



Monitoring
Analytics

**New Generation in the PJM Capacity
Market: MW and Funding Sources for
Delivery Years 2007/2008 through
2018/2019**

The Independent Market Monitor for PJM

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Introduction

This report, prepared by the Independent Market Monitor for PJM (IMM or MMU), presents an analysis of new generation capacity in the Reliability Pricing Model (RPM) Capacity Market, from its inception in 2007/2008 through 2018/2019.^{1 2} For prior Delivery Years (DYs) (2007/2008 through 2014/2015), new generation capacity is defined as capacity that came into service in the specified DY including new generation resources, reactivations of previously deactivated generation resources, and uprates to existing generation resources. For the current and future DYs (2015/2016 through 2018/2019), new generation capacity is defined as capacity that cleared an RPM Auction for the first time in the specified DY.

This report also responds to the American Public Power Association's (APPA) 2014 report on the sources of funding for new capacity.³

Analysis of PJM Generation Capacity

New Generation Capacity

Changes in Generation Capacity: 2007/2008 through 2014/2015

Table 1 shows a summary of new generation capacity internal to PJM for each DY since the implementation of RPM in the 2007/2008 Delivery Year through the 2014/2015 Delivery Year. The average was 1,914.8 MW of new generation capacity per DY, and the peak was 3,786.8 MW added in the 2011/2012 Delivery Year.

¹ Delivery Years are from June 1 through May 31.

² This report includes all RPM Auctions held before August 24, 2015.

³ See "Power Plants Are Not Built on Spec 2014 Update," http://www.publicpower.org/files/PDFs/Power_Plants_Not_Built_on_Spec_2014.pdf (October 2014).

Table 1 PJM internal generation capacity additions: 2007/2008 through 2014/2015

	ICAP (MW)			Total Additions
	New	Reactivations	Uprates	
2007/2008	372.8	156.8	1,238.1	1,767.7
2008/2009	812.9	6.3	1,108.9	1,928.1
2009/2010	188.1	13.0	370.4	571.5
2010/2011	1,751.2	16.0	587.3	2,354.5
2011/2012	3,095.0	138.0	553.8	3,786.8
2012/2013	266.4	79.0	364.5	709.9
2013/2014	264.7	20.9	397.9	683.5
2014/2015	3,036.0	0.0	480.4	3,516.4
Total	9,787.1	430.0	5,101.3	15,318.4

Table 2 shows a summary of decreases in capacity internal to PJM for each DY since the implementation of RPM in the 2007/2008 Delivery Year through the 2014/2015 Delivery Year. The average was 3,162.2 MW per DY, and the peak was 11,442.9 MW deactivated in the 2014/2015 Delivery Year.

Table 2 PJM internal generation capacity decreases: 2007/2008 through 2014/2015

	ICAP (MW)		
	Deactivations	Derates	Total Losses
2007/2008	389.5	617.8	1,007.3
2008/2009	615.0	612.4	1,227.4
2009/2010	472.4	171.2	643.6
2010/2011	1,439.2	286.9	1,726.1
2011/2012	2,758.5	313.0	3,071.5
2012/2013	4,152.1	267.6	4,419.7
2013/2014	4,027.7	420.0	4,447.7
2014/2015	11,442.9	221.0	11,663.9
Total	25,297.3	2,909.9	28,207.2

Table 3 shows a summary of the net changes in PJM internal capacity since the implementation of RPM in the 2007/2008 Delivery Year through the 2014/2015 Delivery Year. While new capacity was added, it was more than offset by deactivations and derates, for a net decrease of 12,888.8 MW since the implementation of RPM through the 2014/2015 Delivery Year. This net decrease of capacity was offset in the PJM capacity market in part by Demand Resources (DR) and Energy Efficiency (EE) Resources. While DR and EE are not comparable to generation resources, PJM rules treated DR and EE as

substitutes for generation capacity subject to limits in some auctions. For example, on June 1, 2014, there were 9,493.6 MW of DR and EE Resources committed as RPM capacity.⁴

Table 3 Net changes in PJM internal generation capacity: 2007/2008 through 2014/2015

	ICAP (MW)		
	Net Additions	Net Losses	Net Change
2007/2008	1,767.7	1,007.3	760.4
2008/2009	1,928.1	1,227.4	700.7
2009/2010	571.5	643.6	(72.1)
2010/2011	2,354.5	1,726.1	628.4
2011/2012	3,786.8	3,071.5	715.3
2012/2013	709.9	4,419.7	(3,709.8)
2013/2014	683.5	4,447.7	(3,764.2)
2014/2015	3,516.4	11,663.9	(8,147.5)
Total	15,318.4	28,207.2	(12,888.8)

Table 4 shows changes in PJM capacity including capacity imports and exports and the integration of new zones into PJM. When imports and exports and the integration of new zones are included, PJM capacity increased by 13,078.0 MW since the implementation of RPM in 2007/2008 through 2014/2015. A significant portion of the increase occurred in the 2011/2012 Delivery Year as a result of the ATSI Zone integration into PJM.⁵

⁴ The IMM reports DR and EE RPM commitments in the State of the Market Reports. For example, see Table 5-9 in the *2015 Quarterly State of the Market Report for PJM: January through September*, Section 5, “Capacity Market.”

⁵ In June 2011, the American Transmission Systems, Inc. (ATSI) Control Zone joined PJM. In January 2012, the Duke Energy Ohio/Kentucky Control Zone joined PJM. In June 2013, the Eastern Kentucky Power Cooperative (EKPC) joined PJM. For additional information on the integrations, their timing and their impact on the footprint of the PJM service territory prior to 2015, see *2014 State of the Market Report for PJM*, Volume II, Appendix A, “PJM Geography.”

Table 4 PJM generation capacity changes: 2007/2008 through 2014/2015

	ICAP (MW)					Net Total Change
	Net Additions	Net Losses	Net Change in Capacity Imports	Net Change in Capacity Exports	Integration	
2007/2008	1,767.7	1,007.3	(96.7)	143.9	0.0	519.8
2008/2009	1,928.1	1,227.4	871.1	(1,702.9)	0.0	3,274.7
2009/2010	571.5	643.6	68.6	735.9	0.0	(739.4)
2010/2011	2,354.5	1,726.1	187.2	(427.0)	11,821.6	13,064.2
2011/2012	3,786.8	3,071.5	262.7	(1,374.5)	3,607.4	5,959.9
2012/2013	709.9	4,419.7	841.8	(17.3)	2,680.0	(170.7)
2013/2014	683.5	4,447.7	2,229.2	21.6	0.0	(1,556.6)
2014/2015	3,516.4	11,663.9	946.9	73.3	0.0	(7,273.9)
Total	15,318.4	28,207.2	5,310.8	(2,547.0)	18,109.0	13,078.0

The changes in capacity reported here are based on resources that are in service, including approved capacity modifications and updates. The IMM also reports on changes to in service capacity in the State of the Market Reports.⁶ Additions to in service capacity do not include proposed projects or capacity that clears in RPM Auctions but is not in service in the indicated year.

PJM reports capacity additions based on a different metric. PJM reports capacity additions in its Base Residual Auction (BRA) Report each year.⁷ The new capacity reported by PJM is based on BRA over BRA changes and does not account for in service status.⁸ The capacity additions reported by PJM for the 2016/2017 BRA and later BRAs are based on offered new capacity, and prior to the 2016/2017 BRA, the capacity additions reported by PJM included capacity modifications that were not offered. PJM does not update the reported values to account for whether the capacity is in service.

Table 5 compares the PJM and IMM reported new capacity through June 1, 2015. The IMM reported new capacity total is 6,053.4 MW lower than the PJM reported total for the same time period. The difference is a result of the fact that the IMM reports in service capacity while PJM reports offered capacity.

⁶ See 2015 Quarterly State of the Market Report for PJM: January through June, Section 5, "Capacity Market," p. 189.

⁷ For example, see PJM's "2018/2019 Base Residual Auction Report," <<http://www.pjm.com/~media/markets-ops/rpm/rpm-auction-info/2018-2019-base-residual-auction-report.ashx>> (August 28, 2015), pp. 22-26.

⁸ The IMM also reports on BRA over BRA changes in the IMM Base Residual Auction Reports.

Table 5 Comparison between IMM and PJM reported new capacity: June 1, 2007, through June 1, 2015⁹

	ICAP (MW)											
	IMM				PJM				Difference			
	New Reactivations	Uprates	Total	New Reactivations	Uprates	Total	New Reactivations	Uprates	Total			
2006/2007				19.0	47.0	536.0	602.0	(19.0)	(47.0)	(536.0)	(602.0)	
2007/2008	372.8	156.8	1,238.1	1,767.7	93.1	131.0	500.1	724.2	279.7	25.8	738.0	1,043.5
2008/2009	812.9	6.3	1,108.9	1,928.1	476.3	0.0	796.0	1,272.3	336.6	6.3	312.9	655.8
2009/2010	188.1	13.0	370.4	571.5	1,027.7	170.7	577.8	1,776.2	(839.6)	(157.7)	(207.4)	(1,204.7)
2010/2011	1,751.2	16.0	587.3	2,354.5	2,332.5	181.0	1,062.8	3,576.3	(581.3)	(165.0)	(475.5)	(1,221.8)
2011/2012	3,095.0	138.0	553.8	3,786.8	1,108.0	0.0	785.5	1,893.5	1,987.0	138.0	(231.7)	1,893.3
2012/2013	266.4	79.0	364.5	709.9	1,320.2	0.0	417.3	1,737.5	(1,053.8)	79.0	(52.8)	(1,027.6)
2013/2014	264.7	20.9	397.9	683.5	1,100.6	9.0	473.2	1,582.8	(835.9)	11.9	(75.3)	(899.3)
2014/2015	3,036.0	0.0	480.4	3,516.4	7,658.9	0.0	548.1	8,207.0	(4,622.9)	0.0	(67.7)	(4,690.6)
Total	9,787.1	430.0	5,101.3	15,318.4	15,136.3	538.7	5,696.8	21,371.8	(5,349.2)	(108.7)	(595.5)	(6,053.4)

Future Changes in Generation Capacity

As shown in Table 6, a total of 21,001.1 MW of additional generation capacity have cleared in the RPM Auctions for the 2015/2016 through 2018/2019 Delivery Years. Of this, 3,995.1 MW are already in service and included in the 15,318.4 MW of added capacity reported in Table 1.

The 2018/2019 Delivery Year reflects the implementation of the Capacity Performance (CP) rules.¹⁰ Since RPM Auctions are held for future DYs, proposed projects can be offered and cleared in the RPM Auctions before they are in service.

Table 6 shows the cleared MW in RPM Auctions for new generation resources, reactivations, and uprates in each future DY, by current interconnection queue status. In order to be offered in a PJM BRA for a DY prior to 2019/2020, a project must have completed its System Impact Study (SIS).^{11 12} The 3,995.1 MW In Service are included in historic increases in capacity (Table 1).

⁹ The new capacity in 2006/2007 represents new capacity which PJM reported as capacity added at or prior to June 1, 2007 and is associated with the 2007/2008 BRA.

¹⁰ 151 FERC ¶ 61,208 (2015).

¹¹ PJM. “Manual 18: PJM Capacity Market,” Revision 29 (October 16, 2015), p. 51.

¹² Effective with the 2019/2020 Delivery Year, PJM rules require that a Facilities Study Agreement must be executed for proposed generation resources greater than 20 MW in order to be offered in a PJM BRA.

The SIS is the second study of three required studies for every generation project in the interconnection queue. Together, these studies determine the feasibility, impact, and cost of interconnecting new generation projects. To proceed to the status of under construction, all three studies must be completed and a project developer must have signed an Interconnection Service Agreement (ISA) and a Construction Service Agreement (CSA).

Table 6 Project status of added generation capacity that cleared MW in RPM: 2015/2016 through 2018/2019, as of September 30, 2015

Status	2015/2016		2016/2017		2017/2018		2018/2019		Total		
	Cleared MW (ICAP)	Percentage	Cleared MW (ICAP)	Percentage	Cleared MW (ICAP)	Percentage	Cleared MW (ICAP)	Percentage	Cleared MW (ICAP)	Percentage	
Not yet in service											
Completed SIS	New/Reactivations	0.0	0.0%	0.0	0.0%	1,000.0	16.9%	2,588.1	58.8%	3,588.1	17.1%
	Uprates	470.1	8.7%	3.0	0.1%	50.0	0.8%	10.0	0.2%	533.1	2.5%
Executed CSA	New/Reactivations	1,627.3	30.3%	4,984.8	94.0%	4,602.3	77.7%	1,431.5	32.5%	12,645.9	60.2%
	Uprates	30.9	0.6%	40.0	0.8%	61.9	1.0%	106.1	2.4%	238.9	1.1%
Total not in service		2,128.3	39.6%	5,027.8	94.8%	5,714.2	96.5%	4,135.7	94.0%	17,006.0	81.0%
In service											
	New/Reactivations	2,760.4	51.4%	50.6	1.0%	0.0	0.0%	0.0	0.0%	2,811.0	13.4%
	Uprates	486.8	9.1%	225.1	4.2%	209.8	3.5%	262.4	6.0%	1,184.1	5.6%
Total in service		3,247.2	60.4%	275.7	5.2%	209.8	3.5%	262.4	6.0%	3,995.1	19.0%
Total Cleared		5,375.5	100.0%	5,303.5	100.0%	5,924.0	100.0%	4,398.1	100.0%	21,001.1	100.0%

In addition to proposed generation resources, planned deactivations will also affect the PJM capacity level over the current and the next three DYs. Table 7 shows the net effect of proposed generation resources that cleared an RPM Auction that are not yet in service and proposed deactivations that have not yet occurred.¹³

Table 7 Proposed net change in generation capacity: 2015/2016 through 2018/2019

	ICAP (MW)					Total
	2015/2016	2016/2017	2017/2018	2018/2019		
New generation & uprates (not yet in service)	2,128.3	5,027.8	5,714.2	4,135.7		17,006.0
Deactivations	(1,447.5)	(34.0)	(452.6)	(2,142.2)		(4,076.3)
Total	680.8	4,993.8	5,261.6	1,993.5		12,929.7

Based on the history of units in the queue, all the projects not yet in service in Table 7 will not go into service. Experience with units with comparable development status provides a guide to the proportion of projects that will go into service. The likelihood of completion rises significantly as projects proceed through the planning process. Analysis of historical interconnection queue data shows that 26.3 percent of MW for projects that completed a SIS went into service and 80.6 percent of MW that executed a Construction Service Agreement (CSA) went into service.

¹³ Completed and pending deactivations data from <<http://www.pjm.com/planning/generation-deactivation/gd-summaries.aspx>>

Based on this history, 1,083.9 MW of the MW with a completed SIS (.263 * 4,121.2) and 10,385.1 of the MW with an executed CSA (.806 * 12,884.8), or a total of 11,469.0 MW, are expected to go into service. Table 8 shows the annual capacity that is expected to be actually installed based on the total cleared generation MW in Table 7 and the percent completion based on history.

Table 8 Expected net change in generation capacity: 2015/2016 through 2018/2019

	ICAP (MW)				Total
	2015/2016	2016/2017	2017/2018	2018/2019	
Expected new generation (not yet in service)	1,460.1	4,050.8	4,035.5	1,922.6	11,469.0
Deactivations	(1,447.5)	(34.0)	(452.6)	(2,142.2)	(4,076.3)
Total	12.6	4,016.8	3,582.9	(219.6)	7,392.7

The total 11,469.0 MW expected to go into service are 67.4 percent of the 17,006.0 MW not yet in service. Adding the 3,995.1 MW already in service, 15,464.1 MW, or 73.6 percent (15,464.1/21,001.1), of new generation capacity that cleared MW in RPM (21,001.1 MW), as shown in Table 6, are expected to go into service through the 2018/2019 Delivery Year. Net of expected deactivations, 7,392.7 MW are expected to go into service through the 2018/2019 Delivery Year based on current information.

Sources of Funding

Developers use a variety of sources to fund their projects, including Power Purchase Agreements (PPA), cost of service rates, and private funds (from internal sources or private lenders and investors). PPAs can be used for a variety of purposes and the use of a PPA does not imply a specific source of funding. Table 9 shows the ICAP MW of new, reactivated, and uprated generation capacity resources in PJM by supplier type and by whether the funding was market or non-market, from the implementation of RPM in the 2007/2008 Delivery Year through the 2014/2015 Delivery Year. The supplier types are: merchant; municipal and cooperative utilities; and vertically integrated utilities. These supplier types use a mix of funding sources.

From 2007/2008 to 2014/2015, capacity from new units based on market funding was 5,822.6 MW (59.5 percent) and capacity from new units based on non-market funding was 3,964.5 MW (40.5 percent). Solar and wind projects accounted for 1,086.8 MW (11.1 percent) of the new generation from 2007/2008 to 2014/2015. The grand total of 9,787.1 MW for new capacity is equal to the total capacity from new units during this period (Table 1).

Reactivated capacity from reactivated units based on market funding was 372.0 MW (86.5 percent) and reactivated capacity from reactivated units based on non-market funding was 58.0 MW (13.5 percent) from 2007/2008 to 2014/2015. Solar and wind projects accounted for 0.0 MW (0.0 percent) of the reactivated generation from 2007/2008

to 2014/2015. The total of 430.0 MW is equal to the total reactivated capacity from reactivated units during this period. (Table 1)

Up-rated capacity from existing units based on market funding was 3,827.2 MW (75.0 percent) and up-rated capacity from existing units based on non-market funding was 1,274.1 MW (25.0 percent) from 2007/2008 to 2014/2015. Solar and wind projects accounted for 164.9 MW (3.2 percent) of the up-rated generation from 2007/2008 to 2014/2015. The total of 5,101.3 MW is equal to the total up-rated capacity from existing units during this period. (Table 1)

Table 9 New, reactivated, and up-rated generation capacity resources by funding and supplier type: 2007/2008 through 2014/2015

Funding and Supplier Type			ICAP (MW)				Total Additions	Total Percent
	New	Percent	Reactivations	Percent	Uprates	Percent		
Market								
Merchant								
Solar and Wind	670.1	6.8%	0.0	0.0%	65.7	1.3%	735.8	4.8%
Other	3,745.6	38.3%	171.2	39.8%	1,192.8	23.4%	5,109.6	33.4%
Total	4,415.7	45.1%	171.2	39.8%	1,258.5	24.7%	5,845.4	38.2%
Utility								
Solar and Wind	347.0	3.5%	0.0	0.0%	65.5	1.3%	412.5	2.7%
Other	1,059.9	10.8%	200.8	46.7%	2,503.2	49.1%	3,763.9	24.6%
Total	1,406.9	14.4%	200.8	46.7%	2,568.7	50.4%	4,176.4	27.3%
Market Total	5,822.6	59.5%	372.0	86.5%	3,827.2	75.0%	10,021.8	65.4%
Non Market								
Municipal/Coop								
Solar and Wind	69.7	0.7%	0.0	0.0%	0.0	0.0%	69.7	0.5%
Other	896.8	9.2%	0.0	0.0%	98.2	1.9%	995.0	6.5%
Total	966.5	9.9%	0.0	0.0%	98.2	1.9%	1,064.7	7.0%
Utility								
Solar and Wind	0.0	0.0%	0.0	0.0%	33.7	0.7%	33.7	0.2%
Other	2,998.0	30.6%	58.0	13.5%	1,142.2	22.4%	4,198.2	27.4%
Total	2,998.0	30.6%	58.0	13.5%	1,175.9	23.1%	4,231.9	27.6%
Non Market Total	3,964.5	40.5%	58.0	13.5%	1,274.1	25.0%	5,296.6	34.6%
Grand Total	9,787.1	100.0%	430.0	100.0%	5,101.3	100.0%	15,318.4	100.0%

Table 10 shows the projected new generation capacity resources by funding source and funding type for future DYs from 2015/2016 through 2018/2019. These data do not include projects already categorized as in service.¹⁴ New capacity based on market funding is 14,450.8 MW (85.0 percent) of proposed generation that cleared at least one RPM Auction for one of the four future DYs. New capacity based on non-market

¹⁴ See Table 6.

funding is 2,555.2 MW (15.0 percent) of proposed generation that cleared at least one RPM Auction for one of the four future DYs.¹⁵

Table 10 Projected new generation capacity resources by funding type and funding source: 2015/2016 through 2018/2019¹⁶

Funding Type	Funding Source	Cleared MW (ICAP)	Percent
Market	Private funding	14,450.8	85.0%
	Total	14,450.8	85.0%
Non Market	Cost of service	2,555.2	15.0%
	Total	2,555.2	15.0%
Grand Total		17,006.0	100.0%

APPA Report on Capacity Markets

New Generation Capacity Overview

The 2014 APPA report includes 14,738.0 MW of new generation capacity which APPA states were added in calendar year 2013 in the U.S., of which APPA defines 606.7 MW as PJM capacity. Table 11 shows actual PJM generation capacity resources compared to the PJM generation capacity resources reported by APPA. Of the 40 units listed in the 2014 APPA report as PJM capacity resources, 11 are PJM capacity resources while the remaining 29 units are either behind the meter or are energy only resources. The 2014 APPA report does not include eight PJM capacity resources that were added in 2013.¹⁷

Table 11 PJM new generation capacity resources: calendar year 2013

	Number of Resources	ICAP (MW)
Generation resources in APPA Appendix B specified as PJM Generation Capacity Resources	40	606.7
Generation resources in APPA Appendix B that are not PJM Generation Capacity Resources	(29)	(282.7)
Additional PJM Generation Capacity Resources not included in APPA Appendix B	8	75.7
Total new Generation Capacity Resources	19	399.7

¹⁵ Solar and wind projects account for 180.1 MW of the market funding, and 233.3 MW of the projected non-market funding.

¹⁶ Some categories of funding source have been combined in order to comply with PJM confidentiality rules. See PJM. "Manual 33: Administrative Services for the PJM Interconnection Operating Agreement," Revision 11 (May 29, 2014), p. 23.

¹⁷ These data are on a calendar year basis, consistent with the APPA report. Calendar year data are not directly comparable to Delivery Year data.

Sources of Funding

The 2014 APPA report asserts that the total of all PPA types funded 66.0 percent of new U.S. capacity MW in 2013.¹⁸ The report does not distinguish between market based PPAs and non-market based PPAs. APPA uses PPA as a synonym for non-market funding.

The 2014 APPA report states that 7,700.0 MW of merchant capacity cleared in the 2016/2017 and 2017/2018 PJM RPM Auctions. In fact, 8,264.2 MW of merchant capacity cleared in the 2016/2017 and 2017/2018 PJM RPM Auctions, all of which relied on market funding.

APPA recognizes that the level of merchant capacity “appears to mark a dramatic change in the pattern reported in this study.” But APPA asserts “PJM itself has acknowledged that only 20 percent of proposed new plants are built.”¹⁹

APPA’s asserted 20 percent completion rate is not correct for units that clear in a capacity auction.²⁰ The likelihood of completion increases significantly as projects proceed through the planning process. In order to be offered in a PJM BRA for a DY prior to 2019/2020, a project must have completed its SIS, which follows the Feasibility Study. Based on historical interconnection queue data, 26.3 percent of MW for projects that completed a SIS went into service, and 80.6 percent of MW that executed a Construction Service Agreement (CSA) went into service.

Of the 21,001.1 MW of new generation capacity that cleared in RPM auctions for DYs 2015/2016 through 2018/2019, as shown in Table 6 and Table 10, 16,854.2 MW (2,403.4 MW already in service) has market funding and 4,143.9 MW (1,588.7 MW already in service) has non-market funding. Applying the historical completion rates, 11,812.9MW,

¹⁸ See “Power Plants Are Not Built on Spec 2014 Update,” <http://www.publicpower.org/files/PDFs/Power_Plants_Not_Built_on_Spec_2014.pdf> (October 2014), p. 2.

¹⁹ See “Power Plants Are Not Built on Spec 2014 Update,” <http://www.publicpower.org/files/PDFs/Power_Plants_Not_Built_on_Spec_2014.pdf> (October 2014), p.5.

²⁰ At the time the APPA report was written, PJM had estimated that 19 percent of projects that entered the Feasibility Study phase went into service. See “Commercial Probability” at <<http://www.pjm.com/~media/committees-groups/committees/pc/20131010/20131010-item-09-commercial-probability.ashx>> (October 10, 2013), p.2.

or 70.0 percent, of the market funded projects are expected to go into service.²¹ Similarly, 3,648.2 MW, or 88.0 percent, of non-market funded projects are expected to go into service. Together, 15,461.1MW, or 73.6 percent (15,461.1/21,001.1), of total added generation capacity that cleared MW in RPM auctions for DYs from 2015/2016 through 2018/2019, including in service MW, (21,001.1 MW) are expected to go into service through the 2018/2019 Delivery Year. Of the 15,461.1 MW, 11,812.9 MW are market funded and 3,648.2 MW are non-market funded.

Conclusions

For the period from the introduction of the RPM capacity market design in the 2007/2008 Delivery Year through the 2014/2015 Delivery Year, internal installed capacity decreased by 12,888.8 MW after accounting for both capacity additions (15,318.4 MW) and capacity deactivations and derates (28,207.2 MW). See Table 3. PJM maintained a reserve margin in excess of the target reserve margin throughout this period. Substantial demand side resources were also added to the capacity market during this time period.

Looking ahead, based on cleared new generation capacity (17,006.0 MW), expected completion rates (11,469.0 MW), and pending deactivations (4,076.3 MW), PJM capacity is expected to increase by an additional 7,392.7 MW for the current and future DYs from 2015/2016 through 2018/2019. (See Table 7 and Table 8)

Between 2007/2008 and 2018/2019 DYs, PJM will have added 22,711.1 MW of capacity from new units, reactivations, and uprates (15,318.4 MW plus 7,392.7 MW).

New capacity from new units for this historical period based on market funding was 5,822.6 MW (59.5 percent) and new capacity from new units for this historical period based on non-market funding was 3,964.5 MW (40.5 percent) from 2007/2008 to 2014/2015, for a total of 9,787.1 MW.

Table 9 shows that of the 9,787.1 MW of new capacity (63.9 percent of all additions) that was added through the 2014/2015 DY, 5,822.6 MW (59.5 percent) were from market funded units and 3,964.5 MW (40.5 percent) were from non-market funded units.

²¹ The expectation based on historical data is that 1,083.9 MW of the market funded cleared MW with a completed SIS (.263 * 4,121.2) and 8,325.7 of the MW with an executed CSA (.806*10,329.6), or a total of 9,409.5 MW, will go into service. The total 9,409.5 MW expected to go into service are 65.1 percent of the 14,450.8 MW not yet in service. Adding the 2,403.4 MW already in service, 11,812.9 MW, or 70.0 percent (11,812.9/16,854.2) of market funded cleared MW is expected to go into service.

Funding of reactivated capacity from the 2007/2008 DY through the 2014/2015 DY totaled 430.0 MW (2.8 percent of all additions), with 372.0 MW from market funded units and 58.0 MW from nonmarket. Funding of uprates to existing capacity from the 2007/2008 DY through the 2014/2015 DY totaled 5,101.3 MW (33.3 percent of all additions), with 3,827.2 MW from market funded units and 1,274.1 MW from non-market.

Of the 17,006.0 MW of new generation capacity that cleared in RPM auction for DYs between 2015/2016 and 2018/2019, that is not yet in service, as shown in Table 6 and Table 10, 14,450.8 MW has market funding and 2,555.2 MW has non-market funding. Applying the historical completion rates, 9,409.5 MW, or 65.1 percent, of the market funded projects are expected to go into service.²² Similarly, 2,059.5 MW, or 80.6 percent, of non-market funded projects are expected to go into service. Together, 11,469.0 MW, or 67.4 percent (11,469.0/17,006.0), of new generation capacity that cleared MW in RPM (17,006.0 MW) and are not yet in service are expected to go into service through the 2018/2019 Delivery Year.

Of the 3,995.1 of new generation capacity that cleared in an RPM auction for DYs between 2015/2016 and 2018/2019, and is already in service, 2,403.4 MW is based on market funding. In summary, 16,854.2 MW (80.2 percent) of new generation capacity (2,403.4 MW in service, 14,450.8 not yet in service) that cleared in the RPM auctions for DYs between 2015/2016 and 2018/2019, is based on market funding. New capacity based on non-market funding is 4,143.9 MW (19.7 percent) of proposed generation that cleared at least one RPM Auction for DYs between 2015/2016 and 2018/2019, for a total of 21,001.1 MW.

The 2014 APPA report focused on new generation capacity added during the calendar year 2013. Table 11 shows the discrepancies between the APPA reported new and actual new PJM capacity resources. For example, APPA reported that 40 units (606.7 MW) were added in 2013, while the correct number is 19 units (399.7 MW). APPA reported that 7,700.0 MW of merchant capacity cleared in the 2016/2017 and 2017/2018 PJM RPM Auctions, while the correct value is 8,264.2 MW. APPA asserted that only 20 percent of proposed new plants are built while a better estimate of the expected completion rates when considering new generation that has cleared an RPM auction is 73.6 percent.

²² The expectation based on historical data is that 1,083.9.3 MW of the market funded cleared MW with a completed SIS (.263 * 4,121.2) and 8,325.7 of the MW with an executed CSA (.806*10,329.6), or a total of 9,409.5 MW, will go into service. The total 9,409.5 MW expected to go into service are 65.1 percent of the 14,450.8 MW not yet in service. Adding the 2,403.4 MW already in service, 11,812.9 MW, or 70.0 percent (11, 812.9/16,854.26) of market funded cleared MW is expected to go into service.