carbon-free energy portfolio going forward.

## The Value of Benchmarking

Benchmarking clean energy deployment by U.S. utilities provides an opportunity for transparent reporting and analysis of important industry trends. It also fills a knowledge gap by offering utilities, regulators, investors, policy makers and other stakeholders consistent and comparable information on which to base their decisions.

- ▶ **The financial community**, including investors in the electric utility industry, are continually searching for new and better ways to evaluate the financial, environmental and social performance of electric utility companies. Investors are becoming increasingly attuned to how investor-owned electric utilities are adapting to disruptive challenges facing the sector and the extent to which utilities are modernizing their business models to enhance profitability and minimize risk of financial loss.
- ▶ **Electric utility companies** can benefit from clean energy benchmarking by understanding how their peers are performing, and specifically whether and how advanced technologies, wide-ranging state policies and innovative rate mechanisms are helping to create shareholder value, especially for companies in similar market and regulatory environments.
- ▶ **Consumers** can benefit from learning how much clean energy the utility has deployed, how the utility is tracking toward state renewable energy and energy efficiency requirements (if applicable), and how well-positioned the utility is for a lower-carbon future (which could impact reliability, service quality and customer bills).
- ▶ **Policymakers** can benefit from benchmarking by understanding which clean energy policies have been most effective in driving investment and creating value for customers, utilities, shareholders and non-utility businesses.

## The Role of U.S. Electric Utilities in Enabling a Clean Energy Future

While considerable differences exist among the investor-owned retail electric utility companies profiled in this report—in terms of size, geography, resource profiles and ownership of generation assets—they share three important characteristics: 1) oversight by regulatory utility commissions; 2) an obligation to serve the public (by providing “safe, reliable service at just and reasonable rates”); and 3) responsibility for investing in and maintaining the distribution grid.

These companies have an instrumental role to play in enabling the widespread deployment of clean energy, for several reasons. First, as the default providers of energy and energy services to tens of millions of U.S. homes and businesses, electric utilities will literally deliver our clean energy future. The renewable energy and energy efficiency metrics contained in this report are basic, fundamental indicators of utility progress toward this end. Second, by investing in the “smart grid”—including advanced metering infrastructure (AMI, or “smart meters”), as well as advanced substations and distribution equipment—these companies will transform the grid to accommodate the two-way flows of electricity resulting from distributed clean energy. Third, utilities often exert material influence in the policymaking process, and their advocacy can meaningfully accelerate or decelerate policy initiatives to advance clean energy. Finally, our clean energy future in the U.S. hinges on utilities' ability to adapt traditional business models beyond the decades-old method of recovering large investments in centralized resources through ever-increasing electricity sales.

Utilities making significant and increasing investments in clean energy resources and infrastructure are arguably better positioned for greater profitability as public policies to reduce carbon emissions take hold. The information and analysis in this report may thus be of high interest to utility investors who make daily decisions on where in the industry to invest, as well as to other parties who monitor utility performance in a range of areas.

<sup>36</sup> For consistency with state renewable energy standards, this report includes landfill gas and waste-to-energy in its definition of biomass energy. Future reports may revisit this definition.



## Independent Power Producers and U.S. Clean Energy Supply

Although this report focuses on retail electric utilities, Independent Power Producers (IPPs) are also a major developer and supplier of clean energy. This segment of the industry exists primarily to generate and sell electricity, and unlike retail electric utilities, IPPs have no assigned service territories. IPPs sell wholesale electricity to electric utilities and U.S. electricity markets, and sell retail electricity to non-utility customers via power purchase agreements (PPAs).

A number of holding companies that own and operate retail electric utilities also own and operate IPPs. These include ConEdison (ConEdison Solutions), NextEra Energy (NextEra Energy Resources), and Exelon (Exelon Generation).

NextEra Energy Resources, for example, is a wholesale electricity supplier and competitive power generator with a combined generating capacity of almost 19 gigawatts. According to NextEra, 95 percent of its facilities, including seven solar plants in California, generate power from renewable sources. NextEra also operates 9,000 wind turbines at more than 70 wind projects in 19 states and four Canadian provinces, for a total of more than 10,000 MW of wind capacity.

NextEra Energy Resources' activities are distinct from those of Florida Power and Light (FPL), NextEra's regulated utility subsidiary whose performance is benchmarked in this report.

## Caveats

Given the challenges associated with benchmarking utility clean energy deployment, a few caveats are in order:

- ▶ U.S. investor-owned electric utilities are a disparate, heterogeneous group, making direct apples-to-apples comparison among them difficult. For our purposes, one of the most relevant differences among electric utilities is the extent to which they retain control over resource selection. Utilities like National Grid and ConEdison, for example, have very limited say in resource choice due to the extent to which their local electricity markets have been “restructured,” with generation largely severed from distribution. In contrast, utilities like Southern Company and We Energies have far more control over their electric supply resource portfolios.
- ▶ Similarly, some states have taken responsibility for clean energy deployment away from electric utilities and created third-party administrators that oversee energy efficiency and/or renewable energy programs. This affects several utilities profiled in this report, including those operating in New York (ConEd, Iberdrola and National Grid), and Oregon (Portland General Electric). In this context, the utility collects funds from ratepayers and turns them over to the state's third-party administrator. In order not to penalize these utilities, we have attributed energy efficiency and/or renewable energy outcomes in these states in proportion to the funding that the utility provided or its share of in-state retail electricity sales.

While the utilities that rank highly in this report could be described as “leading the way to a clean energy future,” it is important not to consider a utility's benchmarking rank as a proxy for its industry leadership. Policy advocacy, arguably the most important leadership quality that utilities can exhibit on clean energy, is outside the scope of this report, for example.



## Indicator 1: Renewable Energy Sales

Renewable energy sales are the total amount of renewable electricity sold to retail customers, or the total amount of Renewable Energy Credits (RECs) acquired or retired by the utility.<sup>37</sup> This report focuses on the amount of renewable energy delivered from electric utilities to their customers, and does not cover independent power producers. Since states have different approaches to defining and tracking renewable energy, the renewable energy sales findings in this report are not intended to be a yardstick of a utility's compliance with its state renewable portfolio standards. Nevertheless, the renewable energy sales data provided in this report are a strong indicator of the utilities' clean energy deployment.

### Findings: Renewable Energy Sales:

- ▶ Leaders in this category are primarily located in regions with abundant renewable energy resources and/or with aggressive policy goals, such as NV Energy in Nevada, and Sempra, PG&E, and Edison International in California.
- ▶ There is significant variability in this list, with five companies providing nearly 54 percent of renewable energy sales and five delivering less than one percent.
- ▶ Utilities in the Southeast, such as Southern Company, SCANA, Entergy and Dominion Resources deliver very modest amounts of renewable energy to their customers due, in large part, to weaker state renewable energy and energy efficiency policies.

Five companies included in this report provide nearly 54 percent of renewable energy sales: Xcel Energy, PG&E, Edison International, Berkshire Hathaway Energy, Duke Energy.

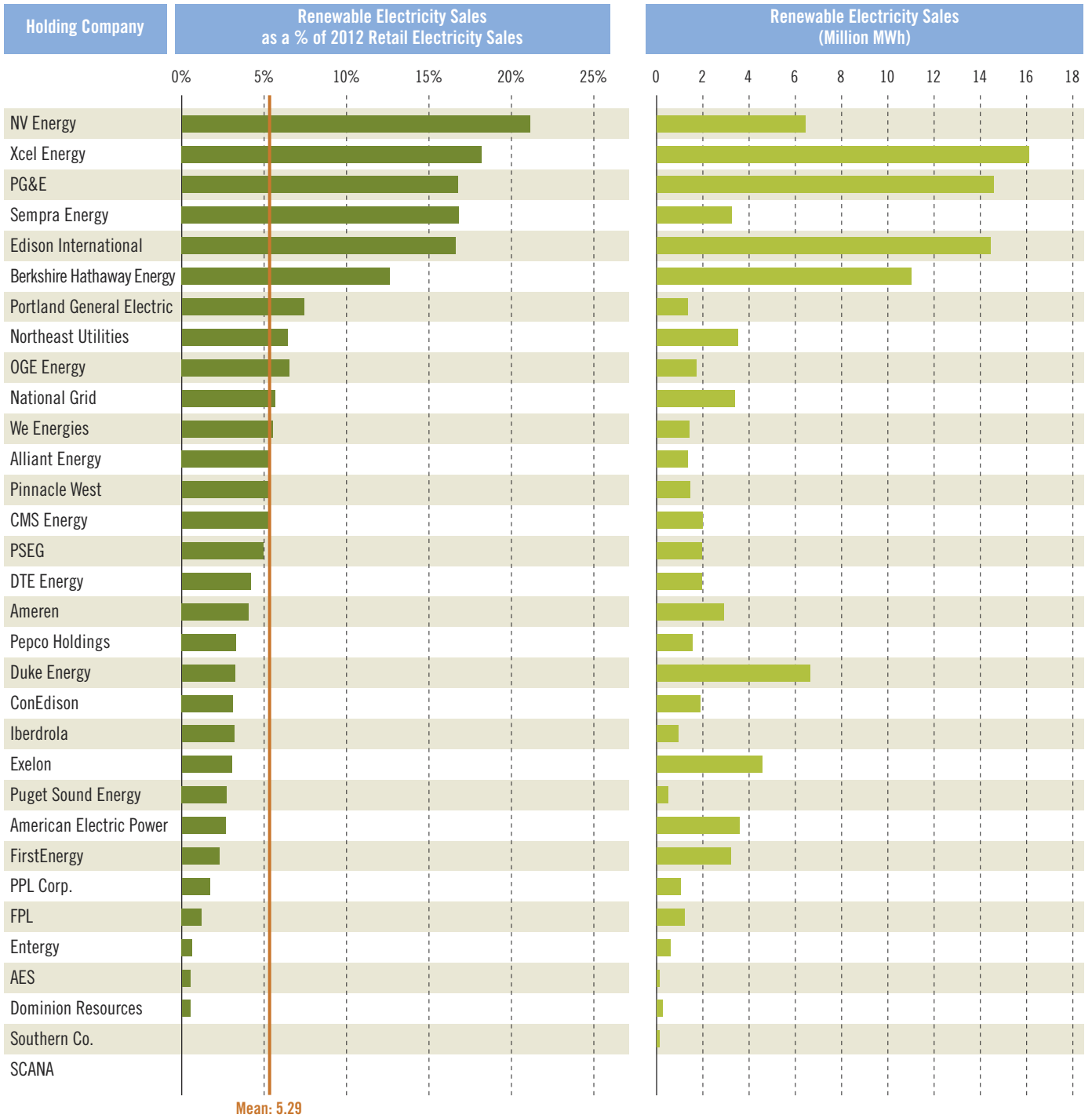
Indicator 1: Renewable Energy Sales			
Holding Company	Rank	Renewable Electricity Sales as a % of 2012 Retail Electric Sales	Renewable Electricity Sales (MWh)
NV Energy	1	21.08	6,542,884
Xcel Energy	2	18.11	16,157,006
PG&E	3	16.87	14,645,210
Sempra Energy	4	16.86	3,376,886
Edison International	5	16.67	14,415,200
Berkshire Hathaway Energy	6	12.71	11,058,570
Portland General Electric	7	7.52	1,444,000
Northeast Utilities	8	6.60	3,666,926
OGE Energy	9	6.59	1,764,000
National Grid	10	5.70	3,389,281
We Energies	11	5.67	1,532,000
Alliant Energy	12	5.41	1,391,000
Pinnacle West	13	5.35	1,507,021
CMS Energy	14	5.21	1,965,956
PSEG	15	4.93	2,051,413
DTE Energy	16	4.15	1,989,411
Ameren	17	4.03	2,994,802
Pepco Holdings	18	3.40	1,623,974
Duke Energy	19	3.29	6,775,395
ConEdison	20	3.19	1,997,219
Iberdrola	21	3.17	997,420
Exelon	22	2.97	4,700,000
Puget Sound Energy	23	2.75	635,958
American Electric Power	24	2.65	3,649,648
FirstEnergy	25	2.26	3,318,797
PPL Corp.	26	1.69	1,130,464
FPL	27	1.29	1,318,433
Entergy	28	0.64	682,574
AES	29	0.53	148,746
Dominion Resources	30	0.52	399,381
Southern Co.	31	0.05	71,135
SCANA	32	0.00	0
<b>Mean</b>		<b>5.29</b>	
<b>Median</b>		<b>4.09</b>	

Source: Ceres and Clean Edge, for data sources see Appendix B.

37 Again, the renewable energy sales benchmarked in this report include wind, solar PV (both utility-scale and distributed), solar thermal (concentrating solar power, or CSP), geothermal and biomass.

## Indicator 1: Renewable Energy Sales

Total renewable electricity sales reported for 2012 (MWh) and  
renewable electricity sales normalized as a percentage of total annual retail electricity sales



Source: Ceres and Clean Edge, for data sources see Appendix B.

## Indicator 2: Cumulative Annual Energy Efficiency Savings

Cumulative annual energy efficiency savings are energy savings from all energy efficiency programs active in a given year.<sup>38</sup> This measure includes savings from projects that were implemented in prior years and are still delivering energy savings in the current year (2012).

### Findings: Cumulative Annual Energy Efficiency Savings:

- ▶ Significant energy savings are achievable in states that make a sustained commitment to energy efficiency investment. California has prioritized energy efficiency for over three decades, and its three investor-owned utilities, with a combined savings of more than 32 million MWh for 2012, lead the way here.
- ▶ Some companies in the middle of the pack, such as Exelon, Duke Energy and AEP, have strong programs in some states but limited efforts in other states, dragging down their overall rankings.
- ▶ Vulnerabilities in state reporting requirements can allow utilities to claim credit for achievements that may not be theirs or may not yet have occurred. For example, at least one company reported here has taken public credit for energy savings by industrial customers when the utility was not involved in the efficiency projects.

Significant energy savings are achievable in states that make a sustained commitment to energy efficiency investment.

### Indicator 2: Cumulative Annual Energy Efficiency Savings

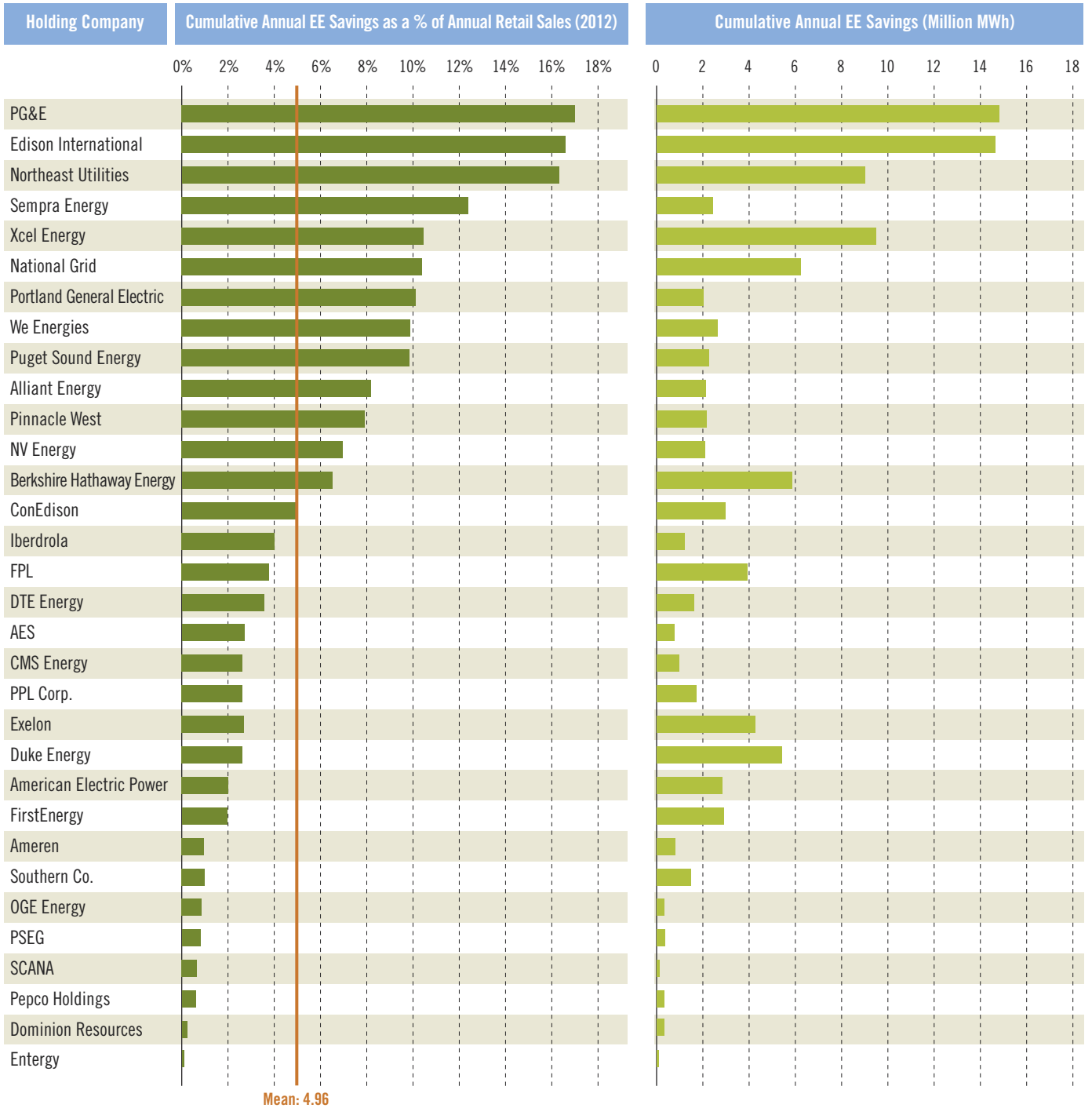
Holding Company	Rank	Cumulative Annual EE Savings as a % of 2012 Retail Electric Sales	Cumulative Annual EE Savings (MWh)
PG&E	1	17.18	14,917,724
Edison International	2	16.87	14,592,839
Northeast Utilities	3	16.46	9,138,285
Sempra Energy	4	12.54	2,511,666
Xcel Energy	5	10.62	9,475,396
National Grid	6	10.44	6,208,985
Portland General Electric	7	10.25	1,966,445
We Energies	8	10.14	2,740,916
Puget Sound Energy	9	9.93	2,296,525
Alliant Energy	10	8.39	2,158,612
Pinnacle West	11	7.98	2,246,313
NV Energy	12	7.01	2,176,672
Berkshire Hathaway Energy	13	6.74	5,860,259
ConEdison	14	5.10	3,190,269
Iberdrola	15	4.15	1,304,043
FPL	16	3.90	3,979,435
DTE Energy	17	3.62	1,735,632
AES	18	2.83	793,931
CMS Energy	19	2.79	1,051,697
PPL Corp.	20	2.77	1,856,925
Exelon	21	2.69	4,261,828
Duke Energy	22	2.68	5,516,970
American Electric Power	23	2.13	2,937,727
FirstEnergy	24	2.05	3,012,111
Ameren	25	1.10	819,352
Southern Co.	26	1.01	1,580,453
OGE Energy	27	0.96	256,427
PSEG	28	0.90	373,517
SCANA	29	0.84	178,958
Pepco Holdings	30	0.73	350,824
Dominion Resources	31	0.41	312,126
Entergy	32	0.13	141,323
<b>Mean</b>		<b>4.96</b>	
<b>Median</b>		<b>3.76</b>	

Source: Ceres and Clean Edge, for data sources see Appendix B.

<sup>38</sup> Data adjustments were made for two utility holding companies operating in Ohio. Energy efficiency data for the Ohio companies of FirstEnergy was adjusted to exclude the categories "Mercantile Customer" and "Transmission and Distribution," while data for AEP Ohio was adjusted to exclude the "Self Direct" category. These exclusions were made to allow useful comparisons of energy efficiency results among utilities.

## Indicator 2: Cumulative Annual Energy Efficiency Savings

All energy saved by all energy efficiency programs active in 2012 (MWh) and cumulative energy saved as a percentage of annual retail electricity sales



Source: Ceres and Clean Edge, for data sources see Appendix B.

## Indicator 3: Incremental Annual Energy Efficiency Savings

Incremental annual energy efficiency savings are all energy savings from 1) new participants in existing programs and 2) all participants in new programs in a given year.<sup>39</sup>

### Findings: Incremental Annual Energy Efficiency Savings:

- ▶ Pinnacle West achieved the highest saving rate on a per customer basis for 2012, despite the fact that Arizona only recently set ambitious energy savings goals for its utilities.
- ▶ California's utilities (PG&E, Sempra, and Edison International) all performed well, as did the Pacific Northwest's Portland General Electric and Puget Sound Energy.
- ▶ DTE Energy has also achieved significant savings in Michigan, where the future of the state's energy efficiency policy is being debated.

**Pinnacle West achieved the highest saving rate on a per customer basis for 2012, despite the fact that Arizona only recently set ambitious energy savings goals for its utilities.**

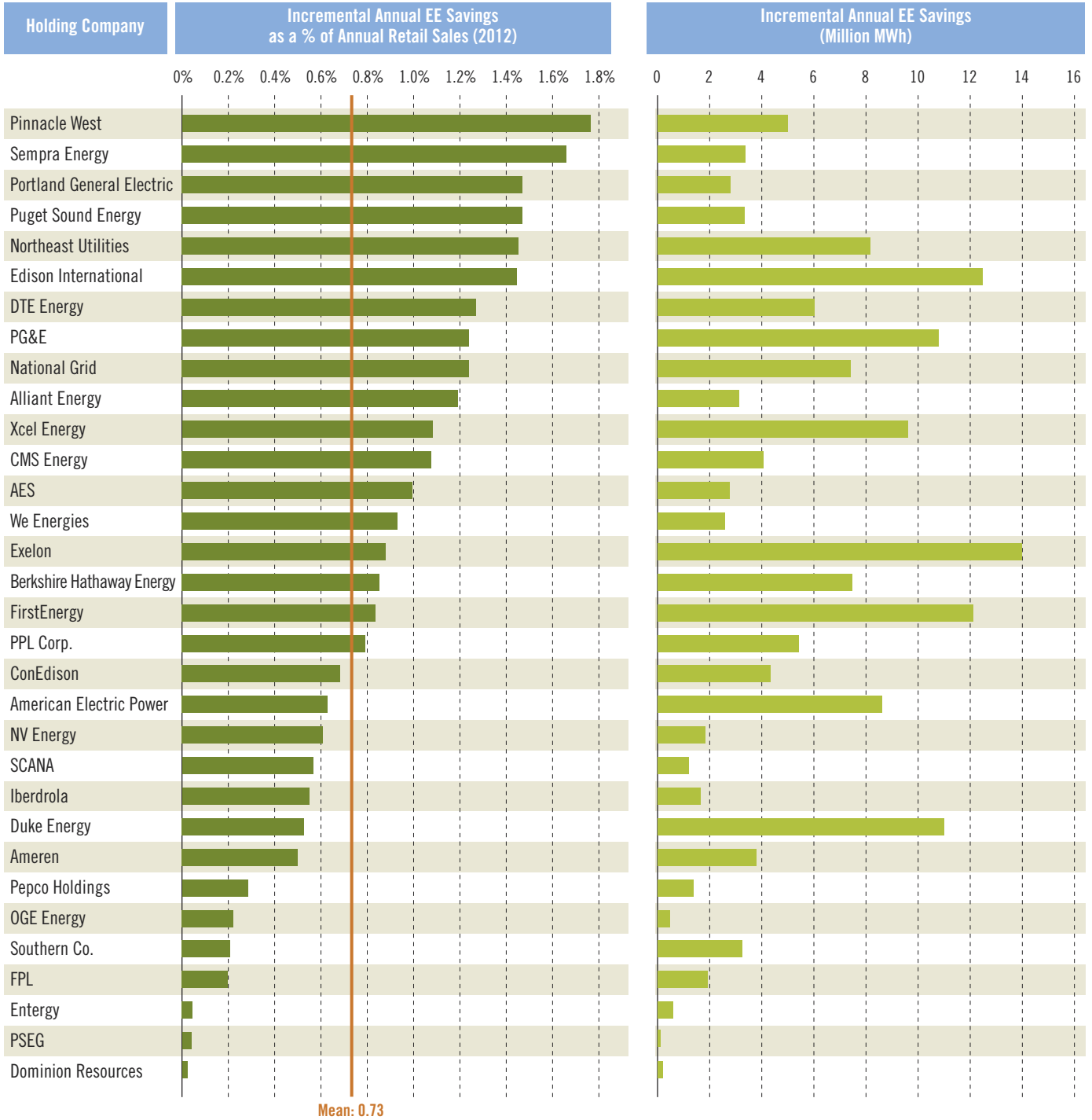
Indicator 3: Incremental Annual Energy Efficiency Savings			
Holding Company	Rank	Incremental Annual EE Savings as a % of 2012 Retail Electric Sales	Incremental Annual EE Savings (MWh)
Pinnacle West	1	1.77	499,239
Sempra Energy	2	1.67	335,413
Portland General Electric	3	1.47	282,335
Puget Sound Energy	4	1.47	339,490
Northeast Utilities	5	1.46	812,879
Edison International	6	1.45	1,249,681
DTE Energy	7	1.27	611,000
PG&E	8	1.25	1,082,225
National Grid	9	1.25	741,154
Alliant Energy	10	1.21	310,585
Xcel Energy	11	1.09	969,228
CMS Energy	12	1.09	409,948
AES	13	0.99	278,581
We Energies	14	0.95	255,605
Exelon	15	0.88	1,397,003
Berkshire Hathaway Energy	16	0.86	745,120
FirstEnergy	17	0.83	1,212,914
PPL Corp.	18	0.81	540,029
ConEdison	19	0.68	428,643
American Electric Power	20	0.63	863,230
NV Energy	21	0.61	188,598
SCANA	22	0.57	121,626
Iberdrola	23	0.55	172,825
Duke Energy	24	0.54	1,101,961
Ameren	25	0.51	380,037
Pepco Holdings	26	0.30	144,206
OGE Energy	27	0.21	57,433
Southern Co.	28	0.21	324,233
FPL	29	0.19	197,473
Entergy	30	0.06	59,996
PSEG	31	0.05	19,689
Dominion Resources	32	0.03	24,252
<b>Mean</b>		<b>0.73</b>	
<b>Median</b>		<b>0.84</b>	

Source: Ceres and Clean Edge, for data sources see Appendix B.

<sup>39</sup> As with Indicator 2, data adjustments were made for two utility holding companies operating in Ohio. Energy efficiency data for the Ohio companies of FirstEnergy was adjusted to exclude the categories "Mercantile Customer" and "Transmission and Distribution," while data for AEP Ohio was adjusted to exclude the "Self Direct" category. These exclusions were made to allow useful comparisons of energy efficiency results among utilities.

### Indicator 3: Incremental Annual Energy Efficiency Savings

Energy savings from new programs and new participants in existing programs in 2012 (MWh) and incremental energy saved as a percentage of annual retail electricity sales



Source: Ceres and Clean Edge, for data sources see Appendix B.

# Data Sources, Issues & Quality

## Renewable Energy Data

Gathering utility-specific data on renewable energy sales was the most challenging task in developing this report. Data sources were many and varied, and include the following:

- ▶ Renewable Portfolio Standard (RPS) annual reports
- ▶ IOU Securities and Exchange Commission (SEC) Form 10-K filings
- ▶ IOU press releases
- ▶ IOU websites
- ▶ Public utility commission (PUC) generation reserves studies
- ▶ Personal communications with IOU and PUC staff
- ▶ IOU integrated resource plans
- ▶ IOU Sustainability and Corporate Social Responsibility (CSR) reports
- ▶ IOU Carbon Disclosure Project (CDP) responses
- ▶ IOU public presentations
- ▶ IOU investor fact sheets
- ▶ Form EIA 861

As mentioned earlier, renewable energy data for New York utilities was calculated based on each utility's respective system benefit charge contribution to NYSERDA.

Every effort was made to source accurate data. But unlike energy efficiency data, which is relatively easier to find, data on renewable energy deployment and generation is not normally replicated among any of the reporting agencies; as a result, validating and fact-checking data is very difficult. In addition to possible errors in utility-reported data, there may be differences in how data is reported to different entities (e.g., EIA, public utility commissions, trade associations, etc.).

State RPS reports vary greatly in terms of information quality and quantity, and also timeliness. Some states have not issued RPS annual reports in several years, while others take several years beyond the compliance year to issue reports.

In some cases, RPS reports didn't agree with renewable energy sales that companies reported in their annual 10-K forms. When there was a discrepancy, data from the 10-K was used.

Data obtained directly from utilities were used over any other source. Some data requests to utilities went unfulfilled.

## Energy Efficiency Data

Nearly all energy efficiency data was drawn from 2012 EIA Form 861. For utilities operating in New York, Oregon and Wisconsin, energy efficiency results were attributed to each utility in proportion to its respective share of funding provided to the state's third-party energy efficiency administrator or its percentage of in-state retail electricity sales.

## Form EIA 861

Form EIA 861 collects data on the electric power industry and is published every October for the previous calendar year. We utilized Form EIA 861 to gather information on retail sales, energy efficiency, renewable and conventional generation, customer counts, AMI meter installations and net metering programs.

# Recommendations

**Energy efficiency and renewable energy, which have grown dramatically in the U.S., will become increasingly important resources for U.S. electric utilities going forward. Forming a complete and uniform picture of how utilities deploy these resources is critical. Following are specific recommendations on how federal and state agencies, utilities, regulators and other stakeholders can improve the quality and availability of utility clean energy data.**

- ▶ **Better, more up-to-date data is paramount.** Data from important sources such as EIA and state RPS reports are not only incomplete but are often dated.
- ▶ EIA, in its annual information request from electric utilities, should create **a new Form 861 file focused entirely on renewable energy** that is populated, at a minimum, by renewable energy sales and capacity data broken out by holding company and all subsidiaries; by renewable energy type (including distributed assets); and by ownership type (utility-owned, contracted, or customer-owned).
- ▶ As part of this new form, EIA should **clarify the definition of renewable energy** to include only sources such as wind, solar PV, solar thermal, geothermal, biomass, and small hydro (up to 30 MW), and explicitly exclude problematic energy sources that are considered renewable in some states (such as waste coal and “black liquor”), large hydro (greater than 30 MW) and fuel cells (unless powered by renewable fuels). These two improvements alone would greatly aid data collection and transparency.
- ▶ Additionally, EIA, FERC, or another federal agency should **begin tracking distributed and centralized grid intelligence infrastructure** such as energy storage and demand response, in addition to tracking smart meter deployment.
- ▶ **Federal guidance on state RPS and EERS reporting requirements** could ensure comparable, verifiable and timely data about utility clean energy deployment throughout the U.S.
- ▶ **The financial community**, including investors in the electric utility industry, should use this data to better evaluate the financial, environmental and social performance of electric utility companies. The data in this report should help investors identify how IOUs are adapting to disruptive challenges facing the sector and the extent to which utilities earn revenues from deploying clean energy.
- ▶ **Electric utility companies** should use this report to compare themselves to their peers, especially companies in similar market and regulatory environments, and to evaluate their positioning and strategies.
- ▶ **Policymakers** would benefit from determining which clean energy policies have been most effective in driving investment and creating value for customers, utilities, and the wider economy.
- ▶ **Consumers** can assess how much clean energy their utility has deployed, how the utility is progressing toward state renewable energy and energy efficiency requirements (if applicable), and how well positioned the utility is for a lower-carbon future.



# Holding Company Clean Energy Indicators

Holding Company	RE	EE	
	Renewable Energy Sales as a % of 2012 Retail Electric Sales (Indicator 1)	Cumulative Annual Energy Efficiency Savings as a % of 2012 Retail Electric Sales (Indicator 2)	Incremental Annual Energy Efficiency Savings as a % of 2012 Retail Electric Sales (Indicator 3)
AES	0.53	2.83	0.99
Alliant Energy	5.41	8.39	1.21
Ameren	4.03	1.10	0.51
American Electric Power	2.65	2.13	0.63
Berkshire Hathaway Energy	12.71	6.74	0.86
CMS Energy	5.21	2.79	1.09
ConEdison	3.19	5.10	0.68
Dominion Resources	0.52	0.41	0.03
DTE Energy	4.15	3.62	1.27
Duke Energy	3.29	2.68	0.54
Edison International	16.67	16.87	1.45
Entergy	0.64	0.13	0.06
Exelon	2.97	2.69	0.88
FirstEnergy	2.26	2.05	0.83
FPL	1.29	3.90	0.19
Iberdrola	3.17	4.15	0.55
National Grid	5.70	10.44	1.25
Northeast Utilities	6.60	16.46	1.46
NV Energy	21.08	7.01	0.61
OGE Energy	6.59	0.96	0.21
Pepco Holdings	3.40	0.73	0.30
PG&E	16.87	17.18	1.25
Pinnacle West	5.35	7.98	1.77
Portland General Electric	7.52	10.25	1.47
PPL	1.69	2.77	0.81
PSEG	4.93	0.90	0.05
Puget Sound Energy	2.75	9.93	1.47
SCANA	0.00	0.84	0.57
Sempra Energy	16.86	12.54	1.67
Southern	0.05	1.01	0.21
We Energies	5.67	10.14	0.95
Xcel Energy	18.11	10.62	1.09
<b>Mean</b>	<b>5.29</b>	<b>4.96</b>	<b>0.73</b>
<b>Median</b>	<b>4.09</b>	<b>3.76</b>	<b>0.84</b>

Source: Ceres and Clean Edge, for data sources see Appendix B.

# Subsidiary Company Data

The following table contains the most recent subsidiary company data that were available while the report was developed. Collectively, these 87 subsidiary companies, which operate under the 32 holding companies profiled in this report, accounted for about 68 percent of total 2012 U.S. retail electricity sales.

Holding Company	States	Subsidiary Company	Annual Retail Sales (MWh)	Total Customers	RE Sales (MWh)	Total Annual EE Savings (MWh)	Annual Incremental EE Savings (MWh)	RE Sales as % of Annual Retail Sales	Total Annual EE Savings as % of Annual Retail Sales	Annual Incremental EE Savings as % of Annual Retail Sales
AES	OH	Dayton Power & Light <sup>1,2</sup>	13,998,797	513,074	148,746	588,649	177,111	1.1	4.2	1.3
	IN	Indianapolis Power & Light <sup>2,3</sup>	14,015,419	470,961	0	205,282	101,470	0.0	1.5	0.7
		<b>Total</b>	<b>28,014,216</b>	<b>984,035</b>	<b>148,746</b>	<b>793,931</b>	<b>278,581</b>	<b>0.5</b>	<b>2.8</b>	<b>1.0</b>
Alliant Energy	IA, MN	Interstate Power and Light <sup>4,2</sup>	15,383,166	527,348	1,391,000	1,672,706	211,820	NA	10.9	1.4
	WI	Wisconsin Power and Light <sup>4,2</sup>	10,349,361	459,407	Included in IP&L	485,906	98,765	NA	4.7	1.0
		<b>Total</b>	<b>25,732,527</b>	<b>986,755</b>	<b>1,391,000</b>	<b>2,158,612</b>	<b>310,585</b>	<b>5.4</b>	<b>8.4</b>	<b>1.2</b>
Ameren	IL	Ameren Illinois Company <sup>5,2</sup>	37,641,539	1,213,560	2,634,908	791,519	352,204	7.0	2.1	0.9
	MO	Ameren Missouri Company (Union Electric) <sup>1,2</sup>	36,745,908	1,193,671	359,894	27,833	27,833	1.0	0.1	0.1
		<b>Total</b>	<b>74,387,447</b>	<b>2,407,231</b>	<b>2,994,802</b>	<b>819,352</b>	<b>380,037</b>	<b>4.0</b>	<b>1.1</b>	<b>0.5</b>
American Electric Power	TX	AEP Texas <sup>5,2</sup>		ND	1,409	711,114	55,087	0.0	0.0	0.0
	TN, VA, WV	Appalachian Power Co <sup>5,2</sup>	29,785,880	960,176	403,521	56,062	47,932	1.4	0.2	0.2
	IN, MI	Indiana Michigan Power <sup>1,2</sup>	18,403,788	583,362	70,023	241,138	101,012	0.4	1.3	0.5
	KY	Kentucky Power <sup>6,2</sup>	6,660,656	172,757	0	31,973	12,759	0.0	0.5	0.2
	OH	AEP Ohio <sup>1,7</sup>	46,904,916	1,460,393	372,822	1,446,620	535,000	0.8	3.1	1.1
	OK	Public Service Company of Oklahoma (PSO) <sup>3,2</sup>	17,963,562	534,948	2,639,918	188,925	74,773	14.7	1.1	0.4
	AR, LA, TX	Southwestern Electric Power Company (SWEPCO) <sup>8,2</sup>	18,146,517	521,601	161,955	261,895	36,667	0.0	0.0	0.0
		<b>Total</b>	<b>137,865,319</b>	<b>4,233,237</b>	<b>3,649,648</b>	<b>2,937,727</b>	<b>863,230</b>	<b>2.6</b>	<b>2.1</b>	<b>0.6</b>
Berkshire Hathaway Energy	IA, IL	MidAmerican Energy Co <sup>4,2</sup>	32,254,969	753,430	4,165,560	1,924,807	262,483	12.9	6.0	0.8
	CA, OR, WA, ID, UT, WY	Pacificorp <sup>4,2</sup>	54,736,144	1,753,691	6,893,010	3,935,452	482,637	12.6	7.2	0.9
		<b>Total</b>	<b>86,991,113</b>	<b>2,507,121</b>	<b>11,058,570</b>	<b>5,860,259</b>	<b>745,120</b>	<b>12.7</b>	<b>6.7</b>	<b>0.9</b>
CMS Energy	MI	Consumers Energy <sup>6,2</sup>	37,737,194	1,789,583	1,965,956	1,051,697	409,948	5.2	2.8	1.1
		<b>Total</b>	<b>37,737,194</b>	<b>1,789,583</b>	<b>1,965,956</b>	<b>1,051,697</b>	<b>409,948</b>	<b>5.2</b>	<b>2.8</b>	<b>1.1</b>
ConEdison	NY	Consolidated Edison Co- NY Inc <sup>6,1,7,2</sup>	56,878,555	3,344,672	1,777,471	2,886,816	394,008	3.1	5.1	0.7
	NY	Orange & Rockland Utilities <sup>6,1,7,2</sup>	4,015,691	225,280	209,191	291,974	34,465	5.2	7.3	0.9
	PA	Pike County Light & Power Company <sup>6,2</sup>	75,034	4,661	46	24	0	0.1	0.0	0.0
	NJ	Rockland Electric Co. <sup>6,2</sup>	1,639,806	72,545	10,511	11,455	170	0.6	0.7	0.0
		<b>Total</b>	<b>62,609,086</b>	<b>3,647,158</b>	<b>1,997,219</b>	<b>3,190,269</b>	<b>428,643</b>	<b>3.2</b>	<b>5.1</b>	<b>0.7</b>
Dominion Resources	NC	Dominion North Carolina Power <sup>1,2</sup>		ND	125,368	ND	ND	0.0	0.0	0.0
	VA	Dominion Virginia Power (Virginia Elec.) <sup>1,2</sup>	76,718,050	2,455,494	274,013	312,126	24,252	0.4	0.4	0.0
		<b>Total</b>	<b>76,718,050</b>	<b>2,455,494</b>	<b>399,381</b>	<b>312,126</b>	<b>24,252</b>	<b>0.5</b>	<b>0.4</b>	<b>0.0</b>
DTE Energy	MI	Detroit Edison Co (The DTE Electric Company) <sup>1,2</sup>	47,990,734	2,129,920	1,989,411	1,735,632	611,000	4.1	3.6	1.3
		<b>Total</b>	<b>47,990,734</b>	<b>2,129,920</b>	<b>1,989,411</b>	<b>1,735,632</b>	<b>611,000</b>	<b>4.1</b>	<b>3.6</b>	<b>1.3</b>
Duke Energy	NC, SC	Duke Energy Carolinas, LLC <sup>6,2</sup>	75,231,515	2,410,643	ND	1,447,835	386,753	0.0	1.9	0.5
	IN	Duke Energy Indiana Inc <sup>6,2</sup>	27,781,825	1,649,823	ND	971,373	197,117	0.0	3.5	0.7
	KY	Duke Energy Kentucky <sup>6,2</sup>	3,998,687	787,622	ND	99,623	25,460	0.0	2.5	0.6
	OH	Duke Energy Ohio <sup>6,2</sup>	19,929,527	136,377	ND	1,031,093	204,935	0.0	5.2	1.0
	NC, SC	Progress Energy-Carolinas Inc <sup>6,2</sup>	42,520,804	689,045	ND	529,676	178,090	0.0	1.2	0.4
	FL	Duke Energy Florida (formerly Progress Florida) <sup>6,2</sup>	36,380,683	1,456,809	ND	1,437,370	109,606	0.0	4.0	0.3
		<b>Total</b>	<b>205,843,041</b>	<b>7,130,319</b>	<b>6,775,395</b>	<b>5,516,970</b>	<b>1,101,961</b>	<b>3.3</b>	<b>2.7</b>	<b>0.5</b>

# Appendix B

Holding Company	States	Subsidiary Company	Annual Retail Sales (MWh)	Total Customers	RE Sales (MWh)	Total Annual EE Savings (MWh)	Annual Incremental EE Savings (MWh)	RE Sales as % of Annual Retail Sales	Total Annual EE Savings as % of Annual Retail Sales	Annual Incremental EE Savings as % of Annual Retail Sales
Edison International	CA	Southern California Edison Co <sup>9,2</sup>	86,480,012	4,941,078	14,415,200	14,592,839	1,249,681	16.7	16.9	1.4
		<b>Total</b>	<b>86,480,012</b>	<b>4,941,078</b>	<b>14,415,200</b>	<b>14,592,839</b>	<b>1,249,681</b>	<b>16.7</b>	<b>16.9</b>	<b>1.4</b>
Entergy	AR	Entergy Arkansas, Inc. <sup>6,2</sup>	21,086,870	697,194	0	107,627	26,300	0.0	0.5	0.1
	LA	Entergy Gulf States Louisiana, L.L.C. <sup>6,2</sup>	19,581,176	387,001	0	0	0	0.0	0.0	0.0
	LA	Entergy Louisiana Inc. <sup>6,2</sup>	31,710,224	673,831	0	0	0	0.0	0.0	0.0
	MS	Entergy Mississippi, Inc. <sup>6,2</sup>	13,272,532	439,875	0	0	0	0.0	0.0	0.0
	LA	Entergy New Orleans, Inc. <sup>6,2</sup>	5,011,659	163,777	0	0	0	0.0	0.0	0.0
	TX	Entergy Texas, Inc. <sup>6,2</sup>	16,344,448	416,343	682,574	33,696	33,696	4.2	0.2	0.2
		<b>Total</b>	<b>107,006,909</b>	<b>2,778,021</b>	<b>682,574</b>	<b>141,323</b>	<b>59,996</b>	<b>0.6</b>	<b>0.1</b>	<b>0.1</b>
Exelon	MD	BGE (Baltimore Gas & Electric Co) <sup>5,2</sup>	30,993,941	1,240,986	1,100,000	922,629	275,954	3.5	3.0	0.9
	IL	ComEd <sup>5,2</sup>	89,977,031	3,828,850	2,300,000	2,170,805	943,863	2.6	2.4	1.0
	PA	PECO Energy Co <sup>5,2</sup>	37,379,823	1,579,058	1,300,000	1,168,394	177,186	3.5	3.1	0.5
		<b>Total</b>	<b>158,350,795</b>	<b>6,648,894</b>	<b>4,700,000</b>	<b>4,261,828</b>	<b>1,397,003</b>	<b>3.0</b>	<b>2.7</b>	<b>0.9</b>
FirstEnergy	NJ	Jersey Central Power & Light <sup>1,2</sup>	20,812,497	1,100,165	1,111,125	398,837	2,175	5.3	1.9	0.0
	PA	Met-Ed (Metropolitan Edison Company) <sup>1,2</sup>	13,559,359	553,405	483,458	427,624	187,463	3.6	3.2	1.4
	WV	Mon Power (Monongahela Power) <sup>no data</sup>	10,500,271	386,908	ND	3,155	3,155	0.0	0.0	0.0
	OH	Ohio Edison Co <sup>1,2</sup>	24,440,821	1,031,761	372,822	408,110	160,077	1.5	1.7	0.7
	PA	Penelec (Pennsylvania Electric Company) <sup>1,2</sup>	13,864,963	589,505	501,874	417,768	147,316	3.6	3.0	1.1
	PA	Penn Power <sup>1,2</sup>	4,463,787	160,725	157,302	145,554	58,684	3.5	3.3	1.3
	MD, WV	Potomac Edison <sup>no data</sup>	10,154,032	389,184	ND	205,256	89,804	0.0	2.0	0.9
	OH	The Illuminating Co. (Cleveland Electric) <sup>1,2</sup>	18,804,605	745,327	(Comb. w/ OH Ed)	355,400	127,885	NA	1.9	0.7
	OH	Toledo Edison <sup>1,2</sup>	10,381,477	308,147	(Comb. w/ OH Ed)	124,072	49,610	NA	1.2	0.5
	PA	West Penn Power <sup>1,2</sup>	19,673,972	716,955	692,216	526,335	386,745	3.5	2.7	2.0
	<b>Total</b>	<b>146,655,784</b>	<b>5,982,082</b>	<b>3,318,797</b>	<b>3,012,111</b>	<b>1,212,914</b>	<b>2.3</b>	<b>2.1</b>	<b>0.8</b>	
FPL	FL	Florida Power & Light <sup>6,2</sup>	102,127,929	4,576,420	1,318,433	3,979,435	197,473	1.3	3.9	0.2
		<b>Total</b>	<b>102,127,929</b>	<b>4,576,420</b>	<b>1,318,433</b>	<b>3,979,435</b>	<b>197,473</b>	<b>1.3</b>	<b>3.9</b>	<b>0.2</b>
Iberdrola	ME	Central Maine Power <sup>10,2</sup>	8,933,712	609,380	0	1,415	137	0.0	0.0	0.0
	NY	New York State Electric & Gas <sup>1,7,2</sup>	15,282,857	879,534	672,745	878,947	116,819	4.4	5.8	0.8
	NY	Rochester Gas & Electric <sup>1,7,2</sup>	7,231,151	369,064	324,675	423,681	55,869	4.5	5.9	0.8
		<b>Total</b>	<b>31,447,720</b>	<b>1,857,978</b>	<b>997,420</b>	<b>1,304,043</b>	<b>172,825</b>	<b>3.2</b>	<b>4.1</b>	<b>0.5</b>
National Grid	NH	Granite State Electric <sup>1,2</sup>	911,468	42,414	33,057	74,225	5,643	3.6	8.1	0.6
	MA	Massachusetts Electric Company <sup>6,2</sup>	21,178,324	1,281,516	1,347,453	2,840,810	403,845	6.4	13.4	1.9
	MA	Nantucket Electric Company <sup>6,2</sup>	145,647	12,813	ND	ND	ND	0.0	0.0	0.0
	NY	Niagara Mohawk Power Co <sup>6,1,7,2</sup>	29,600,216	1,632,533	1,752,626	2,428,992	271,706	5.9	8.2	0.9
	RI	The Narragansett Electric Company <sup>6,2</sup>	7,642,861	488,744	256,145	864,958	59,960	3.4	11.3	0.8
	<b>Total</b>	<b>59,478,516</b>	<b>3,458,020</b>	<b>3,389,281</b>	<b>6,208,985</b>	<b>741,154</b>	<b>5.7</b>	<b>10.4</b>	<b>1.2</b>	
Northeast Utilities	CT	Connecticut Light & Power Co <sup>1,9</sup>	22,109,163	1,215,257	2,653,100	2,536,324	249,317	12.0	11.5	1.1
	MA	NSTAR Electric & Gas <sup>1,9</sup>	21,906,356	1,172,997	633,212	5,272,732	452,176	2.9	24.1	2.1
	NH	Public Service of New Hampshire <sup>1,9</sup>	7,820,831	500,048	255,591	509,950	34,632	3.3	6.5	0.4
	MA	Western Massachusetts Electric Company <sup>1,9</sup>	3,683,453	211,185	125,023	819,279	76,754	3.4	22.2	2.1
		<b>Total</b>	<b>55,519,803</b>	<b>3,099,487</b>	<b>3,666,926</b>	<b>9,138,285</b>	<b>812,879</b>	<b>6.6</b>	<b>16.5</b>	<b>1.5</b>
NV Energy	NV	Nevada Power Company <sup>1,2</sup>	21,862,528	849,374	4,225,710	1,647,652	147,366	19.3	7.5	0.7
	NV	Sierra Pacific Power <sup>1,2</sup>	9,168,606	324,454	2,317,174	529,020	41,232	25.3	5.8	0.4
		<b>Total</b>	<b>31,031,134</b>	<b>1,173,828</b>	<b>6,542,884</b>	<b>2,176,672</b>	<b>188,598</b>	<b>21.1</b>	<b>7.0</b>	<b>0.6</b>
OGE Energy	OK	Oklahoma Gas & Electric Co <sup>11,2</sup>	26,785,618	794,321	1,764,000	256,427	57,433	6.6	1.0	0.2
		<b>Total</b>	<b>26,785,618</b>	<b>794,321</b>	<b>1,764,000</b>	<b>256,427</b>	<b>57,433</b>	<b>6.6</b>	<b>1.0</b>	<b>0.2</b>

# Appendix B

Holding Company	States	Subsidiary Company	Annual Retail Sales (MWh)	Total Customers	RE Sales (MWh)	Total Annual EE Savings (MWh)	Annual Incremental EE Savings (MWh)	RE Sales as % of Annual Retail Sales	Total Annual EE Savings as % of Annual Retail Sales	Annual Incremental EE Savings as % of Annual Retail Sales
Pepco Holdings	NJ	Atlantic City Electric <sup>6,2</sup>	9,495,149	546,796	515,134	0	0	5.4	0.0	0.0
	DE, MD	Delmarva Power <sup>6,2</sup>	12,645,080	501,965	626,160	51,690	24,010	5.0	0.4	0.2
	DC, MD	Potomac Electric Power Company (PEPCO) <sup>6,2</sup>	26,005,605	791,715	482,680	299,134	120,196	1.9	1.2	0.5
		<b>Total</b>	<b>48,145,834</b>	<b>1,840,476</b>	<b>1,623,974</b>	<b>350,824</b>	<b>144,206</b>	<b>3.4</b>	<b>0.7</b>	<b>0.3</b>
PG&E	CA	Pacific Gas & Electric Co <sup>5,2</sup>	86,828,940	5,299,263	14,645,210	14,917,724	1,082,225	16.9	17.2	1.2
		<b>Total</b>	<b>86,828,940</b>	<b>5,299,263</b>	<b>14,645,210</b>	<b>14,917,724</b>	<b>1,082,225</b>	<b>16.9</b>	<b>17.2</b>	<b>1.2</b>
Pinnacle West	AZ	Arizona Public Service Co <sup>1,2</sup>	28,154,136	1,132,296	1,507,021	2,246,313	499,239	5.4	8.0	1.8
		<b>Total</b>	<b>28,154,136</b>	<b>1,132,296</b>	<b>1,507,021</b>	<b>2,246,313</b>	<b>499,239</b>	<b>5.4</b>	<b>8.0</b>	<b>1.8</b>
Portland General Electric	OR	Portland General Electric <sup>4,2</sup>	19,191,143	827,467	1,444,000	1,966,445	282,335	7.5	10.2	1.5
		<b>Total</b>	<b>19,191,143</b>	<b>827,467</b>	<b>1,444,000</b>	<b>1,966,445</b>	<b>282,335</b>	<b>7.5</b>	<b>10.2</b>	<b>1.5</b>
PPL	KY, VA	Kentucky Utilities <sup>9,2</sup>	19,069,476	538,461	3,224	211,699	57,433	0.0	1.1	0.3
	KY	Louisville Gas and Electric <sup>9,2</sup>	11,837,729	393,438	ND	267,467	64,472	0.0	2.3	0.5
	PA	PPL Electric Utilities Corp <sup>1,2</sup>	36,015,643	1,407,031	1,127,240	1,377,759	418,124	3.1	3.8	1.2
		<b>Total</b>	<b>66,922,848</b>	<b>2,338,930</b>	<b>1,130,464</b>	<b>1,856,925</b>	<b>540,029</b>	<b>1.7</b>	<b>2.8</b>	<b>0.8</b>
PSEG	NJ	Public Service Electric & Gas Co <sup>1,2</sup>	41,641,444	2,164,585	2,051,413	373,517	19,689	4.9	0.9	0.0
		<b>Total</b>	<b>41,641,444</b>	<b>2,164,585</b>	<b>2,051,413</b>	<b>373,517</b>	<b>19,689</b>	<b>4.9</b>	<b>0.9</b>	<b>0.0</b>
Puget Sound Energy	WA	Puget Sound Energy Inc. <sup>9,2</sup>	23,119,041	1,089,287	635,958	2,296,525	339,490	2.8	9.9	1.5
		<b>Total</b>	<b>23,119,041</b>	<b>1,089,287</b>	<b>635,958</b>	<b>2,296,525</b>	<b>339,490</b>	<b>2.8</b>	<b>9.9</b>	<b>1.5</b>
SCANA	SC	South Carolina Electric & Gas Company <sup>11,2</sup>	21,304,407	668,719	0	178,958	121,626	0.0	0.8	0.6
		<b>Total</b>	<b>21,304,407</b>	<b>668,719</b>	<b>0</b>	<b>178,958</b>	<b>121,626</b>	<b>0.0</b>	<b>0.8</b>	<b>0.6</b>
Sempra Energy	CA	San Diego Gas & Electric <sup>4,2</sup>	20,025,695	1,397,678	3,376,886	2,511,666	335,413	16.9	12.5	1.7
		<b>Total</b>	<b>20,025,695</b>	<b>1,397,678</b>	<b>3,376,886</b>	<b>2,511,666</b>	<b>335,413</b>	<b>16.9</b>	<b>12.5</b>	<b>1.7</b>
Southern	AL	Alabama Power Co <sup>6,2</sup>	53,946,766	1,440,488	ND	65,930	15,541	0.0	0.1	0.0
	GA	Georgia Power Co <sup>6,2</sup>	81,742,411	2,370,982	ND	758,543	225,099	0.0	0.9	0.3
	FL	Gulf Power <sup>6,2</sup>	10,662,634	434,570	ND	682,808	81,045	0.0	6.4	0.8
	MS	Mississippi Power <sup>6,2</sup>	9,702,202	186,146	ND	73,172	2,548	0.0	0.8	0.0
		<b>Total</b>	<b>156,054,013</b>	<b>4,432,186</b>	<b>71,135</b>	<b>1,580,453</b>	<b>324,233</b>	<b>0.0</b>	<b>1.0</b>	<b>0.2</b>
We Energies	MI, WI	Wisconsin Electric Power <sup>5,2</sup>	27,043,204	1,123,784	1,532,000	2,740,916	255,605	5.7	10.1	0.9
		<b>Total</b>	<b>27,043,204</b>	<b>1,123,784</b>	<b>1,532,000</b>	<b>2,740,916</b>	<b>255,605</b>	<b>5.7</b>	<b>10.1</b>	<b>0.9</b>
Xcel Energy	MN, ND, SD	Northern States Power Co (Minnesota) <sup>4,2</sup>	35,421,003	1,407,496	7,060,000	6,241,117	500,169	19.9	17.6	1.4
	MI, WI	Northern States Power Company (Wisconsin) <sup>4,2</sup>	6,458,381	250,794	ND	654,651	61,050	0.0	10.1	0.9
	CO	Public Service Co of Colorado <sup>4,2</sup>	28,786,033	1,380,646	6,713,674	2,174,356	357,475	23.3	7.6	1.2
	NM, TX	Southwestern Public Service Company <sup>4,2</sup>	18,532,277	378,397	2,383,332	405,272	50,534	12.9	2.2	0.3
		<b>Total</b>	<b>89,197,694</b>	<b>3,417,333</b>	<b>16,157,006</b>	<b>9,475,396</b>	<b>969,228</b>	<b>18.1</b>	<b>10.6</b>	<b>1.1</b>
	<b>TOTALS</b>	<b>2,216,401,346</b>	<b>89,312,986</b>	<b>117,340,710</b>	<b>109,944,185</b>	<b>16,156,631</b>				

**Data Sources:**

- 1 RPS Report
- 2 2013 EIA Form 861
- 3 IRP
- 4 10k
- 5 CSR Report
- 6 Company Official
- 7 Energy Efficiency Report to PUC
- 8 Company Press Release
- 9 Company Web Site
- 10 PUC Official
- 11 Company Fact Sheet

# Smart Meter Deployment

Because smart meters promise important benefits in scaling up renewable energy, we gathered data to see how utilities compared on smart meter installations. Although we elected not to factor smart meter deployment into the report's analysis, the information is offered here to interested readers. For illustrative purposes, we also show the number of smart meters installed as a percentage of retail customers. This data is from EIA Form 861, and includes electric meters only, not natural gas.

Utility Holding Companies Ranked by Smart Meter Deployment			
Holding Company	Rank	No. of Smart Meters Installed as % of 2012 Retail Customers	No. of Smart Meters Installed
OGE Energy Corp.	1	101.57	806,764
Portland General Electric	2	99.94	826,969
Sempra Energy	3	98.92	1,382,574
NextEra	4	94.77	4,337,132
NV Energy	5	85.11	998,989
PG&E Corporation	6	84.87	4,497,541
Edison International	7	77.78	3,843,372
Pinnacle West	8	70.00	792,589
PPL Corp	9	60.16	1,407,031
Southern Company	10	53.14	2,355,362
Pepco Holdings, Inc.	11	46.42	854,279
Alliant Energy	12	44.19	436,040
Iberdrola	13	33.20	616,805
DTE Energy	14	32.58	693,870
American Electric Power	15	20.19	854,698
Exelon/Constellation	16	8.60	572,109
Duke Energy/Progress Energy	17	7.62	543,528
Dominion Resources	18	4.51	110,688
CMS Energy	19	2.97	53,134
SCANA	20	1.41	9,398
AES Corporation	21	1.08	10,626
Entergy	22	0.63	17,445
Xcel Energy	23	0.61	20,998
FirstEnergy	24	0.48	28,892
Puget Sound Energy, Inc.	25	0.28	3,038
ConEdison	26	0.11	4,100
National Grid	27	0.10	3,598
Ameren	28	0.00	0
Berkshire Hathaway Energy	29	0.00	0
Northeast Utilities/NSTAR	30	0.00	0
PSEG	31	0.00	0
We Energies	32	0.00	0

Source: Ceres and Clean Edge, for data sources see Appendix B.

## Appendix C

The following provides smart meter deployment data for the 87 subsidiary companies included in this report:

Holding Company	Subsidiary Company	Total Customers	No. of Smart Meters Installed	No. of Smart Meters Installed as % of Retail Customers
AES Corporation	Dayton Power and Light	513,074	0	0.0
	Indianapolis Power & Light	470,961	10,626	2.3
	<b>Total</b>	<b>984,035</b>	<b>10,626</b>	<b>1.1</b>
Alliant Energy	Interstate Power and Light	527,348	0	0.0
	Wisconsin Power and Light	459,407	436,040	94.9
	<b>Total</b>	<b>986,755</b>	<b>436,040</b>	<b>44.2</b>
Ameren	Ameren Illinois Company	1,213,560	0	0.0
	Ameren Missouri Company (Union Electric)	1,193,671	0	0.0
	<b>Total</b>	<b>2,407,231</b>	<b>0</b>	<b>0.0</b>
American Electric Power	AEP Texas	ND	687,910	0.0
	Appalachian Power Co	960,176	0	0.0
	Indiana Michigan Power	583,362	9,358	1.6
	Kentucky Power	172,757	0	0.0
	AEP Ohio	1,460,393	128,306	8.8
	Public Service Company of Oklahoma (PSO)	534,948	29,124	5.4
	Southwestern Electric Power Company (SWEPCO)	521,601	0	0.0
	<b>Total</b>	<b>4,233,237</b>	<b>854,698</b>	<b>20.2</b>
Berkshire Hathaway Energy	MidAmerican Energy Co	753,430	0	0.0
	Pacificorp	1,753,691	0	0.0
	<b>Total</b>	<b>2,507,121</b>	<b>0</b>	<b>0.0</b>
CMS Energy	Consumers Energy	1,789,583	53,134	3.0
	<b>Total</b>	<b>1,789,583</b>	<b>53,134</b>	<b>3.0</b>
ConEdison	Consolidated Edison Co- NY Inc	3,344,672	4,100	0.1
	Orange & Rockland Utilities	225,280	0	0.0
	Pike County Light & Power Company	4,661	0	0.0
	Rockland Electric Co.	72,545	0	0.0
	<b>Total</b>	<b>3,647,158</b>	<b>4,100</b>	<b>0.1</b>
Dominion Resources	Dominion North Carolina Power	ND	ND	0.0
	Dominion Virginia Power (Virginia Elec. & Power Co.)	2,455,494	110,688	4.5
	<b>Total</b>	<b>2,455,494</b>	<b>110,688</b>	<b>4.5</b>
DTE Energy	Detroit Edison Co (The DTE Electric Company)	2,129,920	693,870	32.6
	<b>Total</b>	<b>2,129,920</b>	<b>693,870</b>	<b>32.6</b>
Duke Energy/Progress Energy	Duke Energy Carolinas, LLC	2,410,643	18,378	0.8
	Duke Energy Indiana Inc	1,649,823	11,265	0.7
	Duke Energy Kentucky	787,622	0	0.0
	Duke Energy Ohio	136,377	37,770	27.7
	Progress Energy-Carolinas Inc	689,045	476,115	69.1
	Duke Energy Florida (formerly Progress Energy-Florida Inc)	1,456,809	0	0.0
	<b>Total</b>	<b>7,130,319</b>	<b>543,528</b>	<b>7.6</b>

Source: Ceres and Clean Edge, for data sources see Appendix B.

## Appendix C

Holding Company	Subsidiary Company	Total Customers	No. of Smart Meters Installed	No. of Smart Meters Installed as % of Retail Customers
Edison International	Southern California Edison Co	4,941,078	3,843,372	77.8
	<b>Total</b>	<b>4,941,078</b>	<b>3,843,372</b>	<b>77.8</b>
Entergy	Entergy Arkansas, Inc.	697,194	1,032	0.1
	Entergy Gulf States Louisiana, L.L.C.	387,001	11,218	2.9
	Entergy Louisiana Inc	673,831	214	0.0
	Entergy Mississippi, Inc.	439,875	108	0.0
	Entergy New Orleans, Inc.	163,777	4,873	3.0
	Entergy Texas, Inc.	416,343	0	0.0
	<b>Total</b>	<b>2,778,021</b>	<b>17,445</b>	<b>0.6</b>
Exelon/Constellation	BGE (Baltimore Gas & Electric Co)	1,240,986	187,414	15.1
	ComEd	3,828,850	126,880	3.3
	PECO Energy Co	1,579,058	257,815	16.3
	<b>Total</b>	<b>6,648,894</b>	<b>572,109</b>	<b>8.6</b>
FirstEnergy	Jersey Central Power & Light	1,100,165	0	0.0
	Met-Ed (Metropolitan Edison Company)	553,405	0	0.0
	Mon Power (Monongahela Power)	386,908	0	0.0
	Ohio Edison Co	1,031,761	16	0.0
	Penelec (Pennsylvania Electric Company)	589,505	0	0.0
	Penn Power	160,725	0	0.0
	Potomac Edison	389,184	0	0.0
	The Illuminating Company (Cleveland Electric Illum Co)	745,327	5,188	0.7
	Toledo Edison	308,147	0	0.0
	West Penn Power	716,955	23,688	3.3
<b>Total</b>	<b>5,982,082</b>	<b>28,892</b>	<b>0.5</b>	
Iberdrola	Central Maine Power	609,380	616,805	101.2
	New York State Electric & Gas	879,534	0	0.0
	Rochester Gas & Electric	369,064	0	0.0
	<b>Total</b>	<b>1,857,978</b>	<b>616,805</b>	<b>33.2</b>
National Grid	Granite State Electric	42,414	6	0.0
	Massachusetts Electric Company	1,281,516	410	0.0
	Nantucket Electric Company	12,813	0	0.0
	Niagara Mohawk Power Co	1,632,533	2,971	0.2
	The Narragansett Electric Company	488,744	211	0.0
<b>Total</b>	<b>3,458,020</b>	<b>3,598</b>	<b>0.1</b>	
NextEra	Florida Power & Light	4,576,420	4,337,132	94.8
	<b>Total</b>	<b>4,576,420</b>	<b>4,337,132</b>	<b>94.8</b>
Northeast Utilities/NSTAR	Connecticut Light & Power Co	1,215,257	0	0.0
	NSTAR Electric & Gas	1,172,997	0	0.0
	Public Service of New Hampshire	500,048	0	0.0
	Western Massachusetts Electric Company	211,185	0	0.0
	<b>Total</b>	<b>3,099,487</b>	<b>0</b>	<b>0.0</b>

Source: Ceres and Clean Edge, for data sources see Appendix B.

## Appendix C

Holding Company	Subsidiary Company	Total Customers	No. of Smart Meters Installed	No. of Smart Meters Installed as % of Retail Customers
NV Energy	Nevada Power Company	849,374	809,485	95.3
	Sierra Pacific Power	324,454	189,504	58.4
	<b>Total</b>	<b>1,173,828</b>	<b>998,989</b>	<b>85.1</b>
OGE Energy Corp	Oklahoma Gas & Electric Co	794,321	806,764	101.6
	<b>Total</b>	<b>794,321</b>	<b>806,764</b>	<b>101.6</b>
Pepco Holdings, Inc.	Atlantic City Electric	546,796	0	0.0
	Delmarva Power	501,965	296,247	59.0
	Potomac Electric Power Company (PEPCO)	791,715	558,032	70.5
	<b>Total</b>	<b>1,840,476</b>	<b>854,279</b>	<b>46.4</b>
PG&E Corporation	Pacific Gas & Electric Co	5,299,263	4,497,541	84.9
	<b>Total</b>	<b>5,299,263</b>	<b>4,497,541</b>	<b>84.9</b>
Pinnacle West	Arizona Public Service Co	1,132,296	792,589	70.0
	<b>Total</b>	<b>1,132,296</b>	<b>792,589</b>	<b>70.0</b>
Portland General Electric	Portland General Electric	827,467	826,969	99.9
	<b>Total</b>	<b>827,467</b>	<b>826,969</b>	<b>99.9</b>
PPL Corp	Kentucky Utilities	538,461	0	0.0
	Louisville Gas and Electric	393,438	0	0.0
	PPL Electric Utilities Corp	1,407,031	1,407,031	100.0
	<b>Total</b>	<b>2,338,930</b>	<b>1,407,031</b>	<b>60.2</b>
PSEG	Public Service Electric & Gas Co	2,164,585	0	0.0
	<b>Total</b>	<b>2,164,585</b>	<b>0</b>	<b>0.0</b>
Puget Sound Energy, Inc.	Puget Sound Energy Inc	1,089,287	3,038	0.3
	<b>Total</b>	<b>1,089,287</b>	<b>3,038</b>	<b>0.3</b>
SCANA	South Carolina Electric & Gas Company	668,719	9,398	1.4
	<b>Total</b>	<b>668,719</b>	<b>9,398</b>	<b>1.4</b>
Sempra Energy	San Diego Gas & Electric	1,397,678	1,382,574	98.9
	<b>Total</b>	<b>1,397,678</b>	<b>1,382,574</b>	<b>98.9</b>
Southern Company	Alabama Power Co	1,440,488	162	0.0
	Georgia Power Co	2,370,982	2,355,105	99.3
	Gulf Power	434,570	76	0.0
	Mississippi Power	186,146	19	0.0
	<b>Total</b>	<b>4,432,186</b>	<b>2,355,362</b>	<b>53.1</b>
We Energies	Wisconsin Electric Power	1,123,784	0	0.0
	<b>Total</b>	<b>1,123,784</b>	<b>0</b>	<b>0.0</b>
Xcel Energy	Northern States Power Co (Minnesota)	1,407,496	0	0.0
	Northern States Power Company (Wisconsin)	250,794	0	0.0
	Public Service Co of Colorado	1,380,646	20,969	1.5
	Southwestern Public Service Company	378,397	29	0.0
	<b>Total</b>	<b>3,417,333</b>	<b>20,998</b>	<b>0.6</b>

Source: Ceres and Clean Edge, for data sources see Appendix B.





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