Proposed Changes for Methodology used to Determine LDA Net CONE Values

Capacity Senior Task Force

June 13, 2014

Current Method used to Determine RTO and LDA Net CONE Values

- Sections 5.10(a)(iv) & (v) of Attachment DD describe current method used to determine the Gross CONE, Net EAS offset and the Net CONE for the PJM RTO Region and each modeled LDA
- Current approach is illustrated on the following slides 3 thru 8 using the modeled LDAs and planning parameters of the 2017/18 BRA

CONE Area Definitions of Attachment DD, Section 5.10(a)(iv)

	Zones	Current Gross CONE ($/MW-Yr) in 2017/18 dollars
CONE Area 1 *EMAAC Zones*	AE DPL JCPL PECO PS RECO	156,881
CONE Area 2 *SWMAAC Zones*	BGE PEPCO	146,348
CONE Area 3 *Rest of RTO Zones*	AEP Dayton ComEd APS DQL ATSI DEOK EKPC	143,670
CONE Area 4 *WMAAC Zones*	PPL MetEd Penelec	150,718
CONE Area 5	Dominion	128,542
PJM Region	N/A	143,434

- A Gross CONE Value is specified for each of 5 CONE Areas and the PJM Region
- Each zone is assigned to a CONE Area
- The CONE for each LDA is determined based on the zones that comprise the LDA
- If an LDA combines zones with differing CONE values, the lowest such value is used

Net EAS For CONE Area
Attachment DD, Section 5.10(a)(v)

	Zones	Zonal LMPs used for Net EAS
CONE Area 1 *EMAAC Zones*	AE DPL JCPL PECO PS RECO	**AE**
CONE Area 2 *SWMAAC Zones*	BGE PEPCO	**BGE**
CONE Area 3 *Rest of RTO Zones*	AEP Dayton ComEd APS DQL ATSI DEOK EKPC	**ComEd**
CONE Area 4 *WMAAC Zones*	PPL MetEd Penelec	**MetEd**
CONE Area 5	Dominion	**Dominion**
PJM Region	N/A	**PJM Average**

- Net EAS of the PJM Region and each CONE Area is determined as annual average net revenues from energy market for the reference resource during prior three-year calendar period
- For PJM Region Net EAS, the Reference Resource is "dispatched" against actual PJM hourly average LMPs
- For Net EAS of each CONE Area, Reference Resource is “dispatched” against actual hourly LMPs for zone in which Reference Resource was assumed to be installed for purposes of CONE estimate (table at left shows zones used to determine Net EAS for each CONE Area)

Application of 5.10(a)(iv) & (v) in Determination of LDA Net CONE Values

	Zones	Gross CONE ($/MW-Yr)	Net EAS ($/MW-Yr)	Net CONE ($/MW-Yr)	Net CONE ($/MW-Day)
CONE Area 1 *EMAAC Zones*	AE DPL JCPL PECO PS RECO	156,881	30,885 (AE Zone)	125,996	345
CONE Area 2 *SWMAAC Zones*	BGE PEPCO	146,348	38,559 (BGE Zone)	107,789	295
CONE Area 3 *Rest of RTO Zones*	AEP Dayton ComEd APS DQL ATSI DEOK EKPC	143,670	14,960 (ComEd Zone)	128,710	353
CONE Area 4 *WMAAC Zones*	PPL MetEd Penelec	150,718	28,651 (MetEd Zone)	122,067	334
CONE Area 5	Dominion	128,542	28,691 (Dom Zone)	99,851	274
PJM Region	N/A	143,434	22,423 (PJM Avg LMP)	121,011	332

LDAs Modeled in 17/18 BRA	Applicable CONE Area	Zonal LMP used in Net EAS Determination
RTO	PJM Region CONE	PJM
MAAC	CONE Area 2 (lower of CONE Area 1, 2 or 4)	BGE
EMAAC	CONE Area 1	AECO
SWMAAC	CONE Area 2	BGE
PSEG	CONE Area 1	AECO
PS-North	CONE Area 1	AECO
DPL-South	CONE Area 1	AECO
ATSI	CONE Area 3	ComED
Cleveland	CONE Area 3	ComED
ComEd	CONE Area 3	ComED
PPL	CONE Area 4	Met-Ed
BGE	CONE Area 2	BGE
PEPCO	CONE Area 2	BGE

Application of 5.10(a)(iv) & (v) in Determination of LDA Net CONE Values (cont.)

- Using 17/18 BRA LDAs as example, LDA Net CONE values are determined based on the CONE Area and Net EAS mapping shown to left
- For LDAs that comprise multiple zones, current method uses Net EAS based on average hourly LMP of a single zone
- For zonal or sub-zonal LDAs, current method uses Net EAS based on average hourly LMP of a single zone that may differ from the LDA zone

LDAs Modeled in 17/18 BRA	Gross CONE ($/MW-YR)	Net EAS ($/MW-YR)	Net CONE ($/MW-Day)
RTO	$143,434 (PJM Region CONE)	$22,423 (PJM AVG LMP)	$332
MAAC	$146,348 (CONE Areas 1, 2 or 4)	$38,559 (BGE Zone)	$295
EMAAC	$156,881 (CONE Area 1)	$30,885 (AE Zone)	$345
SWMAAC	$146,348 (CONE Area 2)	$38,559 (BGE Zone)	$295
PSEG	$156,881 (CONE Area 1)	$30,885 (AE Zone)	$345
PS-North	$156,881 (CONE Area 1)	$30,885 (AE Zone)	$345
DPL-South	$156,881 (CONE Area 1)	$30,885 (AE Zone)	$345
ATSI	$143,670 (CONE Area 3)	$14,960 (ComEd Zone)	$353
Cleveland	$143,670 (CONE Area 3)	$14,960 (ComEd Zone)	$353
ComEd	$143,670 (CONE Area 3)	$14,960 (ComEd Zone)	$353
PPL	$150,718 (CONE Area 4)	$28,651 (MetEd Zone)	$334
BGE	$146,348 (CONE Area 2)	$38,559 (BGE Zone)	$295
PEPCO	$146,348 (CONE Area 2)	$38,559 (BGE Zone)	$295

- Table at left shows Net CONE values and basis for Net CONE values for RTO and each LDA modeled in the 2017/18 BRA using current methodology of Net CONE determination

Negative Aspects of Current Method of Determination of LDA Net CONE Values

- Net CONE values of larger LDAs that comprise multiple zones based on a Net EAS offset determined using actual hourly LMP of a single zone within that LDA
- Net CONE values of zonal or sub-zonal LDAs may be based on a Net EAS offset determined using actual hourly LMP of a zone that differs from the LDA zone
- Net CONE of constrained LDAs may be lower than Net CONE of parent LDA resulting in down-shift of LDA VRR curve relative to parent VRR curve
  - Weakens the capacity market price signals for constrained LDAs by offsetting the locational investments signals created by EAS prices
  - an over-estimated Net EAS of the constrained LDA can translate to disproportionate under-procurement and reliability consequence for the constrained LDA

Recommended Change to Method used to Determine LDA Net CONE Values

1. Calculate a Net CONE for each zone using the Gross CONE of the CONE area to which the zone is assigned minus the Net EAS of the zone as determined by "dispatch" of the Reference Resource against the actual hourly LMPs for that zone
2. Set the Net CONE of each zonal and sub-zonal LDA to the applicable zonal Net CONE; and set the Net CONE of LDAs that comprise more than one zone to the average of the zonal Net CONE values of all zones in the LDA
3. If the Net CONE of an LDA is lower than the Net CONE of the immediately-higher parent LDA then substitute with the Net CONE of the Parent LDA

Recommended method is illustrated on the following slides 10 thru 14 using the modeled LDAs and planning parameters of the 2017/18 BRA

Calculate Net CONE for each Zone

	Gross CONE ($/MW-Yr)	Zonal Net EAS ($/MW-Yr)		Net CONE ($/MW-Yr)	Net CONE ($/MW-Day)
CONE Area 1 *EMAAC Zones*	$156,881	RECO	$26,282	$130,599	$358
		PS	$27,440	$129,441	$355
		PECO	$30,337	$126,544	$347
		AE	$30,885	$125,996	$345
		JCPL	$31,206	$125,675	$344
		DPL	$34,345	$122,536	$336
	AVERAGE EMAAC Zones		***$30,082***	**$126,799**	**$347**
CONE Area 2 SWMAAC Zones	$146,348	PEPCO	$35,390	$110,958	$304
		BGE	$38,559	$107,789	$295
	AVERAGE SWMAAC Zones		***$36,974***	**$109,374**	**$300**
CONE Area 4 *WMAAC Zones*	$150,718	PPL	$27,824	$122,894	$337
		Penelec	$28,000	$122,718	$336
		MetEd	$28,651	$122,067	$334
	AVERAGE WMAAC Zones		***$28,158***	**$122,560**	**$336**
	AVERAGE of All MAAC Zones			**$122,474**	**$336**

Calculate Net CONE for each Zone (cont.)

	Gross CONE ($/MW-Yr)	Zonal Net EAS ($/MW-Yr)		Net CONE ($/MW-Yr)	Net CONE ($/MW-Day)
CONE Area 3 *Rest of RTO Zones*	$143,670	ComEd	$14,960	$128,710	$353
		AEP	$18,837	$124,833	$342
		Dayton	$19,784	$123,886	$339
		DQL	$21,565	$122,105	$335
		APS	$25,179	$118,491	$325
		ATSI	$21,613	$122,057	$334
		DEOK	*		
		EKPC	*		
CONE Area 5 *DOM Zone*	$128,542	Dom	$28,691	$99,851	$274
RTO Region	$143,434	PJM Avg LMP	$22,423	$121,011	$332

* Not available for full 3-year period

LDAs Modeled in 17/18 BRA	Gross CONE ($/MW-YR)	Net EAS ($/MW-YR)	Direct Net CONE ($/MW-Day)	Net CONE after Reset ($/MW-Day)
RTO	$143,434 (PJM Region CONE)	$22,423 (PJM AVG LMP)	$332	$332
MAAC	Use Average Net CONE of All MAAC Zones		$336	$336
EMAAC	Use Average Net CONE of All EMAAC Zones		$347	$347
SWMAAC	Use Average Net CONE of All SWMAAC Zones		$300	336 (Reset to MAAC)
PSEG	$156,881 (CONE Area 1)	$27,439 (PSEG Zone)	$355	$355
PS-North	$156,881 (CONE Area 1)	$27,439 (PSEG Zone)	$355	$355
DPL-South	$156,881 (CONE Area 1)	$34,345 (DPL Zone)	$336	$347 (Reset to EMAAC)
ATSI	$143,670 (CONE Area 3)	$21,613 (ATSI Zone)	$334	$334
Cleveland	$143,670 (CONE Area 3)	$21,613 (ATSI Zone)	$334	$334
ComEd	$143,670 (CONE Area 3)	$14,960 (ComEd Zone)	$353	$353
PPL	$150,718 (CONE Area 4)	$27,824 (PPL Zone)	$337	$337
BGE	$146,348 (CONE Area 2)	$38,559 (BGE Zone)	$295	$336 (Reset to MAAC)
PEPCO	$146,348 (CONE Area 2)	$35,390 (PEPCO Zone)	$304	$336 (Reset to MAAC)

Proposed Method for Determination of LDA Net CONE Values

- Table at left shows Net CONE values and basis for Net CONE values for RTO and each LDA modeled in the 2017/18 BRA using proposed method of Net CONE determination
- for LDAs that comprise multiple zones, the Net CONE is based on average Net CONE of all zones within the LDA
- for zonal or sub-zonal LDAs, the Net CONE is based on Net CONE of that zone
- Compare to values and basis for values of current method of slide 7

2017/18 Net CONE Values
Current Method versus Proposed Method

	Net CONE ($/MW-Day)	
LDAs Modeled in 17/18 BRA	Current Method	Proposed Method
RTO	$332	$332
MAAC	$295	$336
EMAAC	$345	$347
SWMAAC	$295	$336
PSEG	$345	$355
PS-North	$345	$355
DPL-South	$345	$347
ATSI	$353	$334
Cleveland	$353	$334
ComEd	$353	$353
PPL	$334	$337
BGE	$295	$336
PEPCO	$295	$336

Benefits of Proposed Method versus Current Method

- Net CONE values of larger LDAs that comprise multiple zones based on a Net EAS determined for all zones within that LDA – more representative of the larger region
- Net CONE values of zonal or sub-zonal LDAs based on Net EAS determined for that zone – more representative of that smaller region
- Substitution of LDA Net CONE with parent Net CONE (when parent Net CONE is greater) maintains strong capacity market investment signals in constrained LDA and mitigates locational reliability consequences of over-estimating LDA Net EAS

Other PJM Recommendations related to Gross CONE/Net EAS Mapping

- Eliminate CONE Area 5 and move Dominion Zone into CONE Area 3 for purposes of assignment of Gross CONE values
  - Under PJM's proposed change to LDA Net CONE determination method, a Zonal LDA Net CONE is based on that Zone's Net EAS (not true under current method); this change eliminates the initial justification and need for a separate CONE Area 5.
  - A separate gross CONE estimation for CONE Area 5 is especially unnecessary considering the small difference in gross CONE value of CONE Area 5 relative to the other CONE Areas
- Set the PJM Region gross CONE value equal to the average Gross CONE of the remaining four CONE Areas
  - Current PJM Region gross CONE value is result of settlement; a mechanical approach which would allow for automatic update with each quadrennial review is preferred approach

Current and Updated Gross CONE Values

	Zones	Current Gross CONE ($/MW-Yr) in 2015/16 dollars	Current Gross CONE ($/MW-Yr) in 2018/19 dollars	Updated Gross CONE ($/MW-Yr) in 2018/19 dollars
CONE Area 1 *EMAAC Zones*	AE DPL JCPL PECO PS RECO	140,000	161,588	150,000
CONE Area 2 *SWMAAC Zones*	BGE PEPCO	130,600	150,738	148,400
CONE Area 3 *Rest of RTO Zones*	AEP Dayton ComEd APS DQL ATSI DEOK EKPC	127,500	147,980	147,500
CONE Area 4 *WMAAC Zones*	PPL MetEd Penelec	134,500	155,240	143,500
CONE Area 5	Dominion	114,500	132,398	141,200
PJM Region	N/A	128,000	147,737	N/A

(1) current CONE values based on level-nominal calculation for GE Frame 7FA CT with SCR in Areas 1 thru 4 and dual fuel capability in all 5 Areas

(2) updated CONE values above based on level-nominal calculation for GE Frame 7FA CT with SCR in all 5 Areas and dual fuel capability in all 5 Areas

PJM Recommendations: PJM Region CONE & Elimination of CONE Area 5

	Zones	Updated Gross CONE ($/MW-Yr) in 2018/19 dollars	PJM Recommendations Gross CONE ($/MW-Yr) in 2018/19 dollars
CONE Area 1 *EMAAC Zones*	AE DPL JCPL PECO PS RECO	150,000	150,000
CONE Area 2 *SWMAAC Zones*	BGE PEPCO	148,400	148,400
CONE Area 3 *Rest of RTO Zones*	AEP Dayton ComEd APS DQL ATSI DEOK EKPC Dominion	147,500	147,500
CONE Area 4 *WMAAC Zones*	PPL MetEd Penelec	143,500	143,500
~~**CONE Area 5**~~	~~**Dominion**~~	~~**141,200**~~	~~**141,200**~~
PJM Region	N/A	N/A	**147,350 (Average of CONE Areas 1 thru 4)**