

Market Monitor Report

MC Webinar
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Incorrect Calculation of VOM Costs

- **The IMM identified an error in the calculation of VOM costs for many units that do not have a complete 10 year maintenance history.**
- **The error results in incorrect VOM costs.**
- **The error results from applying average costs from years with available data to prior years, for which data are not available.**
- **The inflation escalation factor, based on the Handy Whitman Index, was incorrectly applied to years with incomplete data.**

Incorrect Calculation of VOM Costs

- **Correct Calculation**

	Annual VOM Costs	Handy Whitman Escalation Factor	Escalated Annual VOM Cost	Annual MWh
2017	\$2,000,000	1.000	\$2,000,000	100,000
2016	\$1,000,000	1.034	\$1,034,000	200,000
2015	\$0	1.054	\$0	0
2014	\$0	1.098	\$0	0
2013	\$0	1.130	\$0	0
2012	\$0	1.144	\$0	0
2011	\$0	1.170	\$0	0
2010	\$0	1.222	\$0	0
2009	\$0	1.277	\$0	0
2008	\$0	1.238	\$0	0
TOTAL	\$3,000,000		\$3,034,000	300,000

Average VOM Cost $\$3034000 / 300000 \text{ MWh} = \10.11 per MWh

Incorrect Calculation of VOM Costs

- Incorrect Calculation

	Annual VOM Costs	Handy Whitman Escalation Factor	Escalated Annual VOM Cost	Annual MWh
2017	\$2,000,000	1.000	\$2,000,000	100,000
2016	\$1,000,000	1.034	\$1,034,000	200,000
2015	\$1,500,000	1.054	\$1,581,000	150,000
2014	\$1,500,000	1.098	\$1,647,000	150,000
2013	\$1,500,000	1.130	\$1,695,000	150,000
2012	\$1,500,000	1.144	\$1,716,000	150,000
2011	\$1,500,000	1.170	\$1,755,000	150,000
2010	\$1,500,000	1.222	\$1,833,000	150,000
2009	\$1,500,000	1.277	\$1,915,500	150,000
2008	\$1,500,000	1.238	\$1,857,000	150,000
TOTAL	\$15,000,000		\$17,033,500	1,500,000

Average VOM Cost $\$17033500 / 1500000 \text{ MWh} = \11.36 per MWh

Incorrect Calculation of VOM Costs

- **The IMM recommends that all Market Sellers that calculated their VOM costs using the incorrect method, recalculate their VOM costs using the correct method.**
- **Market Sellers are responsible for their own offers**

Report on capacity additions and retirements

- The IMM report “**Generation Additions and Retirements in the PJM Capacity Market: MW and Funding Sources for Delivery Years 2007/2008 through 2020/2021,**” can be found on the Monitoring Analytics website at:

http://www.monitoringanalytics.com/reports/Reports/2018/IMM_Generation_Additions_and_Retirements_in_the_PJM_Capacity_Market_20180309.pdf

Table 1 PJM internal generation capacity additions: 2007/2008 through 2016/2017

	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
2015/2016	5,497.8	0.0	409.0	5,906.8
2016/2017	2,537.8	537.0	589.8	3,664.6
Total	17,822.7	967.0	6,100.1	24,889.8

Table 2 PJM internal generation capacity decreases: 2007/2008 through 2016/2017

	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	421.9	4,449.6
2014/2015	11,442.9	221.0	11,663.9
2015/2016	863.4	156.4	1,019.8
2016/2017	1,447.3	168.6	1,615.9
Total	27,608.0	3,236.8	30,844.8

Table 3 Net changes in PJM internal generation capacity: 2007/2008 through 2016/2017

	ICAP (MW)		
	Additions	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	4,449.6	(3,766.1)
2014/2015	3,516.4	11,663.9	(8,147.5)
2015/2016	5,906.8	1,019.8	4,887.0
2016/2017	3,664.6	1,615.9	2,048.7
Total	24,889.8	30,844.8	(5,955.0)

Table 4 PJM generation capacity changes: 2007/2008 through 2016/2017

	ICAP (MW)					
	Additions	Losses	Integration	Net Change in Capacity Imports	Net Change in Capacity Exports	Net Change
2007/2008	1,767.7	1,007.3	0.0	(96.7)	143.9	519.8
2008/2009	1,928.1	1,227.4	0.0	871.1	(1,702.9)	3,274.7
2009/2010	571.5	643.6	0.0	68.6	735.9	(739.4)
2010/2011	2,354.5	1,726.1	11,821.6	187.2	(427.0)	13,064.2
2011/2012	3,786.8	3,071.5	3,607.4	262.7	(1,374.5)	5,959.9
2012/2013	709.9	4,419.7	2,680.0	841.8	(17.3)	(170.7)
2013/2014	683.5	4,449.6	0.0	2,217.2	21.6	(1,570.5)
2014/2015	3,516.4	11,663.9	0.0	859.1	73.3	(7,361.7)
2015/2016	5,906.8	1,019.8	0.0	787.6	285.1	5,389.5
2016/2017	3,664.6	1,615.9	0.0	(1,011.1)	(36.4)	1,074.0
Total	24,889.8	30,844.8	18,109.0	4,987.5	(2,298.3)	19,439.8

Table 5 Comparison between IMM and PJM reported new capacity: June 1, 2007, through June 1, 2017

	IMM				ICAP (MW) PJM				Difference			
	New	Reactivations	Uprates	Total	New	Reactivations	Uprates	Total	New	Reactivations	Uprates	Total
2006/2007				0.0	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)
2015/2016	5,497.8	0.0	409.0	5,906.8	5,314.3	21.0	1,470.7	6,806.0	183.5	(21.0)	(1,061.7)	(899.2)
2016/2017	2,537.8	537.0	589.8	3,664.6	5,388.8	991.0	473.7	6,853.5	(2,851.0)	(454.0)	116.1	(3,188.9)
Total	17,822.7	967.0	6,100.1	24,889.8	25,839.4	1,550.7	7,641.2	35,031.3	(8,016.7)	(583.7)	(1,541.1)	(10,141.5)

Table 6 Project status of added generation capacity that cleared MW in RPM: 2017/2018 through 2020/2021, as of January 1, 2018

Status		2017/2018		2018/2019		2019/2020		2020/2021		Total	
		Cleared		Cleared		Cleared		Cleared		Cleared	
		MW	Percent	MW	Percent	MW	Percent	MW	Percent	MW	Percent
		(ICAP)	Percent	(ICAP)	Percent	(ICAP)	Percent	(ICAP)	Percent	(ICAP)	Percent
Not yet in service											
Completed SIS	New/Reactivations	0.0	0.0%	142.2	2.8%	0.0	0.0%	483.2	15.1%	625.4	3.5%
	Upates	20.0	0.3%	0.0	0.0%	0.0	0.0%	33.2	1.0%	53.2	0.3%
Executed CSA	New/Reactivations	4,034.6	66.6%	3,699.1	71.8%	3,392.8	93.9%	2,319.9	72.4%	13,446.4	74.6%
	Upates	17.6	0.3%	458.5	8.9%	0.0	0.0%	26.0	0.8%	502.1	2.8%
Total not in service		4,072.2	67.2%	4,299.8	83.4%	3,392.8	93.9%	2,862.3	89.3%	14,627.1	81.1%
In service											
	New/Reactivations	1,674.2	27.6%	721.5	14.0%	56.9	1.6%	1.5	0.0%	2,454.1	13.6%
	Upates	311.9	5.1%	133.4	2.6%	164.3	4.5%	340.1	10.6%	949.7	5.3%
Total in service		1,986.1	32.8%	854.9	16.6%	221.2	6.1%	341.6	10.7%	3,403.8	18.9%
Total Cleared		6,058.3	100.0%	5,154.7	100.0%	3,614.0	100.0%	3,203.9	100.0%	18,030.9	100.0%

Table 7 Proposed net change in generation capacity: 2017/2017 through 2020/2021

	ICAP (MW)				Total
	2017/2018	2018/2019	2019/2020	2020/2021	
New generation and uprates (not yet in service)	4,072.2	4,299.8	3,392.8	2,862.3	14,627.1
Deactivations	(601.1)	(3,758.0)	(2,544.0)	0.0	(6,903.1)
Total	3,471.1	541.8	848.8	2,862.3	7,724.0

Table 8 Project status of added generation capacity that cleared MW in RPM (Adjusted for expected rate of completion): 2017/2018 through 2020/2021, as of January 1, 2018

Status		2017/2018		2018/2019		2019/2020		2020/2021		Total	
		Cleared		Cleared		Cleared		Cleared		Cleared	
		MW	Percent	MW	Percent	MW	Percent	MW	Percent	MW	Percent
Not yet in service											
Completed SIS	New/Reactivations	0.0	0.0%	41.2	1.4%	0.0	0.0%	140.1	7.6%	181.3	1.8%
	Uprates	5.8	0.2%	0.0	0.0%	0.0	0.0%	9.6	0.5%	15.4	0.2%
Executed CSA	New/Reactivations	2,906.7	99.4%	2,665.0	87.8%	2,444.3	100.0%	1,671.4	90.8%	9,687.4	94.5%
	Uprates	12.7	0.4%	330.3	10.9%	0.0	0.0%	18.7	1.0%	361.7	3.5%
Total not in service		2,925.2	100.0%	3,036.6	100.0%	2,444.3	100.0%	1,839.8	100.0%	10,245.9	100.0%

Table 9 Expected net change in generation capacity: 2017/2018 through 2020/2021

	ICAP (MW)				Total
	2017/2018	2018/2019	2019/2020	2020/2021	
New generation and uprates (not yet in service)	2,925.2	3,036.6	2,444.3	1,839.8	10,245.9
Deactivations	(601.1)	(3,758.0)	(2,544.0)	0.0	(6,903.1)
Total	2,324.1	(721.4)	(99.7)	1,839.8	3,342.8

Table 10 New, reactivated, and uprate generation capacity resources by funding and supplier type: 2007/2008 through 2016/2017

Funding and Supplier Type	New		ICAP (MW)		Uprates		Total Additions	Total Percent
	Percent	Reactivations	Percent	Uprates	Percent			
Market								
Merchant								
Solar and Wind	1,021.9	5.7%	0.0	0.0%	117.7	1.9%	1,139.6	4.6%
Other	9,341.7	52.4%	691.2	71.5%	1,661.4	27.2%	11,694.3	47.0%
Total	10,363.6	58.1%	691.2	71.5%	1,779.1	29.2%	12,833.9	51.6%
Utility								
Solar and Wind	341.7	1.9%	0.0	0.0%	72.9	1.2%	414.6	1.7%
Other	1,822.6	10.2%	200.8	20.8%	2,868.6	47.0%	4,892.0	19.7%
Total	2,164.3	12.1%	200.8	20.8%	2,941.5	48.2%	5,306.6	21.3%
Market Total	12,527.9	70.3%	892.0	92.2%	4,720.6	77.4%	18,140.5	72.9%
Non Market								
Municipal/Coop								
Solar and Wind	-	-	0.0	0.0%	-	-	0.0	0.0%
Other	758.4	4.3%	17.0	1.8%	131.7	2.2%	907.1	3.6%
Total	758.4	4.3%	17.0	1.8%	131.7	2.2%	907.1	3.6%
Utility								
Solar and Wind	-	-	0.0	0.0%	36.4	0.6%	36.4	0.1%
Other	4,536.4	25.5%	58.0	6.0%	1,211.4	19.9%	5,805.8	23.3%
Total	4,536.4	25.5%	58.0	6.0%	1,247.8	20.5%	5,842.2	23.5%
Non Market Total	5,294.8	29.7%	75.0	7.8%	1,379.5	22.6%	6,749.3	27.1%
Grand Total	17,822.7	100.0%	967.0	100.0%	6,100.1	100.0%	24,889.8	100.0%

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