American Public Power Association

Power Plants Are Not Built on Spec

2014 Update

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Introduction and Summary of Findings

This paper analyzes new generation capacity that was completed and began operating in 2013, with a focus on the financial arrangements behind such resources. This same analysis was conducted two years ago for new capacity constructed in 2011.[1] Between these two reports, multiple events and developments have drawn increasing attention to the need to not only ensure resource adequacy overall, but to achieve the right balance of different types of capacity and in the optimal locations on the grid. Such developments include new environmental regulations, the significant outages and price spikes experienced during the 2014 winter, concerns about an increased reliance on natural gas, and the difficulties of integrating variable renewable resources.

Meanwhile, the debate continues over whether the capacity markets operated by the Regional Transmission Organizations (RTOs) are an effective means to provide a reliable supply of resources while addressing these goals, especially the mandatory capacity markets in ISO New England (ISO NE), the PJM Interconnection (PJM) and the New York ISO (NY ISO). Many observers of the electricity markets have stated simply that the capacity markets are broken.[2] A recent study by Christensen Associates Energy Consulting, commissioned by the Electric Markets Research Foundation, concluded that the RTO markets "do not and cannot address long-term capacity needs." The study also found that "[b]ilateral forward contracting remains key under any market design for locking in revenues and facilitating financing of new resources. Contrary to this key necessity, however, the RTO markets include some design elements that impede long-term investments and long-term bilateral contracts."[3]

The Federal Energy Regulatory Commission (FERC) and the RTOs appear to prefer to further tweak these markets rather than focus on new paradigms for resource development. Examples of such reworking of the market rules include PJM's issuance of a draft proposal for a new capacity product, ISO NE's recently approved performance incentives, and the NY ISO's creation of the Lower Hudson Valley capacity zone. All three have garnered significant opposition. APPA has instead long proposed that the mandatory capacity markets be phased out and replaced by residual, voluntary markets with bilateral contracting and ownership as the central means for resource procurement.

This paper contributes a much needed set of data in this ongoing reexamination of resource adequacy mechanisms—a real world analysis of the financial arrangements behind the construction of new capacity. Simply because a new generator is constructed within the geographic boundaries of an RTO with a capacity market is not an indicator that the market was the reason behind that new generation. Moreover, there are significant differences between RTOs with mandatory capacity markets and those that do not have such markets and whose utilities generally own or contract for resources to serve their load, including the Midcontinent ISO (MISO), the California ISO (CA ISO) and the Southwest Power Pool (SPP). (See Appendix A for a more detailed description of the capacity markets.)

As was found in the analysis of 2011 generation, almost all new capacity was constructed under a long-term contract or ownership. Just 2.4 percent of the new capacity was built for sale into a market, a number that includes new facilities for which no information could be found about the contracts. Moreover, when broken down geographically, only 6 percent of all capacity constructed in 2013 was built within the footprint of the RTOs with mandatory capacity markets.

[1] *Power Plants are Not Built on Spec,* American Public Power Association, March 2012, http://www.publicpower.org/files/PDFs/PowerPlantsArenotBuiltonSpecMarch2012_1331649529309_2.pdf

[2] For example, see the comments of Linda Stuntz and Elizabeth Moler at *Electricity in Transition: Technology, Markets and Regulation,* at the Center for Strategic and International Studies, September 4, 2014. http://csis.org/multimedia/video-electricity-transition-technology-markets-and-regulation

[3] *Ensuring Adequate Power Supplies for Tomorrow's Electricity Needs,* Christensen Associates Energy Consulting LLC, June 16, 2014, http://www.emrf.net/uploads/3/1/7/1/3171840/ensuring_adequate_power_supplies_for_emrf_final.pdf

Sources of Data

Data on new generation was obtained from three primary sources:

1. The Energy Infrastructure Update[4] issued each month by FERC. These reports provide monthly and cumulative data on new natural gas facilities (pipelines, storage and liquefied natural gas), hydropower (license filed or issued, and facility placed in service), electric generation capacity, and transmission projects. For each of these categories, FERC staff selects certain projects to highlight and provides brief project descriptions, which often provides information on the ownership or contracting arrangements.
2. U.S. Energy Information Administration (EIA)'s Table 6.3 (New Utility Scale Generating Units by Operating Company) for all months of 2013.[5] This table provides the unit name, type of producer, state, capacity, technology and month of completion. Information on the financial arrangements was generally obtained from the owner or purchaser's web site, local newspapers or other publications.
3. Data provided from the SNL Research.[6] This data does include information on contracts and ownership, which was verified through additional sources.

Each of these sources provided somewhat different information, including different months or years of completion or different capacity data, requiring verification through an additional source, such as the owner's web site or a local news article.

The findings are presented in summary form in the discussion and tables in the following section.[7] Appendix B contains a complete list of all projects examined for this analysis.

[4] *Energy Infrastructure Updates,* January—December 2013, Office of Energy Projects, Federal Energy Regulatory Commission, http://www.ferc.gov/legal/staff-reports.asp.

[5] Published in the *Electric Power Monthly,* US EIA, February 2014, http://www.eia.gov/electricity/monthly/current_year/february2014.pdf

[6] www.snl.com. Data are available to subscribers.

[7] For a more detailed analysis of the fuel mix of new and planned capacity, see "APPA Report on New Generating Capacity: 2014 Update," available at http://www.publicpower.org/files/PDFs/New_plants_analysis_2014.pdf

Analysis of New Generation Constructed in 2013

The capacity of the projects covered in this paper amounts to 14,738 megawatts (MW), which is 94 percent of the total 15,664 MW constructed in 2013, according to the FERC Infrastructure Report for December 2013.[8] FERC states that it derived this data from the Ventyx Global LLC, Velocity Suite. EIA reports a lower number of 13,890 MW.[9]

There were two predominant sources of funding for the new capacity, as summarized in Table 1. Two-thirds of the capacity was built with purchased power agreements (PPAs) for the sale of the power (64 percent of PPAs were with a utility and 2 percent with an end-use customer or non-utility retail supplier). Another 31.6 percent was constructed under ownership by the utility (29.6 percent) or customer (2 percent). Just 2.4 percent was built solely for sales into RTO markets (at most—plants for which no information was available were assumed to be built for market sales). The vast majority of the 2.4 percent of capacity built only for market sales received some type of external funding, such as grants from the American Reinvestment and Recovery Act (ARRA) or a state or foundation. As a result, just 0.1 percent of the new capacity was constructed for sale into the markets without any supplemental assistance.

As shown, natural gas and solar were the predominant technologies for new capacity. (Shaded areas indicate the largest percentages for a technology.) Natural gas builds were characterized by a smaller number of larger projects, primarily constructed under utility ownership, while the solar installations consisted of numerous smaller projects that are more likely to be subject to utility or individual customer PPAs.

Table 2 shows the same categories distributed by numbers of projects. In this case, the purchased power agreements and market sales accounted for slightly higher percentages of the number of projects (74 percent and 4 percent respectively), indicating that larger capacity projects tend to be built under utility ownership. Because of the numerous small-scale solar projects, this technology represented a much greater percentage of the number of projects than for the MW of capacity.

[8] http://www.ferc.gov/legal/staff-reports/2013/dec-energy-infrastructure.pdf

[9] These differences may be due to two factors; EIA does not include plants less than one MW and there could be variations in the assignment of plants built at the beginning or end of 2013 to either 2012 or 2014.

Table 1. Summary of Financial Arrangements for New Capacity in 2013 by Megawatts

	Purchased Power Agreements		Ownership		Market Sales	Total	
			Megawatts of Capacity				
Biomass/ Biogas	435.7	4.5%	187.4	4.0%	1.4	624.5	4.2%
Coal	925.0	9.5%	618.0	13.3%	0	1,543.0	10.5%
Fuel Cell	15.0	0.2%	13.8	0.3%	0	28.8	0.2%
Geo thermal	108.0	1.1%	0	0.0%	0	108.0	0.7%
Hydropower	120.1	1.2%	63.0	1.4%	131.8	314.9	2.1%
Landfill Gas	134.8	1.4%	13.4	0.3%	3.6	151.8	1.0%
Natural Gas	3,473.5	35.7%	3,468.6	74.5%	181.0	7,123.1	48.3%
Oil	0	0.0%	54.2	1.2%	0	54.2	0.4%
Solar	3,277.6	33.7%	209.4	4.5%	10.2	3,497.2	23.7%
Wind	1,243.0	12.8%	29.5	0.6%	0	1,272.5	8.6%
Flywheel	0	0.0%	0	0.0%	20.0	20.0	0.1%
Total	**9,732.7**	**100.0%**	**4,657.3**	**100.0%**	**348.0**	**14,738.0**	**100.0%**
% of Total	66%		31.6%		2.4%		

Table 2. Summary of Financial Arrangements for New Capacity in 2013 by Number

	Purchased Power Agreements		Ownership		Market Sales	Total	
			Number of Projects				
Biomass/ Biogas	22	9.4%	5	7.2%	1	28	8.8%
Coal	1	0.4%	1	1.4%	0	2	0.6%
Fuel Cell	1	0.4%	3	4.3%	0	4	1.3%
Geothermal	6	2.6%	0	0.0%	0	6	1.9%
Hydropower	5	2.1%	6	8.7%	3	14	4.4%
Landfill Gas	19	8.1%	4	5.8%	2	25	7.9%
Natural Gas	7	3.0%	17	24.6%	2	26	8.2%
Oil	0	0.0%	5	7.2%	0	5	1.6%
Solar	163	69.4%	26	37.7%	4	193	60.9%
Wind	11	4.7%	2	2.9%	0	13	4.1%
Flywheel	0	0.0%	0	0.0%	1	1	0.3%
Total	**235**	**100.0%**	**69**	**100.0%**	**13**	**317**	
% of Total	74.1%		21.8%		4.1%		

Table 3. New Capacity (MW) Constructed in 2013 within RTO Regions

	Purchased Power Agreement	Ownership	Market Sales	Total
MW in RTO Regions	8,068.8	1,989.6	348.0	**10,404.9**
Total MW	9,731.2	4,657.3	348.0	**14,738.0**
RTO MW % of Total	83%	43%	100%	**71%**
MW in RTOs without CA	2,145.5	1,317.5	348.0	**3,811.0**
Total MW without CA	3,809.3	3,985.2	348.0	**8,142.5**
RTO MW % of Total without CA	56%	33%	100%	**47%**
MW in Eastern RTOs	397.8	238.1	271.6	**905.45**
Eastern RTO MW % of Total	4%	5%	78%	**6%**

Table 3 analyzes the breakdown of the projects within RTO regions. These data are skewed by the preponderance of new capacity that was built in California, a single-state RTO, which are primarily solar resources subject to long-term contracts with the state's investor-owned utilities. Therefore, the numbers are presented with and without California. As shown, 71 percent of the new capacity was constructed within an RTO region, but when California is removed, the proportion drops to 47 percent within RTOs for the remaining states, although the RTOs contain about 60 percent of all electricity customers outside California. The new capacity built in the RTOs with mandatory capacity markets represents just 6 percent of the total, yet the states in PJM, ISO NE and the NY ISO contain a little over one-fourth of all customers. Moreover, about one-fourth of the projected coal-plant retirements over the next three years are projected to be in the PJM footprint.[10] ISO NE is also facing significant base load plant retirements.[11]

The final table shows the distribution of the new capacity supported by utility purchased power contracts and utility ownership by utility type. As shown, public power and cooperative utilities were responsible for 27 percent of the new MW built under utility contracts and ownership, about equal to their share of customers (27 percent) and sales of electricity (26 percent).[12] Public power and cooperative utilities had disproportionately greater shares of renewables other than solar, including biomass and biogas, geothermal and wind. Public power and cooperative's small share of solar (3.5 percent) in 2013 is likely due to the California investor-owned utilities' 70 percent share of the MWs of new solar contracts. In terms of solar watts per customer, public power accounted for three of the top ten and two of the top three utilities in 2013, according to the Solar Electric Power Association.[13]

Merchant Natural Gas Plants in PJM

The results of the last two capacity market auctions in PJM, held in May 2013 and 2014, appear to indicate a trend towards more merchant construction of new capacity for direct sale into the markets. But the extent to which the capacity that cleared these auctions will actually be built is uncertain at this time.

In the 2013 and 2014 Base Residual Auctions (BRAs), procuring capacity for the June 2016–May 2017 and June

[10] The Brattle Group projects that between 14 and 21 gigawatts of the projected 59 to 77 gigawatts of coal plant retirements will be in PJM by 2017. See "Coal Plant Retirements: Feedback Effects on Wholesale Electricity Prices," The Brattle Group, November 2013, http://www.brattle.com/system/publications/pdfs/000/004/966/original/Coal_Plant_Retirements_-_Feedback_Effects_on_Wholesale_Electricity_Prices.pdf?1386628227

[11] See for example, Prepared Statement for Gordon van Welie at the US Department of Energy Quadrennial Energy Review Meeting, April 21, 2014, http:www.iso-ne.com/staticassets/documents/pubs/pubcomm/pres_spchs/2014/van_welie_statement_4_21_14.pdf

[12] US Electric Utility Industry Statistics, American Public Power Association Directory and Statistical Report, http://www.publicpower.org/files/PDFs/USElectricUtilityIndustryStatistics.pdf

[13] http://www.solarelectricpower.org/discover-resources/solar-tools/utility-solar-rankings.aspx

Table 4. Distribution of New Capacity (MW) Under Utility Ownership or Contracts

	Investor-Owned Utility	Public Power	Rural Electric Cooperative	Public Power/ Co-op	Total[2]
Biomass/ Biogas	238.3	146.5	79.0	0	463.8
Coal	618.0	0	0	925.0	1,543.0
Fuel Cell	16.4	0	0	0	16.4
Geothermal	29.0	79.0	0	0	108.0
Hydropower	60.0	24.1	12.0	0	96.1
Landfill Gas	97.9	28.6	5.0	0	131.5
Natural Gas	5,590.5	714.1	371.0	183.0	6,858.6
Oil	46.0	8.2	0	0	54.2
Solar[1]	3,197.9	90.4	21.7	3.0	3,319.4
Wind	242.0	477.0	545.0	0	1,264.0
Total	**10,136.0**	**1,567.9**	**1,033.7**	**1,111.0**	**13,855.0**
Share of Total	**73.2%**	**11.3%**	**7.5%**	**8.0%**	**100%**

1 Solar total represents three solar projects developed by the Vermont Electric Power Producers, the purchasing agent for all utilities in the state, accounting for 6.4 MW.

2 The total in this table is equal to just the PPAs with and ownership by utilities. It excludes PPAs and ownership for other entities and the market sales.

2017–May 2018 delivery years, respectively, 3,481.1 and 4,230 MWs of generation cleared under the "competitive entry" exemption from the minimum offer price rule.[14] According to PJM, to obtain this exemption, "a merchant plant developer can attest that it is receiving no anomalous revenue streams or subsidies that were not otherwise available to all market participants from state agencies or state procurement processes that had not been deemed competitive and non-discriminatory." In other words, the plant cannot be receiving revenues from a long-term contract approved in a state proceeding, if such contract were only available to new plants or a specific technology, such as a combined cycle plant. For generation owned or contracted for by a utility, a specifically defined self-supply exemption is available. As a result, generation receiving the competitive entry exemption is built for direct sale into the PJM markets, and not under a contract or ownership.

Because PJM does not reveal the financial arrangements behind new generation, prior to the creation of the competitive entry exemption in the 2013 BRA, it was not clear whether new generation was purely merchant or built under a long-term contract or ownership. For example, in the 2012 BRA, almost 5,000 MW of new generation cleared the auction, but APPA research found that at least two-thirds of this generation was built under ownership or long-term contracts.[15]

The 7,700 MW of planned merchant generation that cleared the last two auctions in PJM appears to mark a dramatic change in the pattern reported in this study. Yet it is highly uncertain whether all of these plants will be constructed. PJM itself has acknowledged that only 20 percent of proposed new plants are actually built. For example, Tenaska's planned 930 MW combined-cycle facility in Westmoreland County, Pennsylvania has been delayed because the company is seeking thirty-year contracts for the output of the plant.[16] The consulting company, ICF

[14] More details on the minimum offer price rule are provided in Appendix A. Data are from the 2016/17 and 2017/18 RPM Base Residual Auction Reports, PJM Interconnection, http://www.pjm.com/markets-and-operations/rpm/rpm-auction-user-info.aspx

[15] PJM auction shows flaws in capacity market construct, critics say, Public Power Daily, June 4, 2012, http://www.publicpower.org/Media/daily/ArticleDetail.cfm?ItemNumber=35024

International, assumes in their internal forecasts that not all of the plants clearing the PJM capacity auctions will be built.[17] This lack of certainty is true for many planned generation projects—a 2013 APPA study found that the MW of cancellations between 2008 and 2012 (215,826 MW) is more than double the amount of capacity actually added over that same period.[18]

Moreover, much of the new natural gas generation clearing the past two auctions is financed by a combination of equity and Term Loan B financing, both of which require higher returns than traditional debt and are riskier investments.[19] Competitive Power Ventures, an independent power producer, estimates that a traditional debt financing with a 75/25 debt to equity ratio can cost over 20 percent less than a "merchant" project financing with a 50/50 debt to equity ratio.[20]

Conclusion

These data demonstrate the central flaw in the mandatory capacity markets—namely that the construction of new power plants necessitates stable long-term financial arrangements. As the electricity industry faces new challenges from environmental regulations, retiring baseload facilities, and difficulties stemming from an increased reliance on natural gas, it is crucial that the RTOs and FERC revisit the mandatory capacity markets paradigm. It is time to think outside the capacity markets box and support approaches to resource development that incorporate long-term planning, bilateral contracting, utility ownership, and demand-side approaches without the impediments posed by the complex "market" rules.

[16] "Construction of $500M power plant in South Huntingdon stalled," by Rich Cholodofsky, Pittsburgh Tribune-Review, July 27, 2014 http://triblive.com/state/pennsylvania/6328602-74/plant-power-plants#axzz38xY1Nr9Y. Ray Dotter, spokesman for PJM, is quoted in the article as stating that "Less than 20 percent of proposals actually get built, but the Tenaska proposal has a higher probability."

[17] "The Brutally Cold Truth about the Polar Vortex," ICF International, April 29, 2014, http://www.icfi.com/insights/webinars/2014/recording-polar-vortex-avoid-pitfalls.

[18] "APPA Report on New Generating Capacity: 2013 Update," January 2013, American Public Power Association, http://www.publicpower.org/files/PDFs/New_plants_analysis_2013.pdf

[19] See for example, "Announcement: Moody's: US power project loans becoming covenant-lite," May 8, 2013, https://www.moodys.com/research/Moodys-US-power-project-loans-becoming-covenant-lite--PR_272684.

[20] "Post-Technical Conference Comments Of CPV Power Development, Inc.," Centralized Capacity Markets in Regional Transmission Organizations and Independent System Operators, Docket AD13-7-000, Federal Energy Regulatory Commission, January 8, 2014, http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13434186

Appendix A

Capacity Markets Fact Sheet

What is a capacity market?

Capacity markets are complex constructs operated by entities known as regional transmission organizations (RTOs). RTOs are large bureaucratic, quasi-governmental entities that operate markets for capacity, electricity and other services, control transmission, dispatch generation and ensure the reliability of the grid within their region.

The capacity markets provide payments to owners of power plants who agree to stand ready to supply power when needed or to customers who agree to curtail power use when called upon (known as demand response). Capacity is the maximum amount of electricity that a power plant is designed to produce or that a customer is willing to curtail, stated in MWs (MW). An adequate supply of capacity at all times is necessary to ensure a reliable supply of power, and the intent of capacity payments is to cover power plants' fixed capital and other costs not recovered through electricity sales and other markets. Prior to the creation of capacity markets, many unregulated generation owners argued that the energy markets were not providing sufficient revenue for the construction of new resources and that an extra market was needed to provide this so-called "missing money." But the capacity markets instead provided excess revenue to a large segment of these unregulated generators.

The RTO-operated capacity markets in the mid-Atlantic, New England, and New York City are mandatory markets because all capacity must be bought and sold through these constructs. Because of the significant amount of revenue earned from these markets and the approval by the Federal Energy Regulatory Commission (FERC) of market rules that restrict new supply, owners of unregulated merchant generation have been advocating for similar mandatory capacity markets in other RTOs in the Midwest, California and Texas.

How do these markets work?

Each RTO establishes a reliability standard for all load-serving entities (such as public power utilities). This standard is the MW of capacity these entities must have in place through ownership, contracts or market purchases. The capacity markets hold periodic auctions where capacity is offered and purchased, typically once a year. These auctions produce a single price per MW that will be paid to all capacity resources, regardless of the type and cost. All customers within the RTO region pay the costs of these capacity payments, though there is no requirement that the generation owners actually use the revenue to build new power plants.

With a few exceptions, that capacity price will be in place for one year in a future time period, typically three years after the auction. RTOs also hold incremental auctions to allow for the procurement of additional capacity that may be needed in the near term.

Resources can only be counted toward the RTO reliability standard if they "clear" the auction for the applicable year, meaning that the resource submitted an offer below the clearing price. Until recently, capacity owned by a utility or subject to a long-term contract could offer to sell into the auction at a zero price to ensure such clearing. Because such resources are paid under another arrangement, they are indifferent to the capacity auction price and submit a zero offer as a "price taker."

Are the capacity markets the least-cost means to achieve reliability?

These constructs are costing consumers billions of dollars for little in return, for the following reasons:

Different resources have different costs.
In these markets, a 50-year old coal plant is paid the same amount per MW and for the same duration as is a brand new highly efficient combined-cycle natural gas plant as is an agreement by a factory to curtail load when needed. As a result, excess windfall revenue is paid to the older depreciated plants and the revenue stream is not stable enough to attract investors in new resources.

The bulk of revenue has been paid to existing plants. In the PJM Interconnection (primarily covering Maryland, New Jersey, Pennsylvania, Virginia, West Virginia, Ohio, northern Illinois, and Delaware), $72 billion has been paid or will be paid by consumers to generators and other capacity providers. Yet over 90 percent of this revenue has gone to existing generation, although many older plants have paid off much of their fixed costs. Moreover, most of the new generation capacity that has been built was done so under utility ownership and long-term contracts, not as a result of capacity market payments.

Capacity markets do not ensure an appropriate mix of resource types.
Because the capacity markets do not distinguish between technology types or specific locations on the grid, critical needs are not addressed, including adequate flexible ramping capability to match the variability of renewable resources, reliability gaps created by retiring coal plants, the coordination of natural gas infrastructure and delivery with the significant expansion of natural gas generation. As a result, the RTOs often create systems of side payments to ensure reliability, such as direct payments through what are known as reliability-must-run agreements to coal plants to remain in place to ensure reliability.

Price signals are not effective.
If transmission congestion limits the ability of capacity in one area to deliver lower cost power to another zone, the more congested zones may have a higher price. The theory behind zonal price differentials is that higher prices will act as a "signal" for the development of new generation or transmission. But such higher prices are not effective signals because owners of generation have no financial interest in building new resources and lowering prices for their existing units; investors seek steady and predictable revenue flows, not fluctuating prices; and many other factors influence the decision to build, including land and transmission availability, local acceptance, and environmental rules. Transmission construction may alleviate these price differentials, meaning that consumer paid both for higher prices and for the cost of the transmission.

Do capacity markets encourage new, cleaner generation?

As described, the capacity markets by design do not incent newer resources. A few years ago, several states located within RTOs became frustrated with the lack of new, more efficient generation given the billions of dollars spent on capacity payments, and sought to take control of their energy resource future and protect their residents from high electricity prices. New Jersey, Maryland and Connecticut all took steps to establish competitive bidding processes for the procurement of capacity for long-term bilateral contracts.

Fearful of the lower prices that would result from the entry of new generation resulting from these state efforts, owners of existing power plants sought to block this competition by obtaining approval from FERC for "minimum offer price rules" or "buyer-side" mitigation rules that impose a floor price on the offers from new resources, making it more difficult for these new plants to clear the auctions. (These rules apply just to natural gas units in PJM but to all resource types in New England.) A failure to clear means that the load-serving entities would pay twice for new capacity (once for the plant and a second time through the market). This risk makes investment in such new plants more difficult to obtain, which raises the cost of capital.

When capacity markets were created, the states, public power and cooperative utilities carefully negotiated exemptions from these minimum offer price rules for resources built by local utilities to supply their own load or for a state to address a reliability concern. But in response to the complaints from generators, FERC eliminated these negotiated and reasonable exemptions.

What is the alternative to the capacity markets?

APPA has proposed that FERC mandate a transition from mandatory capacity markets to voluntary residual markets, with the primary procurement of capacity conducted by states and local public power and cooperative utilities through bilateral contracts. This new paradigm would replace an irrational centrally-administered construct with the ability of states and local utilities to determine the optimal mix of resources, and to structure a portfolio of contracts for supply and demand-side resources of varying lengths and terms, or direct ownership that would lower costs to consumers, maximize reliability and provide environmental benefits.

Appendix B

List of 2013 New Capacity Projects

Ownership by Non-Utility Entity/PPA with a Utility

Name	MW	RTO	Purchaser	Type	Owner
Biogas/Biomass					
MGE Biodigester	1	MISO	Madison Gas & Electric	IOU	
Res AG DM 1-4	1.2	No	Four County Electric Membership Coop	Co-op	
Port of Tillamook	1.2	No	Tillamook Peoples Utility District	Public Power	Port of Tillamook
GL Dairy	1.4	MISO	Madison Gas & Electric	IOU	GL Dairy
Richland Center Farms, Schreiber Foods	1.7	MISO	WPPI	Public Power	Foremost
Stolze Biomass Lumber Co.	2.5	No	Flathead Electric Cooperative	Co-op	Stolze Land &
Stoltze CoGen and Lumber	2.5	No	Flathead Electric Co-op	Co-op	Stoltze Land
Rock Creek Dairy	3.2	No	Idaho Power	IOU	New Energy Co.
GreenWhey Energy	3.2	MISO	Xcel	IOU	GreenWhey
Eagle Valley Clean Energy	11.3	No	Holy Cross Energy	Co-op	Eagle Valley
Gypsum Biomass LLC	12.5	No	Holy Cross Energy	Co-op	Western Evce
Pinelands Biomass Project	35.6	No	Santee Cooper	Public Power	EDF Renewables
Plainfield Renewable	43	ISO NE	Connecticut Light & Power	IOU	Plainfield Renewable Energy Group
Rothschild Biomass	50	MISO	Wisconsin Energy	IOU	Weyerhauser
Piedmont Green	53.5	No	Georgia Power	IOU	Rollcast, Inc.
Burgess Biopower Capital	75	ISO NE	Public Service of New Hampshire	IOU	Café Street
Gainesville Renewable Energy	100	No	Gainesville Regional Utilities	Public Power	Starwood Capital
Coal					
Sandy Creek	925	ERCOT	Brazos Electric Power Coop., Lower Colorado River Authority, Brazos, Sandy Creek Electric Coop. Inc	Co-op/ Public Power	LS Power
Fuel Cell					
Bridgeport Fuel Cell Park	15	ISO NE	Connecticut Light & Power	IOU	Dominion

Ownership by Non-Utility Entity/PPA with a Utility

Name	MW	RTO	Purchaser	Type	Owner
Geothermal					
Lighting Dock	4	No	Public Service of New Mexico	IOU	Cyrq Energy
Thermo 1 Updgrade BE-01, LLC	8	CA ISO	Anaheim Utilities	Public Power	Thermo No. 1
Don Campbell	16	CA ISO	Burbank W&P and Los Angeles DWP	Public Power	Ormat Technologies
Fort Cove	25	No	Rocky Mountain Power	IOU	Enel Green Power
Cove Fort	25	No	Salt River Project	Public Power	Enel Green Power
Patua	30	CA ISO	Sacramento Municipal Utility District	Public Power	Gradient Resources
Hydropower					
Fargo Drop No. 1 Utility District	1.1	No	Idaho Power	IOU	Boise Project Board of Control
Boulder Canyon	5	No	Tri-State	Co-op	City of Boulder
Rainbow Hydroelectric	27	No	Northwestern	IOU	PPL Montana
Landfill Gas					
Ameresco	1.4	CA ISO	Palo Alto	Public Power	Ameresco Johnson LLC
Johnston County Landfill	1.6	No	Duke Energy Progress, Inc.	IOU	C2i Methane
BiCounty	1.9	No	Tennessee Valley Authority	Public Power	Enerdyne
Onslow Landfill Producers	2	No	Duke Energy Carolinas	IOU	Onslow Power
Otay Partners	3	CA ISO	San Diego Gas & Electric	IOU	Energy Power
Charlotte Motor	3.2	No	Duke Energy Carolinas	IOU	Foristar
Orchard Hill Generating Station	3.2	MISO	Michigan Public Power Agency	Public Power	Granger Energy Services
Tulsa LFGTE	3.2	SPP	OMPA	Public Power	Montauk Energy Holdings
Mahoning LFG	4	PJM	AMP	Public Power	Waste Management Inc.
Geneva Landfill	4	PJM	AMP/Oberlin	Public Power	Waste Management Inc.
Brookhaven Yaphank Landfill	4.5	NY ISO	Long Island Power Authority	Public Power	Wehran Energy Corp
Prince William County Landfill	5	PJM	Northern Virginia Elect Coop	Co-op	Foristar

Ownership by Non-Utility Entity/PPA with a Utility

Name	MW	RTO	Purchaser	Type	Owner
IESI Blue Ridge Landfill	6.4	PJM	Borough of Chambersburg	Public Power	PPL Renewable Energy
Surry Landfill	16	No	Duke Energy Carolinas	IOU	Barnabas Investment
Johnston CC Plant LFG Genco, LLC	32	ISO NE	Narraganset Electric	IOU	Rhode Island
Broadrock Biopower I	37	ISO NE	National Grid	IOU	Broadrock Renewables
Natural Gas					
Delano Plant	48	CA ISO	Southern California Edison	IOU	Delano Energy
Los Esteros Expansion	140	CA ISO	Pacific Gas & Electric	IOU	Calpine
Walnut Creek	500.5	CA ISO	Southern California Edison	IOU	Edison International
El Segundo	537	CA ISO	Southern California Edison	IOU	NRG
Russell City	620	CA ISO	Pacific Gas & Electric	IOU	Calpine
Sentinel Energy Expansion	800	CA ISO	Southern California Edison	IOU	CPV
Marsh Landing	828	CA ISO	Pacific Gas & Electric	IOU	NRG
Solar					
Genesis	125	CA ISO	Pacific Gas & Electric	IOU	NextEra
Ivanpah 2	133	CA ISO	Southern California Edison	IOU	NRG, Brightsource, Google
Ivanpah 1 and 3	258	CA ISO	Pacific Gas & Electric	IOU	NRG, Brightsource, Google
Solana Generating	280	No	Arizona Public Service	IOU	Abengoa SA
Solar PV Projects 10, 15, 23	7.5	CA ISO	Southern California Edison	IOU	
Watts 3115	1.5	CA ISO	Southern California Edison	IOU	
SEFL Fletcher Solar	1		Duke Energy Carolinas		
Rockmart	1	No	Georgia Power	IOU	Washington Gas
Cedartown	1	No	Georgia Power	IOU	Washington Gas
Merrell Brothers	1	MISO	Indianapolis Power & Light	IOU	Merrell Brothers
Methuen Source	1	ISO NE	National Grid	IOU	Ultimate Energy
Champagne NewEnergy	1	CA ISO	Southern California Edison	IOU	Constellation
Sunlight Partners	1	CA ISO	Southern California Edison	IOU	Capital Dynamic
Natural Science Center	1.3	No	Duke Energy Carolinas	IOU	Natural Science Center

Ownership by Non-Utility Entity/PPA with a Utility

Name	MW	RTO	Purchaser	Type	Owner
Onslow Producers	1.5	No	Duke Energy Carolinas	IOU	Onslow Power
Merrimac Solar Edison	1.5	ISO NE	Merrimac Municipal Light Dept	Public Power	Consolidated
Jurupa NewEnergy	1.5	CA ISO	Southern California Edison	IOU	Constellation
Industry	1.5	CA ISO	Southern California Edison	IOU	spower
Navajo	1.5	CA ISO	Southern California Edison	IOU	spower
Otoe	1.5	CA ISO	Southern California Edison	IOU	spower
Powhatan	1.5	CA ISO	Southern California Edison	IOU	spower
Innovative Solar 1 & 2	1.6	No	Duke Energy Carolinas	IOU	
Oakley Solar	1.68	CA ISO	Pacific Gas & Electric	IOU	Cenergy Power
Peanut Farm Solar	1.8	No	NC Eastern Municipal Power Agency	Public Power	Strata Solar
Peninsula Solar	2	PJM	Delmarva Power and Light	IOU	Greenwood Energy
NC One	2	No	Dominion NC Power	IOU	
Loy Farm Solar	2	No	Duke Energy Carolinas	IOU	Loy Farm Solar
Warsaw Solar	2	No	duke Energy Carolinas	IOU	Warsaw Solar
Anderson Solar	2	No	Duke Energy Carolinas		
Sampson Solar	2	No	Duke Energy Carolinas		
Faison Solar	2	No	Duke Energy Carolinas		
Chinquapin Solar	2	No	Duke Energy Carolinas		
Dunn Solar Farm II	2	No	Duke Energy Carolinas	IOU	FLS
Kenansville Solar 2	2	No	Duke Energy Carolinas	IOU	Kenansville Solar
Central Farm 2	2	No	Duke Energy Carolinas	IOU	
Taylor Solar Farm	2	No	Duke Energy Carolinas	IOU	
Lakeland	2	No	Georgia Power	IOU	Invenergy
West Greenwich Solar	2	ISO NE	National Grid (RI DG contract program)	IOU	ConEd Developments
Jamestown	2	CA ISO	Pacific Gas & Electric	IOU	Foristar
St Albans	2	ISO NE	VEEP	Multiple	St. Albans Solar Partners
Slayton	2	MISO	Xcel	IOU	Ecos Energy
Limerick Road	2.2	ISO NE	Vermont Electric Power Producers (VEEP)	Purchasing Agent for all utilities	Limerick Road Solar
Sheldon Springs	2.2	ISO NE	VEEP	Multiple	EGP Solar

Ownership by Non-Utility Entity/PPA with a Utility

Name	MW	RTO	Purchaser	Type	Owner
Sterling Solar	2.4	ISO NE	Sterling Municipal Light Dept	Public Power	Canadian Solar INDU Solar
Wright Solar Farm	2.5	No	Georgia Power	IOU	KPG Solar Electric
Desert Hot Springs	2.5	CA ISO	Southern California Edison	IOU	Aloha Systems
Roswell Plant	2.5	No	Xcel	IOU	Green States Energy
Castalia	2.7	No	Duke Energy Carolinas	IOU	Strata Solar
Franklin II	2.7	No	Duke Energy Carolinas	IOU	Strata Solar
Lake County East Chicago	2.7	MISO	NIPSCo	IOU	Community Energy
Griffith	2.7	MISO	NIPSCo	IOU	Community Energy
Wapakoneta	3	PJM	City of Wapakoneta	Public Power	Solar Planet
Audrey	3	No	Duke Energy Carolinas	IOU	Sunlight Partners
Minnie	3	No	Duke Energy Carolinas	IOU	Sunlight Partners
Colleton Solar	3	No	SC Electric Co-ops & Santee Cooper	Public Power/ Co-op	TIG Sun Energy
Newberry Springs	3	CA ISO	Southern California Edison	IOU	Soitech SA
Berkeley East	3	ISO NE	Taunton Municipal Lighting Plant	Public Power	Canadian Solar & INDU Solar Holdings
Agawam Solar	3.6	ISO NE	WMECO	IOU	Citizens Energy
Forbes Street Landfill	3.7	ISO NE	National Grid	IOU	CME Energy
Gridley Solar	4.2	CA ISO	NCPA customers	Public Power	Lightbeam
Celina Solar	5	PJM	City of Celina	Public Power	Solarvision
Somers	5	ISO NE	Connecticut Light & Power	IOU	Dominion
Dibrell Solar Farm	5	No	Duke Energy Carolinas	IOU	Strata Solar
Garrell	5	No	Duke Energy Carolinas	IOU	Strata Solar
Wagstaff	5	No	Duke Energy Carolinas	IOU	Strata Solar
Hawkins	5	No	Duke Energy Carolinas	IOU	Sunlight Partners
Nick	5	No	Duke Energy Carolinas	IOU	Sunlight Partners
Kalaeloa Solar Park	5	No	Hawaiian Electric	IOU	Hanwha Q Cells
Grassland Solar	5	CA ISO	Pacific Gas & Electric	IOU	County of Yolo
Rio Grande	5	CA ISO	Southern California Edison	IOU	Google & KKR
Snow Hill I & Ii	5.4	No	Duke Energy Carolinas	IOU	Strata Solar

Ownership by Non-Utility Entity/PPA with a Utility

Name	MW	RTO	Purchaser	Type	Owner
East and West Wayne	5.4	No	Duke Energy Carolinas	IOU	Strata Solar
Angier Solar	5.5	No	Duke Energy Carolinas	IOU	Strata Solar
Outback	5.7	No	Portland General	IOU	Exelon
White Cross	6	No	Duke Energy Carolinas	IOU	Strata Solar
Mooring Farm	6	No	Duke Energy Carolinas	IOU	Strata Solar
Haynes Solar Farm	6	No	Duke Energy Carolinas	IOU	Strata Solar
Yanceyville	6	No	Duke Energy Carolinas	IOU	Strata Solar
Moore Solar	6	No	Duke Energy Carolinas	IOU	Strata Solar
Kalaeloa Solar One	6	No	Hawaii Electric Company	IOU	Keahole Solar Power LLC
Foresight Solar	6	No	Tucson Electric	IOU	Foresight
Two Lines Farm	6.4	No	Duke Energy Carolinas	IOU	Strata Solar
Waco Solar	6.4	No	Duke Energy Carolinas	IOU	Strata Solar
Marshville	6.4	No	Duke Energy Carolinas	IOU	Strata Solar
Lenoir Farm 2	6.4	No	Duke Energy Carolinas	IOU	Strata Solar
Bailey	6.4	No	Duke Energy Carolinas	IOU	Strata Solar
Pate	6.4	No	Duke Energy Carolinas	IOU	Strata Solar
Fuquay Solar Farm	6.4	No	Duke Energy Progress, Inc.	IOU	Strata Solar
Lenoir Farm 1	6.5	No	duke Energy Carolinas	IOU	Strata Solar
Wilson Farm 1	6.5	No	Duke Energy Carolinas	IOU	Srata Solar
McCallum Farm	6.5	No	Duke Energy Carolinas	IOU	Strata Solar
Dement Farm	6.5	No	Duke Energy Carolinas	IOU	Strata Solar
McKenzie Farm	6.5	No	Duke Energy Carolinas	IOU	Strata Solar
Bolton Farm	6.5	No	Duke Energy Progress	IOU	Strata Solar
AM Best	6.65	No	Duke Energy Carolinas	IOU	Srata Solar
Mt. Olive	6.65	No	Duke Energy Carolinas	IOU	Srata Solar
Azalea	7.7	No	Cobb Electric Membership Corp	Co-op	Dominion
Belectric (Four projects)	9	CA ISO	Southern California Edison	IOU	sPower
Bryan Solar Park Holdings LLC	10	ERCOT	Bryan Texas Utilities	Co-op	MIC Energy
Black Mountain	10	No	UniSource	IOU	Duke Energy
McGuire Dix	12	PJM	Jersey Central Power & Light	IOU	Trinity Solar
Indianapolis Intl Airport	12.5	MISO	Indianapolis Power & Light	IOU	eT Energy Solutions
Valencia	13	No	Tucson Electric Power	IOU	E.ON
Badger	15	No	Arizona Public Service	IOU	PSEG Solar Source

Ownership by Non-Utility Entity/PPA with a Utility

Name	MW	RTO	Purchaser	Type	Owner
Simon Solar	20	No	Georgia Power	IOU	Simon Solar LLC
Imperial Solutions	20	CA ISO	Imperial Irrigation District	Public Power	Sol Orchard
Atwell Island Solutions	20	CA ISO	Pacific Gas & Electric	IOU	Solar Project
TA High Desert	20	CA ISO	Pacific Gas & Electric	IOU	NRG
White River	20	CA ISO	Pacific Gas & Electric	IOU	ConEd Developments
Kansas South	20	CA ISO	Pacific Gas & Electric, Southern California Edison	IOU	NRG
Highlander	21	CA ISO	Pacific Gas & Electric	IOU	Duke Energy
SPS Corcoran	21	CA ISO	Pacific Gas & Electric	IOU	Consolidated Edison
Indy Solar I, II, and III	28.6	MISO	Indianapolis Power & Light	IOU	Dominion
Spectrum Solar	30	No	NV Energy	IOU	Southern Power
Arlington Valley	33	CA ISO	San Diego Gas & Electric	IOU	LS Power
Victor Phelan	33	CA ISO	Southern California Edison	IOU	Google & KKR
Alamo 1	41	ERCOT	CPS Energy	Public Power	OCI
Ocotillo Express	43	CA ISO	San Diego Gas & Electric	IOU	Riverstone Holding LLC
Alpine Solar	66	CA ISO	PG&E	IOU	NRG
Catalina Solar Phase 2	83	CA ISO	San Diego Gas & Electric	IOU	EDF/ TIAA-CREF
Antelope Valley	100	CA ISO	PG&E	IOU	Exelon
Arlington Valley Solar Energy Project II	125	CA ISO	San Diego Gas & Electric	IOU	LS Power
Centinela Solar	125	CA ISO	San Diego Gas & Electric	IOU	LS Power
Imperial Valley	130	CA ISO	San Diego Gas & Electric	IOU	Tenaska
Campo Verde	139	CA ISO	San Diego Gas & Electric	IOU	Southern Power
Valley Solar Ranch 2, 3 and 4	228	CA ISO	PG&E	IOU	NRG
Topaz Solar Farm	550	CA ISO	Pacific Gas & Electric	IOU	MidAmerican Solar

Ownership by Non-Utility Entity/PPA with a Utility

Name	MW	RTO	Purchaser	Type	Owner
Wind					
Delta Wind Expansion	1	No	Golden Valley Electric Cooperative	Co-op	Alaska Environmental Power
Huerfano River Power	6	No	San Isabel Electric Association	Co-op	New Centennial
Brahms Wind	20	No	Western Farmer Electric Coop & Farmers Electric Cooperative Corp.	Co-op	Baywar.e.
Colorado Highland	23	No	Tri-State	Co-op	Alliance Power
Cowboy Wind Farm	60	No	Oklahoma Gas & Electric	IOU	NextEra
Steele Flat	75	SPP	Nebraska Public Power District	Public Power	NextEra
Beebe Community	82	MISO	Consumers Energy Co	IOU	Exelon
Tuscola Bay Wind Farm II	100	MISO	DTE Electric	IOU	NextEra
Los Vientos I and II	402	ERCOT	CPS Energy and Austin Energy	Public Power	Duke Energy
Flat Ridge 2 Wind Farm	470	No	Southwestern Electric Power Co, Associated and Arkansas Electric Cooperatives	Co-op	BP Wind Energy

Ownership by Non-Utility/PPA with Individual Customer

Name	MW	RTO	Purchaser	Owner
Biogas/Biomass				
Gettysburg Energy and Nutrient Recovery	3.25	PJM	Hillandale Farms	Waste Management
Central Florida Energy Garden	3.2	No	Reedy Creek Improvement District	Florida Harvest Power
PWD Biogas	5.6	PJM	Philadelphia Water Dept	Ameresco
Napoleon Biogas	2.8	PJM	Campbells Soup	Kearsage Energy
NPI USA Cogen Project	22	No	Customers confidential	Nippon Paper
Hydropower				
Rainbow	60	No	Various Customers	Consolidated Edison
Cheoah Upgrade	27	No	Not Stated*	Brookfield Renewable Energy
Landfill Gas				
Zook Generating	3.2	PJM	L&S Sweeteners	Granger Energy
Tullytown	1.6	PJM	Tullytown Landfill*	Siemens
Solar				
White Sand Missile Range	4.5	No	US Army	Citizens Energy
Whately Solar	1.8	ISO NE	Town of Whately, Franklin County Jail	Green Choice
Fort Bliss	1	No	Paradise Valley School District	KDC Solar
North Jersey Media	5	PJM	North Jersey Media Group	Bosch Solar
Bosch Maui County Solar	1.9	No	Multiple County Facilities	BLU Leaf Energy Inc.
Tanque Verde UFD Solar	1.15	No	Tanque Verde Unified School District	Marina Energy
Millville Solar	1.5	PJM	City of Millville	Hannon Strong Solar
Fort Bliss	1.4	ERCOT	Fort Bliss US Army	KDC Solar Apple
Middlesex Apple Orchard	6.4	PJM	Middlesex County	Bithenergy
U of MD Medical Center Solar	3.7	PJM	U of MD Medical Center Hospitals	Melink Corp
Cedarville U Solar	2.2	PJM	Cedarville University	Affordable Solar
Silver City Wastewater Treatment	1	No	Silver City WW Treatment Plant	ConEdison Develpments
Dartmouth Solar	1.3	ISO NE	Town of Dartmouth	SolarCity
East Bridgewater Solar	2.45	ISO NE	Town of East Bridgewater	Soltas Energy
Orange Solar Farm	3.35	ISO NE	City of Lowell	Consolidated Edison
Northbridge Solar	2.5	ISO NE	Cities of Northbridge & Milford	WGL Holdings
Bellingham Solar	3.8	ISO NE	City of Bellingham	Constellation Solar

Ownership by Non-Utility/PPA with Individual Customer

Name	MW	RTO	Purchaser	Owner
Owens Corning Delma Solar	2	NY ISO	Owens Corning	Southern Sky
Ravenbbrook Farms Landfill	6	ISO NE	Cape Cod Health Care	Borrego Solar
Ludlow Solar	2.7	ISO NE	Town of Ludlow	Washington Gas
Marshfield Solar	4	ISO NE	Town of Marshfield	Washington Gas
Maynard Solar	1.2	ISO NE	Town of Maynard	Ameresco Inc.
Sudbury Solar	1.5	ISO NE	Town of Sudbury	Brightfields Development
Scituate Solar	3	ISO NE	Town of Scituate	SolarFlair
Charlton	2	ISO NE	Clark University	CH4
Rio Rancho Solar	2.4	No	Rio Rancho Schools	NRG
Mt. St. Marys Solar 1 and 2	8.4	ISO NE	Town of Franklin	Energy Works
Grafton Water District	1.7	ISO NE	Grafton Water District	PPL Montana*
Lincoln Financial Solar	3	PJM	Philadelphia Eagles	Borrego Solar
Wilson Solar	2.5	ISO NE	Town of Spencer	Consolidated Edison
Quittacas Pond	3.5	ISO NE	New Bedford Water Treatment	SolarCity
Queen Anne's	2.4	PJM	Queen Anne's County	SolarCity
Centreville	1	PJM	Centreville	Equity Industrial Turbines
Wind				
Gloucester Wind	4	ISO NE	City of Gloucester	Solaya Energy

Ownership by Non-Utility/PPA with Merchant Generator or Power Marketer

Name	MW	RTO	Purchaser	Owner
Landfill Gas				
Hay Road Landfill	1.6	CA ISO	Marin Energy Authority	G2
Solar				
Maryland Solar	20	PJM	FirstEnergy Solutions	Maryland Solar LLC

Ownership by Utility for Customer Load

Name	MW	RTO	Owner	Type
Biogas/Biomass				
HNL Emergency Power*	8	No	Hawaii Electric Corporation	IOU
Hometown BioEnergy	8	MISO	Minnesota Municipal Power Agency	Public Power
Halifax County Biomass*	49	PJM	NOVEC	Co-op
Coal				
Edwardsport IGCC	618	MISO	Duke Energy	IOU
Oil				
Tucumari	23	No	Xcel	IOU
Quay County	23	No	Excel	IOU
Gowrie Municipal Utilities	2.1	MISO	Gowrie Municipal Utilities	Public Power
Gastonia Prime Power Park	3.6	No	NC Municipal Power Agency	Public Power
West Bend	2.5	MISO	City of West Bend	Public Power
Fuel Cell				
Cal State Fuel Cell	1.4	CAISO	Southern California Edison	IOU
Hydropower				
South Canal	7	No	Delta Montrose	Co-op
Lockhart and Pacolet	1.9	No	Lockhart Power	IOU
Cushman Expansion	3.6	No	Tacoma Public Utilities	Public Power
Wanapum Expansion	20	No	Grant PUD	Public Power
Lower Baker Expansion	30	No	Puget Sound Energy	IOU
Redwood Falls	0.5	MISO	Redwood Falls	Public Power
Landfill Gas				
JBER Landfill	1.5	No	Doyon Utilities	IOU
Tullytown Facility	1.6	PJM	PECO Energy	IOU
Natural Gas				
Lonesome Creek Generating Station	145	No	Basin Electric Coop	Co-op
Pioneer Generating Station 1	45	No	Basin Electric Coop	Co-op
Aberdeen Expansion	60	No	Northwestern Energy	IOU
Jones Generating Station Expansion	180	ERCOT	Xcel	IOU
Southcentral Power	183	No	Municipal Light & Power & Chugach Electric Association	Public Power/Co-op

Ownership by Utility for Customer Load

Name	MW	RTO	Owner	Type
LV Sutton	625	No	Duke Energy	IOU
Cape Canaveral Next Generation Clean Energy Center	1,157	No	Florida Power & Light	IOU
Mustang Station 4	145	ERCOT	Golden Spread Electric Cooperative	Co-op
Nikiski Combined Cycle Conversion Project	80	No	Homer Electric Association	Co-op
Haynes Repowering	600	CAISO	LADWP	Public Power
Reo Town Cogeneration	100	MISO	Lansing Board of Water & Light	Public Power
Rio Grande	95	No	El Paso Electric (NM)	IOU
Hamlet Expansion	56	No	NC Electric Membership Corp	Co-op
Hutchinson Plant	9.3	MISO	Hutchinson Utilities Commission	Public Power
Terry Bundy Phase 5	4.8	SPP	Lincoln Electric	Public Power
Solar				
Foothills Solar	35	No	Arizona Public Service	IOU
Hyder Solar II	14	No	Arizona Public Service	IOU
Gillespie	15	No	Arizona Public Service	IOU
Bruce Henry Solar	4	PJM	Delaware Electric Coop	Co-op
Pine Tree Solar	8.5	CAISO	LADWP	Public Power
Gates	20	CAISO	Pacific Gas & Electric	IOU
Guernsey	20	CAISO	Pacific Gas & Electric	IOU
West Gates	10	CAISO	Pacific Gas & Electric	IOU
Los Lunas	8	No	PSC of New Mexico	IOU
Manzano	2	No	PSC of New Mexico	IOU
Otero Solar Center	7.5	No	PSC of New Mexico	IOU
SPVP 048	5	CAISO	Southern California Edison	IOU
Prairie Fire	5	No	Tucson Electric	IOU
Wind				
Eva Creek Wind	25	No	Golden Valley Electric	Co-op

Ownership by Customer

Name	MW	RTO	Customer/Owner
Biogas/Biomass			
FDA White Oak Campus	82.4	PJM	Westvaco Corp
Graphic Packaging Biomass	40	No	Graphic Packaging
Fuel Cell			
Apple Maiden iCloud Data Center	10	No	Apple
CBS Studio Fuel Cells	2.4	CAISO	CBS
Landfill Gas			
MMSD Jones Island	9.2	MISO	Milwaukee Metro Sewerage Dist
UNC Landfill Gas	1.1	No	University of North Carolina
Natural Gas			
FDA White Oak Campus	19.5	PJM	FDA White Oak
Mehoopany Expansion	64	PJM	Procter and Gamble
Solar			
CBS Studio Solar	1.6	CAISO	CBS
Chattanooga Volkswagen	10	No	Volkswagon
Eubank Landfill Solar Array	2	No	Emcore
IKEA Perryville	2.7	PJM	IKEA
IKEA Westhampton	2.2	PJM	IKEA
Kingsburg Solar	2.2	CAISO	HMC Farm
LV WW Treatment Plant Solar	3	No	Las Vegas WW Treatment Plant
NREL Parking Garage	1.1	No	DOE NREL
Occidental College	1	CAISO	Occidental College
Rutgers Solar Farm Expansion	7	PJM	Rutgers University
Secaucus Solar Project	1.2	PJM	UPS
Shaw Industries	1.4	No	Shaw Industries
Apple Maiden iCloud Data Center	20	No	Apple
Wind			
Havilland Wind Farm	4.5	PJM	Havilland Plastics

Sale into Market/No Contract or Ownership

Name	MW	RTO	Owner
Hydropower			
Rio Expansion	0.8	NYISO	Eagle Creek
Mahoning Hydropower	6	PJM	Enduring Hydropower
Landfill Gas			
Oneida Herkimer Expansion	1.6	NYISO	Waste Management
Cape May County Municipal Utilities Authority (wastewater treatment)	2	PJM	CMCMU
Solar			
Holmdel Solar	3	PJM	OCI Solar Power
Brookfield Solar	2.5	ISO NE	Solventerra
Palmer Solar	1.2	ISO NE	Soltage
Frenchtown III	3.5	PJM	ConEdison Development

Sale into Market with Public Funding

Name	MW	RTO	Owner	Funding Source
Biogas				
Oskosh Biodigester	1.4	MISO	U-Wisconsin Oshkosh	Funding from UW Oshkosh Foundation
Flywheel/Frequency Regulation				
Hazle Township Flywheel Energy Storage	20	PJM	Beacon Power	DOE funded half under ARRA.
Hydropower				
Holtwood Expansion	125	PJM	PPL Holtwood LLC	Received ARRA grants greater than $100 million.
Natural Gas				
WA Parish Plant	75	ERCOT	NRG	Part of a DOE-funded carbon capture demonstration to be fully operational in 2016
Dover Energy Center Repowering	106	PJM	NRG	$500 K grant from the Delaware Energy Efficiency Investment Fund.