ARR/FTR Data Update and IMM Package Proposal

AFMTF

July 13, 2021

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IMM Proposal: Replace Fixed Path Right with Congestion Revenue Right

- **Simplify the mechanism to return congestion to the load.**

- **Load simply has the right to collect all (100 percent) of the congestion paid by that load in every hour of the year, from both the day ahead and real time (balancing) market.**

- **If the load does nothing, load will receive all the congestion paid every billing period during the entire planning year.**

- **Eliminate fixed source and sink point assignments and the election of specific source and sink points by the load.**

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IMM Proposal: Replace Fixed Path Right with Congestion Revenue Right

- **Actual congestion revenue includes both day-ahead and balancing congestion.**

- **Congestion is the difference between what load pays for energy and what generation is paid for energy after virtual bids are settled.**

- **Load's right to actual congestion is defined to be a Congestion Revenue Right (CRR)**

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ARR and FTR Total Congestion Offset for ARR Holders: 2011/2012 through 2020/2021 ($M)

Planning Period	ARR Credits	Unadjusted FTR Credits	Day Ahead Congestion	Balancing + M2M Congestion	Total Congestion	Surplus Revenue Pre 2017/2018 Rules (Balancing in FTR Fund, Surplus goes to FTRs)	Surplus Revenue 2017/2018 Rules (Load Pays Balancing and Surplus goes to FTRs)	Post 2017/2018 Rules (Load Pays Balancing, Surplus Goes to ARRs)	Pre 2017/2018 (Without Balancing) Total ARR/FTR Offset	Percent Offset	2017/2018 (With Balancing) Current Revenue Received	Percent Offset	Post 2017/2018 (With Balancing and Surplus) New Revenue Received	New Offset
2011/2012	$512.2	$310.0	$1,025.4	($275.7)	$749.7	($50.6)	$35.6	$113.9	$771.6	102.9%	$582.1	77.6%	$660.4	88.1%
2012/2013	$349.5	$268.4	$904.7	($379.9)	$524.8	($94.0)	$18.4	$62.1	$523.9	99.8%	$256.4	48.9%	$300.1	57.2%
2013/2014	$337.7	$626.6	$2,231.3	($360.6)	$1,870.6	($139.4)	($49.0)	($49.0)	$824.8	44.1%	$554.6	29.7%	$554.6	29.7%
2014/2015	$482.4	$348.1	$1,625.9	($268.3)	$1,357.6	$36.7	$111.2	$400.6	$867.2	63.9%	$673.4	49.6%	$962.8	70.9%
2015/2016	$635.3	$209.2	$1,098.7	($147.6)	$951.1	$9.2	$42.1	$188.9	$853.7	89.8%	$739.0	77.7%	$885.9	93.1%
2016/2017	$640.0	$149.9	$885.7	($104.8)	$780.8	$15.1	$36.5	$179.0	$805.0	103.1%	$721.6	92.4%	$864.0	110.7%
2017/2018	$427.3	$212.3	$1,322.1	($129.5)	$1,192.6	$52.3	$80.4	$370.7	$692.0	58.0%	$590.6	49.5%	$880.9	73.9%
2018/2019	$529.1	$130.1	$832.7	($152.6)	$680.0	($5.8)	$16.2	$112.2	$653.3	96.1%	$522.7	76.9%	$618.8	91.0%
2019/2020	$542.0	$91.9	$612.1	($169.4)	$442.7	($1.6)	$21.6	$157.8	$632.3	142.8%	$486.1	109.8%	$622.2	140.6%
2020/2021*	$373.9	$179.3	$899.6	($256.2)	$643.4	($43.1)	($0.0)	($0.0)	$ 510.14	79.3%	$297.1	46.2%	$297.1	46.2%
Total	$4,829.4	$2,525.8	$11,438.0	($2,244.7)	$9,193.4	($221.2)	$312.9	$1,536.1	$7,134.1	77.6%	$5,423.6	59.0%	$6,646.8	72.3%

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IMM Proposal: Replace Fixed Path Right with Congestion Revenue Right

- **Each LSE has the option to collect or sell the monthly congestion revenues to which it has rights, by bus.**
  - **DA + Balancing**
  - **Congestion can never have a negative value**
  - **Default option is the return of congestion paid to the load that paid it**
  - **Return of congestion would occur in every billing cycle throughout the planning year**

IMM Proposal: Replace Fixed Path Right with Congestion Revenue Right

- **Each LSE would have control of what is sold and the price at which it is sold**
  - **Each LSE can sell zero to 100 percent of its own congestion revenue rights by bus or zone.**
  - **Reserve prices set by LSE**
- **Each LSE will be provided information about congestion paid**
  - **By constraint**
  - **By period, by month, by hour**
  - **DA and RT**
  - **By planning year**

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IMM Proposal: Replace Fixed Path Right with Congestion Revenue Right

- **Each LSE has the option to sell its congestion revenue rights**
  - **Auction (PJM or third party platform)**
  - **Bilateral (tracked by PJM)**
  - **Risk limited to the selling LSE**
  - **No cross subsidies among rights holders**

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IMM Proposal: Replace Fixed Path Right with Congestion Revenue Right

- **Certainty about return of all actual congestion paid**

- **No hold back of system capability to guarantee FTR funding**

- **No end of year surplus allocation needed**
  - **No surplus exists if all congestion revenue rights are allocated**

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IMM Proposal: Replace Fixed Path Right with Congestion Revenue Right

- **If all or a portion of the Congestion Revenue Right was sold and load moves from one LSE to another LSE:**

  - **Congestion Revenue Right (CRR) is the right to all the congestion paid (day ahead and balancing) by the associated load.**

  - **The auction price (revenue from the sale of the CRR) from any CRR sold moves with the load.**

  - **The congestion revenue rights of any unsold CRR move with the load.**

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IMM Proposal: Replace Fixed Path Right with Congestion Revenue Right

- **No cross subsidies among LSEs**
  - **All congestion collected by bus**
- **Return of actual congestion paid means:**
  - **Rights to congestion are always positive in value to the recipient**
  - **No flip of path value (cannot go from positive to negative)**
  - **No cross subsidies caused by path specific approach and binary outage modeling or primary rights.**

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IMM Proposal: Replace Fixed Path Right with Congestion Revenue Right

- **Elimination of path based system eliminates risk inherent in current design:**
  - **No paths: No cross subsidies among rights**
  - **Bankruptcy of a buyer does not affect congestion revenues or other sellers of congestion rights**
  - **If a buyer is bankrupt, congestion rights revert to owner**
    - Owner loses only revenue stream from buyer
    - Owner can resell congestion revenue rights
    - No effect on other positions
    - No tax on membership to support remaining FTR holders

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IMM Package/Proposal Matrix

#	Design Components	Priority	Status Quo	IMM Package
1	Availability and Assignment of Congestion rights to Load		Stage 1 – source points only from designated active historical resources or Qualified Replacement Resources Stage 2 – source points any available generator, interface, hub, zone Must always sink at load settlement point/aggregate	Rights to all congestion allocated to the load that paid it, based on actual network congestion DA and RT
2	Product Definition		24 H product for entire year	Rights to all congestion allocated to the load that paid it, based on actual network congestion DA and RT
3	Allocation mechanism			Rights to all congestion allocated to the load that paid it, based on actual network congestion DA and RT
4	Allocation Frequency		Once a year nomination	Every billing period.
5	ARR nomination point availability			Automatic load specific nomination of physical load points/export interface
6	Congestion Right Election (Claim or Sell Options)		Annual, 24H Obligation "Price taker" from average 4 round annual auction prices	Default and automatic election is to receive back all congestion paid by load to the load that paid it. Load has the option to set reserve prices for the sale of any portion of congestion that will be paid in a given period.

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IMM Package Matrix

#	Design Components	Priority	Status Quo	IMM Package
7	Auction Surplus		Auction surplus goes to FTR deficiencies first, residual allocated to ARR holders on ARR weighted basis	NA, All rights are assigned, no unassigned rights
8	Congestion Surplus		Congestion surplus goes to FTR deficiencies first, residual allocated to ARR holders on ARR weighted basis	NA, All rights are assigned, no unassigned rights
9	Model details		Annual Model with modeled constraints, line limits and outages based on DA snap shot, Monthly updates during planning year. Objective to guarantee target allocation payouts.	Actual DA model and RT model of every actual market day
10	Amount of guaranteed ARRs		Stage 1A up-to ZBL share on historical source and sink paths only.	100 percent of the congestion collected is paid back to the load that paid in every billing period over the planning year. Load has the option to sell all or a portion of the congestion collected.
11	Incremental ARR product types		EE, Merchant, RTEP	Eliminate IARR going forward, inconsistent with network use. Existing rights can be grandfathered.

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IMM Package Matrix

#	Design Components	Priority	Status Quo	IMM Package
11	Incremental ARR product types		EE, Merchant, RTEP	Eliminate IARR going forward, inconsistent with network use. Existing rights can be grandfathered.
12	IARR model development and SFT assumptions and procedures		Model document available here: https://www.pjm.com/-/media/markets-ops/ftr/pjm-iarr-model-development-and-analysis.ashx	Eliminate IARR going forward, inconsistent with network use. Existing rights can be grandfathered.
13	FTR Auction bid limits		10,000 per period, auction, round by corporate entity	Depends on auction design
14	FTR Option paths and clearing mechanism		Path availability limited by historical pricing and source/sink pnode type. Price calculated for all eligible Option paths.	All rights are options, no negative values possible
15	Invalid FTR Paths		FTR paths that clear with < 0.1% impact on any constraint not cleared. FTRs with a zero clearing price will only be awarded if there is a minimum of one binding constraint in the auction period for which the FTR path sensitivity is non-zero (0.1% threshold).	NA

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IMM Package Matrix

#	Design Components	Priority	Status Quo	IMM Package
16	FTR product & class types		- 24H, On peak, Off peak (M-F 2300-0700, Weekend all day). Monthly or Annual product.	Product types for congestion made available to market would match what was sold by rights holders (load). Product types can be as flexible as requested by the market.
17	Bilateral transaction functionality		Post, Accept, Confirm. Indemnification from defaults	All bilateral arrangements must be on a PJM platform subject to PJM credit criteria
18	Source of Congestion dollars allocated to FTRs		DA ahead only, balancing and M2M assigned to load on load ratio basis.	All congestion (DA + Balancing +M2M)
19	Available Rights not allocated or directly claimable by load (FTR Biddable points)		Paths not associated with ARR source and sink pairs (sets)	All rights to all congestion are allocated to load
20	FTR Forfeiture Rule		Flow based, per M-6 section 8.6	NA

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IMM Package Matrix

#	Design Components	Priority	Status Quo	IMM Package
21	Network model posted information		Base topology, outages, selected interface limits, m2m flow, loop flow, uncompensated flow, contingencies modeled	Actual DA model and RT model of every actual market day, subject to security concerns. OASIS
22	Network model posting frequency		Base models posted quarterly; outages, interface limits posted per auction, aggregate and PAR definitions, model mapping files	Actual DA model and RT model of every actual market day, subject to security concerns. OASIS
23	Outage modeling		Binary outages, entire model period	Actual by day
24	Bid submission upload capability		Bids can be submitted through FTR center, or browserless via XML.	Depends on auction design
25	Implementation date		N/A	6/1/2022

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Zonal ARR and FTR Total Congestion Offset for ARR Holders: 2020/2021 Planning Period($M)

Zone	ARR Credits	Adjusted FTR Credits	Balancing+ M2M Charge	Surplus Allocation	Total Offset	Day Ahead Congestion	Balancing Congestion	M2M Payments	Total Congestion	Offset
ACEC	$4.4	$0.0	($2.7)	($0.1)	$1.7	$8.2	($2.3)	($0.5)	$5.5	31.2%
AEP	$40.2	$36.4	($38.1)	($2.4)	$38.4	$149.0	($32.2)	($5.9)	$110.9	34.6%
APS	$32.9	$14.9	($14.8)	($1.4)	$33.0	$60.0	($12.5)	($2.3)	$45.2	73.0%
ATSI	$20.4	$0.2	($19.5)	($0.6)	$1.1	$70.1	($16.4)	($3.0)	$50.6	2.1%
BGE	$58.4	$3.6	($9.1)	($1.7)	$52.8	$34.0	($7.7)	($1.4)	$24.8	212.7%
COMED	$36.4	$11.5	($28.5)	($1.2)	$19.4	$106.8	($24.2)	($4.4)	$78.3	24.7%
DAY	$5.9	$0.8	($5.3)	($0.2)	$1.5	$16.3	($4.5)	($0.8)	$11.0	13.4%
DUKE	$24.2	$4.9	($8.4)	($0.8)	$20.8	$25.8	($7.1)	($1.2)	$17.4	119.5%
DUQ	$5.6	$0.2	($4.0)	($0.2)	$1.8	$10.4	($3.4)	($0.9)	$6.2	29.6%
DOM	$7.7	$85.7	($37.9)	($1.9)	$55.5	$121.5	($32.9)	($0.6)	$87.9	63.1%
DPL	$28.6	$8.1	($6.7)	($0.9)	$30.1	$46.9	($5.8)	($4.9)	$36.2	83.2%
EKPC	$3.0	$0.0	($4.2)	($0.1)	($1.1)	$12.6	($3.6)	($0.6)	$8.4	(13.0%)
EXT	$0.5	$0.0	($13.8)	($0.0)	($13.3)	$24.8	($13.8)	$0.0	$11.0	(120.7%)
JCPLC	$6.0	$0.0	($6.1)	($0.2)	($0.0)	$19.0	($5.0)	($1.1)	$12.9	(0.2%)
MEC	$3.5	$0.7	($5.3)	($0.1)	($1.1)	$21.7	($4.6)	($0.7)	$16.5	(6.9%)
OVEC	$0.0	$0.0	($0.3)	$0.0	($0.3)	$1.2	($0.3)	$0.0	$0.9	(28.8%)
PECO	$15.0	$0.2	($10.9)	($0.4)	$4.2	$35.8	($9.1)	($1.8)	$24.9	17.0%
PE	$6.1	$4.9	($6.5)	($0.3)	$4.5	$22.9	($5.7)	($0.8)	$16.4	27.3%
PEPCO	$25.9	$3.8	($8.3)	($0.8)	$21.4	$28.8	($6.9)	($1.3)	$20.5	104.5%
PPL	$24.3	$3.4	($11.5)	($0.7)	$16.1	$42.3	($9.6)	($1.9)	$30.8	52.4%
PSEG	$24.7	$0.0	($13.9)	($0.7)	$10.8	$38.9	($11.9)	($2.0)	$25.0	43.2%
REC	$0.2	$0.0	($0.6)	($0.0)	($0.4)	$2.6	($0.5)	($0.1)	$2.1	(17.0%)
Total	$373.9	$179.3	($256.2)	($14.5)	$297.0	$899.6	($219.9)	($36.3)	$643.4	46.2%

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ARR Allocation MW Share: 2020/2021

	Stage 1A		Stage 1B		Stage 2		Total	
	Out of Zone	In Zone	Out of Zone	In Zone	Out of Zone	In Zone	Out of Zone	In Zone
AECO	28.7%	35.6%	2.7%	26.1%	1.6%	5.4%	33.0%	67.0%
AEP	7.9%	65.8%	0.9%	23.2%	0.0%	2.2%	8.8%	91.2%
APS	8.6%	51.8%	0.8%	35.8%	0.2%	3.0%	9.5%	90.5%
ATSI	26.3%	58.5%	2.6%	9.9%	1.1%	1.6%	30.1%	69.9%
BGE	23.8%	28.6%	0.0%	27.1%	0.1%	20.4%	23.9%	76.1%
ComEd	0.0%	71.7%	0.0%	14.5%	0.0%	13.8%	0.0%	100.0%
DAY	79.7%	2.4%	5.3%	0.3%	1.5%	10.7%	86.6%	13.4%
DEOK	42.2%	31.0%	0.1%	14.9%	0.1%	11.7%	42.5%	57.5%
DLCO	73.3%	0.3%	6.5%	2.1%	8.3%	9.5%	88.1%	11.9%
Dominion	0.7%	63.8%	0.0%	34.1%	0.0%	1.4%	0.7%	99.3%
DPL	22.9%	52.5%	2.3%	12.2%	3.0%	7.2%	28.2%	71.8%
EKPC	21.0%	46.4%	0.1%	0.0%	32.0%	0.4%	53.2%	46.8%
EXT	69.7%	0.0%	30.1%	0.0%	0.2%	0.0%	100.0%	0.0%
JCPL	0.9%	56.8%	0.1%	0.9%	32.3%	9.0%	33.3%	66.7%
Met-Ed	23.2%	65.7%	0.1%	3.5%	0.4%	7.1%	23.7%	76.3%
PECO	11.1%	44.1%	2.9%	29.6%	2.1%	10.2%	16.1%	83.9%
PENELEC	15.2%	61.8%	0.0%	13.6%	1.1%	8.3%	16.3%	83.7%
Pepco	19.1%	30.2%	0.0%	1.6%	4.2%	44.9%	23.3%	76.7%
PPL	0.0%	77.5%	0.0%	8.9%	0.0%	13.6%	0.1%	99.9%
PSEG	27.8%	49.3%	3.3%	11.2%	3.7%	4.7%	34.8%	65.2%
RECO	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0.0%
Total	13.6%	54.9%	1.1%	20.0%	2.3%	8.1%	16.9%	83.1%

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ARR Allocation Revenue Share: 2020/2021

	Stage 1A		Stage 1B		Stage 2		Total	
	Out of Zone	In Zone	Out of Zone	In Zone	Out of Zone	In Zone	Out of Zone	In Zone
AECO	43.6%	31.5%	1.7%	18.4%	1.4%	3.4%	46.7%	53.3%
AEP	15.2%	72.6%	0.2%	11.1%	0.0%	0.9%	15.4%	84.6%
APS	17.8%	57.6%	0.4%	22.8%	0.1%	1.3%	18.3%	81.7%
ATSI	85.3%	12.9%	0.0%	0.6%	1.0%	0.2%	86.3%	13.7%
BGE	83.8%	21.1%	0.0%	-3.5%	0.1%	-1.4%	83.9%	16.1%
ComEd	0.0%	96.9%	0.0%	2.9%	0.0%	0.2%	0.0%	100.0%
DAY	93.8%	0.0%	5.1%	0.0%	0.6%	0.5%	99.5%	0.5%
DEOK	78.2%	15.5%	0.1%	2.1%	0.0%	4.0%	78.4%	21.6%
DLCO	88.9%	0.0%	2.7%	-0.2%	4.9%	3.8%	96.5%	3.5%
Dominion	2.0%	83.6%	0.0%	13.3%	0.0%	1.1%	2.0%	98.0%
DPL	32.1%	51.4%	2.1%	9.3%	1.9%	3.2%	36.0%	64.0%
EKPC	73.3%	13.6%	0.0%	0.0%	12.9%	0.1%	86.3%	13.7%
EXT	69.7%	0.0%	30.1%	0.0%	0.2%	0.0%	100.0%	0.0%
JCPL	1.3%	9.3%	-0.1%	0.2%	87.6%	1.8%	88.7%	11.3%
Met-Ed	31.1%	68.4%	0.0%	-0.5%	0.2%	0.7%	31.4%	68.6%
PECO	6.4%	70.0%	1.7%	14.9%	2.5%	4.5%	10.6%	89.4%
PENELEC	39.9%	50.4%	0.0%	6.2%	0.0%	3.4%	39.9%	60.1%
Pepco	74.8%	10.1%	0.0%	0.2%	11.1%	3.8%	85.9%	14.1%
PPL	0.0%	93.5%	0.0%	5.8%	0.0%	0.8%	-0.1%	100.1%
PSEG	39.7%	49.7%	1.3%	5.3%	2.7%	1.3%	43.7%	56.3%
RECO	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0.0%
Total	33.9%	54.8%	0.4%	7.5%	2.1%	1.2%	36.5%	63.5%

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