

# Geenex Solar

## **PJM INTERCONNECTION QUEUE REFORM DESIGN COMPONENTS**

November 18, 2021



## What is Inter-Cycle Network Upgrade (NU) Funding?

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- Large Network Upgrade costs are spread among two or more cycles.
- Initial Cycle funds NU and Subsequent Cycles reimburse previous Cycle(s) that fund NU.
- Current Serial process allows for Inter-Cycle (cluster) funding for up to five years.
- PJM's proposed Cluster process eliminates it.

## Why Inter-Cycle Network Upgrade (NU) Funding?

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### ❑ Minimize risk of **Cycle Failures**

- Cycle failures occur when the burden of funding Network Upgrades exceeds the financial capabilities of the interconnection customers in a cycle.

### ❑ Cascading cycle failures can lead to **dead zones** containing favorable areas for renewable generation.

- Locations for renewable generation is dependent on resource rich location with acceptable land attributes.

### ❑ Minimize "Free Rider"

- "Free-Riders" in subsequent clusters unfairly benefit from network upgrades.
- "Free-Riders" impact competition.

# Inter-Cycle Network Upgrade (NU) Funding Rules

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## Qualifications for Inter-Cycle NU Funding:

- Available for NU that exceed \$25,000 per MW-MFO in a cycle.
- Limited to Cycles that begin within five years of NU initially being funded.
- Multi-Party Shared Network Upgrade Agreement (MPFCA) contains cross indemnification and contingency measures should one or more projects withdraw from the MPFCA

# Example 1: Rebuild 14.53 miles of 500 kV Line 575 from North Anna to Ladysmith. Total cost: **\$45,043,000**

1 cycle funds

Queue Position	MFO MW	MW Contribution	AE cycle funds	AE \$/MFO
AE2-031	290	34.63	\$2,069,191	\$ 7,135
AE2-094	300	41.5	\$2,479,683	\$ 8,266
AE2-122	800.1	115.02	\$6,872,607	\$ 8,590
AE2-123	800.1	115.02	\$6,872,607	\$ 8,590
AE2-124	800.1	115.03	\$6,876,192	\$ 8,594
AE2-313	314	62.52	\$3,735,658	\$ 11,897
\$ NU/MFO-MW = 45,043,000/3304.3 =				<b>\$ 13,632</b>

- Total output of Cycle is 3304.3 MW-MFO.
- Cost of Network Upgrade/MW-MW = \$13,632/MW
- Does not qualify for Inter-Cycle Network Funding.

Source: [https://www.pjm.com/pub/planning/project-queues/impact\\_studies/af2042\\_imp.pdf](https://www.pjm.com/pub/planning/project-queues/impact_studies/af2042_imp.pdf)

# Example 2: Build new 500 kv line from Rawlings to Morrisville Substation 110 miles. Total cost: **\$400,000,000**

Queue Position	MFO MW	MW Contribution	1 cycle funds		2 cycles funds +	
			AE cycle funds	AE \$/MFO	AE & AF cycle funds	AE - AF \$/MFO
AE2-031	290	50.74	\$14,091,900	\$ 48,593	\$ 8,454,764	\$ 29,154
AE2-033	149	44.27	\$12,295,002	\$ 82,517	\$ 7,376,674	\$ 49,508
AE2-051	150	46.09	\$12,800,467	\$ 85,336	\$ 7,679,939	\$ 51,200
AE2-094	300	103.22	\$28,667,046	\$ 95,557	\$ 17,199,463	\$ 57,332
AE2-122	800.1	258.98	\$71,925,902	\$ 89,896	\$ 43,153,624	\$ 53,935
AE2-123	800.1	258.98	\$71,925,902	\$ 89,896	\$ 43,153,624	\$ 53,935
AE2-124	800.1	258.9	\$71,903,684	\$ 89,868	\$ 43,140,293	\$ 53,919
AE2-147	150	46.83	\$13,005,985	\$ 86,707	\$ 7,803,244	\$ 52,022
AE2-156	100	32.48	\$9,020,594	\$ 90,206	\$ 5,412,116	\$ 54,121
AE2-270	150	49.68	\$13,797,509	\$ 91,983	\$ 8,278,137	\$ 55,188
AE2-313	314	130.64	\$80,566,009	\$ 256,580	\$ 48,337,457	\$ 153,941
AF1-123	880	130.64	<b>EXAMPLE OF "FREE RIDERS" THAT COULD BENEFIT FROM NU.</b>		\$ 21,768,435	\$ 24,737
AF1-124	880	130.64		\$ 21,768,435	\$ 24,737	
AF1-125	880	133.39		\$ 21,768,435	\$ 24,737	
AF1-128	569	205.92		\$ 22,226,666	\$ 39,063	
AF1-236	569	74.96		\$ 34,312,280	\$ 60,303	
AF1-265	150	154.09		\$ 12,490,523	\$ 83,270	
AF2-042	500	130.64		\$ 25,675,890	\$ 51,352	
				\$ NU/MFO-MW = 400,000,000/4000.3 = \$ <b>99,918</b>	400,000,000/8432 = \$ <b>47,442</b>	

- Large Network upgrades are increasing; especially in Dominion's territory.
- More than two cycles would be needed to get the average cycle cost below \$25,000/MW-MFO.
- Maximum number of cycles is limited to those that begin within five years of the initial funding of the Network Upgrade.

Requires additional cycles to reach \$25,000/MW-MFO

Source: [https://www.pjm.com/pub/planning/project-queues/impact\\_studies/af2042\\_imp.pdf](https://www.pjm.com/pub/planning/project-queues/impact_studies/af2042_imp.pdf)

## Contact Information

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