

Unit Specific Nuclear ACR Information

MIC Special Session - MOPR
February 19, 2020

IMM



Monitoring Analytics

MOPR Issues

- **IMM posted a report on cost of new entry (CONE) and avoidable cost rate (ACR) values on 01.21.2020.**
 - https://www.monitoringanalytics.com/reports/Reports/2020/IMM_CONE_ACR_Preliminary_Report_20200121.pdf
- **The IMM calculated preliminary gross CONE, gross ACR, net CONE, and net ACR values for the basic technologies at issue in the Commission's December 19, 2019, MOPR Order.**
- **The IMM used the same approach to the calculations of gross CONE that the IMM has used in the State of the Market Reports and in the Triennial and Quadrennial Review processes.**

IMM Nuclear ACR Analysis

- **The IMM Preliminary Report on CONE and ACR used the same method for all technologies including nuclear.**
- **As explained, the IMM recommends use of the SOM unit specific nuclear ACR analysis rather than the Preliminary Report.**
- **IMM regularly reports on unit specific net ACR for all nuclear plants in PJM in the SOM.**
- **IMM SOM analysis of nuclear plant net ACR uses NEI avoidable cost data and unit specific net revenues based on forward looking energy and capacity prices.**

IMM Nuclear ACR Analysis

- IMM also presents net revenue and net ACR based on historical energy and capacity market prices.
- For recent IMM nuclear ACR analysis, see:
 - http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2018/2018-som-pjm-sec7.pdf
 - http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2019/2019q1-som-pjm-sec7.pdf
 - http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2019/2019q2-som-pjm-sec7.pdf
 - http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2019/2019q3-som-pjm-sec7.pdf

Nuclear Net ACR

- **The IMM calculates implied net ACR/required capacity price for each nuclear plant in PJM.**
- **Two options:**
 - **Gross ACR equal to NEI total cost including fuel; operating cost; and capital expenditures.**
 - **Gross ACR equal to NEI total cost including fuel and operating cost, excluding capital expenditures as a proxy for fixed VOM.**
- **FERC order on energy market offers required fixed VOM to be included in energy offers and excluded from avoidable costs (ACR).**

Revenues and Costs for Nuclear Plants

	ICAP (MW)	Average Forward LMP (\$/MWh)			Ancillary Revenue (\$/MWh)	2018 NEI Costs (\$/MWh)		
		2020	2021	2022	Reactive	Fuel	Operating	Capital
Beaver Valley	1,808	\$25.92	\$27.20	\$27.08	\$0.24	\$6.01	\$17.44	\$5.62
Braidwood	2,337	\$23.25	\$24.40	\$24.29	\$0.24	\$6.01	\$17.44	\$5.62
Byron	2,300	\$22.26	\$23.38	\$23.28	\$0.21	\$6.01	\$17.44	\$5.62
Calvert Cliffs	1,708	\$27.09	\$28.42	\$28.30	\$0.20	\$6.01	\$17.44	\$5.62
Davis Besse	894	\$25.84	\$27.12	\$27.01	\$0.24	\$5.84	\$27.82	\$8.34
Dresden	1,797	\$23.72	\$24.90	\$24.80	\$0.32	\$6.01	\$17.44	\$5.62
Hope Creek	1,172	\$23.08	\$24.42	\$24.36	\$0.43	\$6.01	\$17.44	\$5.62
LaSalle	2,271	\$23.11	\$24.26	\$24.16	\$0.18	\$6.01	\$17.44	\$5.62
Limerick	2,242	\$23.14	\$24.49	\$24.43	\$0.14	\$6.01	\$17.44	\$5.62
North Anna	1,892	\$26.69	\$28.00	\$27.88	\$0.17	\$6.01	\$17.44	\$5.62
Peach Bottom	2,347	\$22.38	\$23.67	\$23.61	\$0.28	\$6.01	\$17.44	\$5.62
Perry	1,240	\$26.43	\$27.77	\$27.66	\$0.24	\$5.84	\$27.82	\$8.34
Quad Cities	1,819	\$21.07	\$22.19	\$22.11	\$0.18	\$6.01	\$17.44	\$5.62
Salem	2,328	\$23.10	\$24.44	\$24.39	\$0.12	\$6.01	\$17.44	\$5.62
Surry	1,676	\$25.89	\$27.19	\$27.08	\$0.17	\$6.01	\$17.44	\$5.62
Susquehanna	2,520	\$21.48	\$22.51	\$22.41	\$0.28	\$6.01	\$17.44	\$5.62

Implied Net ACR for Nuclear Plants Including CapEx

	ICAP (MW)	Required Capacity Price to Break Even (\$/MW-Day)		
		2020	2021	2022
Beaver Valley	1,808	\$69.69	\$39.10	\$41.94
Braidwood	2,337	\$133.91	\$106.36	\$108.98
Byron	2,300	\$158.29	\$131.40	\$133.83
Calvert Cliffs	1,708	\$42.85	\$10.80	\$13.79
Davis Besse	894	\$382.12	\$351.30	\$353.94
Dresden	1,797	\$120.73	\$92.29	\$94.88
Hope Creek	1,172	\$133.47	\$101.37	\$102.72
LaSalle	2,271	\$138.60	\$111.06	\$113.60
Limerick	2,242	\$138.90	\$106.65	\$107.99
North Anna	1,892	\$53.07	\$21.66	\$24.66
Peach Bottom	2,347	\$153.72	\$122.76	\$124.16
Perry	1,240	\$367.76	\$335.74	\$338.40
Quad Cities	1,819	\$187.78	\$160.83	\$162.89
Salem	2,328	\$140.32	\$108.10	\$109.40
Surry	1,676	\$72.24	\$41.13	\$43.79
Susquehanna	2,520	\$175.36	\$150.58	\$153.02

Implied Net ACR for Nuclear Plants Excluding CapEx

	ICAP (MW)	Required Capacity Price to Break Even Excluding Capital (\$/MW-Day)		
		2020	2021	2022
Beaver Valley	1,808	\$0.00	\$0.00	\$0.00
Braidwood	2,337	\$0.00	\$0.00	\$0.00
Byron	2,300	\$23.41	\$0.00	\$0.00
Calvert Cliffs	1,708	\$0.00	\$0.00	\$0.00
Davis Besse	894	\$181.96	\$151.14	\$153.78
Dresden	1,797	\$0.00	\$0.00	\$0.00
Hope Creek	1,172	\$0.00	\$0.00	\$0.00
LaSalle	2,271	\$3.72	\$0.00	\$0.00
Limerick	2,242	\$4.02	\$0.00	\$0.00
North Anna	1,892	\$0.00	\$0.00	\$0.00
Peach Bottom	2,347	\$18.84	\$0.00	\$0.00
Perry	1,240	\$167.60	\$135.58	\$138.24
Quad Cities	1,819	\$52.90	\$25.95	\$28.01
Salem	2,328	\$5.44	\$0.00	\$0.00
Surry	1,676	\$0.00	\$0.00	\$0.00
Susquehanna	2,520	\$40.48	\$15.70	\$18.14

Summary

- **For 2022, the required capacity price to break even covering all NEI costs is under \$163/MW-day for multiple unit plants and over \$338/MW-day for single unit plants.**
- **For 2022, the required capacity price to break even covering NEI fuel and operating costs (excluding CapEx) is under \$29/MW-day for multiple unit plants and over \$138/MW-day for single unit plants.**
- **Plants may have actual operating costs higher or lower than the NEI average.**
- **Forward prices as of January 2, 2020.**

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