EE Education

MIC

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IMM

Monitoring Analytics

EE Revenues and EE Load Charges

- EE revenues
  - EE revenues are the revenues received by EE providers by the zone in which the EE measures are located.
  - EE revenues are costs to customers: EE costs.
- EE load charges
  - EE total load charges equal the EE total revenues (EE costs) paid by customers in all zones.
  - The allocation of EE revenues (EE costs) to customers by zone follows the allocation of capacity costs.
  - EE revenues (EE costs) are allocated to all customers in all zones, regardless of the location of the EE measures.

EE RPM Revenues by Zone

Zone	Revenue		Percent of EE Revenue	
	2023/2024	2024/2025	2023/2024	2024/2025
AECO	$2,099,556	$2,972,733	2.2%	2.5%
AEP	$8,220,965	$8,311,932	8.8%	6.9%
APS	$3,495,717	$4,013,640	3.7%	3.3%
ATSI	$5,621,390	$6,164,976	6.0%	5.1%
BGE	$6,954,765	$10,559,058	7.4%	8.8%
COMED	$11,102,489	$10,328,888	11.9%	8.6%
DAY	$1,280,027	$1,347,504	1.4%	1.1%
DEOK	$2,036,790	$6,482,315	2.2%	5.4%
DOM	$8,823,920	$9,388,297	9.4%	7.8%
DPL	$3,352,769	$5,305,356	3.6%	4.4%
DUQ	$1,543,017	$1,385,670	1.6%	1.2%
JCPL	$4,289,937	$6,579,743	4.6%	5.5%
METED	$2,127,988	$2,832,578	2.3%	2.4%
PECO	$9,970,022	$11,488,878	10.7%	9.6%
PENELEC	$1,847,587	$2,554,351	2.0%	2.1%
PEPCO	$5,287,930	$7,075,048	5.6%	5.9%
PPL	$5,447,923	$6,937,766	5.8%	5.8%
PSEG	$10,073,096	$16,076,315	10.8%	13.4%
RECO	$27,170	$64,182	0.0%	0.1%
Total	$93,603,058	$119,869,230	100.0%	100.0%

2024/2025 figures are prior to reposting of auction results

EE Addback Should Not Increase Clearing Prices

- **The result of the current EE addback method is that there is no impact on the capacity market clearing price, if done correctly and completely.**
- **Customers do pay for the cleared quantity of EE at market clearing prices as an uplift payment that provides a subsidy to EE sellers: EE load charges.**
- **EE load charges are not billed as a distinct line item but are included in the Locational Reliability Charges assessed to load.**

Load Charges in RPM

- **In accordance with the RAA, each LSE incurs a Locational Reliability Charge (subject to certain offsets and other adjustments as described in Attachment DD, Sections 5.14B through 5.14E and Section 5.15)**
- **Locational Reliability Charges are equal to the LSE's Daily Unforced Capacity Obligation in a Zone during the Delivery Year multiplied by the applicable Final Zonal Capacity Price in the Zone.**

Allocation of EE Revenues in RPM

- There are no Tariff references specific to the allocation of EE revenues (EE costs) in RPM.
- While EE should not affect the clearing price, by shifting the demand curve through the addback, and ultimately the capacity obligation of the zones, the EE costs are incurred by the load through the Locational Reliability Charge: EE load charges.
- Total EE costs are allocated to load prorata based on final zonal UCAP obligations:
  - Allocated EE costs = EE load charges to customers.

EE cost allocation – 2023/2024 Delivery Year

Zone	Final Zonal UCAP Obligation (MW)	Prorata allocation factor
AE	2,761.9	1.92%
AEP	13,401.7	9.30%
APS	10,262.1	7.12%
ATSI	13,943.0	9.67%
BGE	7,496.6	5.20%
COMED	22,694.3	15.74%
DAYTON	3,733.9	2.59%
DEOK	5,076.1	3.52%
DLCO	3,169.7	2.20%
DOM	3,869.1	2.68%
DPL	4,375.0	3.04%
EKPC	2,674.6	1.86%
JCPL	6,847.0	4.75%
METED	3,510.1	2.44%
OVEC	72.2	0.05%
PECO	9,667.9	6.71%
PENLC	3,302.0	2.29%
PEPCO	7,091.2	4.92%
PL	8,498.6	5.90%
PS	11,229.2	7.79%
RECO	466.7	0.32%
Total	144,142.8	100.00%

Load charges for EE

2023/2024				
Zone	LDA	EE Load Charge	EE Revenue	EE Load Charge minus Revenue
AE	EMAAC	$1,793,515	$2,099,556	-$306,041
AEP	RTO	$8,702,767	$8,220,965	$481,802
APS	RTO	$6,663,971	$3,495,717	$3,168,254
ATSI	ATSI	$9,054,283	$5,621,390	$3,432,894
BGE	BGE	$4,868,113	$6,954,765	-$2,086,652
COMED	COMED	$14,737,133	$11,102,489	$3,634,644
DAYTON	DAY	$2,424,683	$1,280,027	$1,144,656
DEOK	DEOK	$3,296,287	$2,036,790	$1,259,497
DLCO	RTO	$2,058,324	$1,543,017	$515,307
DOM	RTO	$2,512,484	$8,823,920	-$6,311,436
DPL	EMAAC	$2,841,034	$3,352,769	-$511,735
EKPC	RTO	$1,736,804	$0	$1,736,804
JCPL	EMAAC	$4,446,293	$4,289,937	$156,356
METED	MAAC	$2,279,389	$2,127,988	$151,401
OVEC	RTO	$46,869	$0	$46,869
PECO	EMAAC	$6,278,084	$9,970,022	-$3,691,938
PENLC	MAAC	$2,144,251	$1,847,587	$296,663
PEPCO	PEPCO	$4,604,866	$5,287,930	-$683,064
PL	PPL	$5,518,809	$5,447,923	$70,886
PS	PSEG	$7,292,014	$10,073,096	-$2,781,082
RECO	EMAAC	$303,085	$27,170	$275,915
Total		$93,603,058	$93,603,058	$0

Where zonal EE load charges are greater than zonal EE revenues (EE costs), those excess load charges subsidize EE costs in other zones.

If the load charge less the revenue is negative, the zone receives a subsidy.

If the load charge less the revenue is positive, the zone pays a subsidy.

Impact of EE Addback

- Capacity Market Clearing with EE offers in the supply and EE Addback and Market Clearing without EE offers in the supply should be identical
- Starting with the 2023/2024 Base Residual Auction, the EE addback MW is iteratively adjusted until the difference between the EE addback and EE cleared is zero for all LDAs or as close to zero as possible
- These changes minimized the impact of EE on the market outcomes but did not eliminate the impact of EE on the capacity market as a result of the treatment of seasonal capacity matching.

Seasonal EE Affects Clearing of Other Resources

- The primary reason for these differences is the participation of Seasonal EE in the capacity auction
- Seasonal EE is matched with opposite Seasonal generation and demand resources in the market clearing
- Cleared Seasonal EE UCAP MW is added back to the VRR curve, but treated as if it were cleared Annual EE UCAP MW
- A Seasonal EE MW is equivalent to 50 percent of an Annual EE MW

BRA Results With and Without EE

- Base Case results show the BRA prices and quantities with EE included in the capacity market process, and with EE addback, but without EE MW in the clearing.
- Scenario 1 results show the BRA prices and quantities with EE entirely removed from the capacity market process.
- Difference columns show the impact of EE on clearing prices and clearing quantities of capacity resources:
  - 17.5 MW of summer capacity resources that would clear without EE (Scenario 1), did not clear with EE included
  - 361.5 MW of winter seasonal capacity cleared with EE but would not clear without EE
- EE affected the quantity of capacity that cleared.

BRA Results With EE (Base Case)

- BRA included EE: Base case shows results excluding EE MW but with impact.
- In the BRA, 139,583.6 UCAP MW of Annual non EE, 226.6 UCAP MW of Summer non EE and 605.6 UCAP MW of Winter non EE capacity cleared.
- EE excluded in the Base Case:
  - EE that did not clear but was paid
  - EE that did clear when matched with winter seasonal capacity (361.5 MW)
- The total cleared non EE capacity in annual equivalent UCAP MW was 139,999.7 UCAP MW (139,583.6 + 0.5*226.6 + 0.5*605.6)

BRA Results Without EE (Scenario 1)

- **If EE were entirely removed (Scenario 1), 139,566.5 UCAP MW of Annual, 244.1 UCAP MW of Summer and 244.1 MW of Winter capacity would clear.**
- **The total cleared capacity in annual equivalent UCAP MW would be 139,810.6 UCAP MW (139,566.5 + 0.5*244.1 + 0.5*244.1)**

Difference between Base Case and Scenario 1

- 17.1 MW of additional annual capacity would not clear if EE excluded.
- 17.5 MW of additional summer capacity would clear if EE excluded
- 361.5 MW of matched winter capacity would not clear if EE excluded.
- In total, 189.1 MW (17.1+0.5*(-17.5)+0.5*361.5) annual equivalent capacity would not clear if EE excluded.
- There is a small difference in clearing prices.
  - EE can have an impact on prices also, despite addback mechanism.

Impact of EE on 2024/2025 Base Residual Auction

		Base Case (Excluding EE MW)		Scenario 1 (No EE and No EE Addback)		Difference	
LDA	Product Type	Clearing Prices ($ per MW-day)	Cleared UCAP MW	Clearing Prices ($ per MW-day)	Cleared UCAP MW	Clearing Prices ($ per MW-day)	Cleared UCAP MW
RTO	Annual	$28.92	139,583.6	$28.91	139,566.5	$0.01	17.1
	Summer	$28.92	226.6	$28.91	244.1	$0.01	(17.5)
	Winter	$28.92	605.6	$28.91	244.1	$0.01	361.5
RTO Total (Annual Equivalent)			139,999.7		139,810.6		189.1
MAAC	Annual	$49.49	60,802.6	$49.13	60,794.2	$0.36	8.4
	Summer	$49.49	14.1	$49.13	18.2	$0.36	(4.1)
	Winter	$49.49	52.7	$49.13	18.2	$0.36	34.5
MAAC Total (Annual Equivalent)			60,836.0		60,812.4		23.6
EMAAC	Annual	$53.60	28,774.3	$53.60	28,774.3	$0.00	0.0
	Summer	$53.60	0.0	$53.60	0.0	$0.00	0.0
	Winter	$53.60	0.0	$53.60	0.0	$0.00	0.0
EMAAC Total (Annual Equivalent)			28,774.3		28,774.3		0.0
DPL South	Annual	$426.17	1,320.3	$426.17	1,348.7	$0.00	(28.4)
	Summer	$426.17	0.0	$426.17	0.0	$0.00	0.0
	Winter	$426.17	0.0	$426.17	0.0	$0.00	0.0
DPL South Total (Annual Equivalent)			1,320.3		1,348.7		(28.4)
BGE	Annual	$73.00	2,293.0	$73.00	2,293.0	$0.00	0.0
	Summer	$73.00	0.0	$73.00	0.0	$0.00	0.0
	Winter	$73.00	0.0	$73.00	0.0	$0.00	0.0
BGE Total (Annual Equivalent)			2,293.0		2,293.0		0.0
DEOK	Annual	$96.24	1,876.1	$96.24	1,876.1	$0.00	0.0
	Summer	$96.24	0.0	$96.24	0.0	$0.00	0.0
	Winter	$96.24	0.0	$96.24	0.0	$0.00	0.0
DEOK Total (Annual Equivalent)			1,876.1		1,876.1		0.0

Payment to Energy Efficiency

- **The EE cleared in the 23/24 BRA was 5,346.1 Annual Equivalent UCAP MW**
  - **The weighted average clearing price was $41.53/MW-day.**
  - **EE resources were paid $81.3M in the 23/24 BRA.**
- **The EE cleared in the Revised 24/25 BRA is 7,477.7 Annual Equivalent UCAP MW**
  - **The weighted average EE clearing price was $47.06/MW-day.**
  - **EE resources will be paid $128.4 M with the revised 24/25 BRA.**

Payment to Energy Efficiency

- EE revenues depend on BRA clearing prices.
- If the BRA clearing price declines, EE revenues will decline.
- If the BRA clearing price increases, EE revenues will increase.
- Potential changes in EE revenues
  - With same cleared MW
  - A range of BRA clearing prices
- If the EE capacity market clearing price is $150 per MW-day, payments to EE will increase to more than $400M in the next capacity base auction (BRA).

Potential Payment to Energy Efficiency Vary by Clearing Prices

Energy Efficiency Cleared in the 2024/2025 Base Residual Auction (Annual Equivalent UCAP MW)	Potential EE Weighted Average Clearing Price in 2025/2026 BRA ($/MW-day)	Total Potential Payment to EE ($/DY)
7,477.7	$25.00	$68,234,013
7,477.7	$75.00	$204,702,038
7,477.7	$100.00	$272,936,050
7,477.7	$125.00	$341,170,063
7,477.7	$150.00	$409,404,075

Recommendation

- **In the next BRA, for the 25/26 delivery year, the impact of EE should be eliminated entirely from the market clearing, as intended.**
- **Summer EE should not be allowed to pair with winter resources to clear as capacity resources.**
- **There can be an impact on clearing prices and quantities.**
- **This complete and accurate addback can be accomplished by eliminating EE from the auction clearing and paying all qualifying EE the clearing price, after the auction clears.**

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