Surplus Interconnection Service: The Scale of the Opportunity and the Needed Reforms

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SIS is a critical part of the solution to PJM's resource adequacy shortfall

SIS provides a **faster pathway** for interconnecting resources that can help serve resource adequacy needs

- Shorter Ix study process: 270 days vs 700 for full Ix study
- Battery storage, a prime candidate for SIS, has the shortest construction timeline of any asset class: median time from GIA to COD of 20 months

SIS offers a pathway for **adding meaningful amounts of UCAP** to existing resources

- Surplus projects can add accredited capacity to existing generators that might not be fully utilizing their CIRs
- This is particularly true for storage, with ELCCs ranging from 57-78% depending on discharge duration

SIS is the **lowest cost** means to achieve the desired ends

- No network upgrades permitted
- Extracts more value from the existing system
- Facilitates the earlier entry of lower-cost generation (and potential reduced run times of older, more expensive generators)

Multiple analyses have shown high, untapped SIS potential in PJM

The extent to which this is realized depends on the creation of a workable SIS process

- **RMI and UC-Berkeley's** analysis and dashboard, respectively, on surplus potential at existing thermal sites demonstrate large potential for accelerated entry of new resources via SIS: in PJM, **estimates of solar and wind resources that could be added range from 60–226 GW** nameplate, lowering energy costs at a time of increasing rate pressures on customers.
- **Gabel Associates**, in their recent report, note that PJM's forecast resource mix for the 26/27 DY includes 9.7 GW ICAP of solar resources, whose accredited capacity is just under 2 GW. ***Adding SIS resources could increase the UCAP available to PJM by 7.8 GW.***
  - *This opportunity for adding UCAP to resources with higher allocated CIRs than their UCAP values will increase by DY 29/30, when it could reach 12.6 GW due to higher ELCC de-rates for wind and solar.*

- For comparison, in their Nov. 7 presentation, PJM indicated a potential RA shortfall of **~10 GW by 2030/31**, assuming a 40% new entry rate.
- A functioning surplus service process could go a long way toward meeting that need.

Resource Class	Effective Nameplate MW	ICAP MW	ELCC %	ELCC Accredited Capacity MW	SIS Potential Capacity MW
Formula	*a*	*b*	*c*	*d = Min a * c or b*	*e = b - c*
Solar Fixed	2,670	1,228	8%	214	1,014
Solar Tracking	13,082	8,462	13%	1,701	6,761
Total	**15,752**	**9,690**		**1,914**	**7,776**

Figure 8: SIS Capacity Deployment Potential

Source: Gabel Associates, "ReSISting a Resource Shortfall: Fixing PJM's Surplus Interconnection Service (SIS) to Enable Battery Storage," September 2024

How does PJM's current approach to SIS limit its utility?

We are glad to see PJM is considering changes to its approach; however, the changes do not yet comprehensively address the limitations and questions listed below

- PJM's surplus interconnection tariff currently dictates that surplus service cannot be granted in three circumstances:
  1. Granting service would require new Network Upgrades;
  2. The service "would have additional impacts affecting the determination of what Network Upgrades would be necessary to New Service Customers already in the New Services Queue;" or
  3. The service "would have a material impact on short circuit capability limits, steady-state thermal and voltage limits, or dynamic system stability and response."

PJM's current proposal is to eliminate this

- While eliminating #2 above is a step in the right direction, the application of "material impact" remains uncertain. In complying with Order 845, PJM asserted to FERC that "*any* impact is the threshold to determine whether a surplus interconnection request is material."[1] It is not clear whether PJM would continue to apply this standard should its proposed tariff changes be accepted.
  - In justifying its "any impacts" standard to FERC, PJM said that this was appropriate because "Tariff Section 36.4(2) provides that generation units requesting surplus interconnection service cannot use any available system headroom." Given that PJM proposes to alter Tariff Section 36.4(2), PJM's prior rationale for its "any impacts" standard no longer applies. Would PJM nevertheless continue to use this standard, and if so, on what basis? If PJM plans to apply a different standard, what is it?

Manual changes needed to clarify this

- **Barring surplus service based on material impacts to the transmission system, above and beyond the requirement that surplus interconnection service not require new Network Upgrades, is not necessary to protect system reliability.**

1. PJM Interconnection, L.L.C., 171 FERC ¶ 61,145, at P 34 (2020).

How can the SIS opportunity be maximized in PJM? (1 of 2)

Building on the changes PJM has already proposed, the following recommendations would enable full use of the surplus Ix service pathway and should be incorporated into PJM's tariff changes:

- Allow SIS for *all* resources that do not trigger network upgrades that would impact other customers
  - This can be expediently achieved by adopting SPP's tariff language, which demonstrates that a tariff without a material impacts prohibition is workable
- Allow SIS eligibility for projects once they have a GIA, as established in Order 2023

We propose that PJM adopt revised tariff language similar to the following:

"Surplus Interconnection Service shall be granted unless doing so would require Network Upgrades other than those (1) located at the Point of Interconnection substation and at the same voltage level as the Generating Facility with an effective Interconnection Services Agreement, or (2) that are System Protection Facilities. If such Surplus Interconnection Service would require network upgrades, then it shall not be granted unless there are no material impacts on the cost or timing of any Interconnection Requests pending at the time the Surplus Interconnection Request is submitted."

+ In addition to corresponding Manual 14H changes that this new language necessitates

How can the SIS opportunity be maximized in PJM? (2 of 2)

In addition, PJM should swiftly act to update its modeling of battery storage resources, to ensure their fair treatment in this and other interconnection study processes

- Update modeling assumptions for storage used in Ix study process → *Requires change to Manual 14B*
  - E.g., do not assume storage would discharge in light load conditions; instead, use same standard applied to pumped storage resources, which are only assumed to be in pumping mode during light load

Longer-term, the following enhancements should be considered and discussed by stakeholders to further improve the surplus Ix service offering

- Create a path for standalone interconnection service for the surplus resource in the event of the existing generator's retirement
- Consider the potential benefits of adopting *pro forma* contractual documents and moves forward with this approach to the extent market participants indicate it would facilitate greater use of surplus interconnection service

Source: GridLab, Surplus Interconnection policy explainer https://gridlab.org/wp-content/uploads/2024/11/GridLab_Surplus-Interconnection_WEB.pdf

Successfully realizing the benefits of SIS is just one of multiple alternative solutions that could address a resource adequacy shortfall in PJM

PJM must ensure it is tailoring appropriate solution(s) to a properly defined need in order to maintain the reliable and affordable grid we all want to see

Other available, alternative solutions:

- Options to ensure increased throughput of viable projects in forthcoming queue cycles, including but not limited to:
  - Robust evaluation and deployment of alternative transmission technologies
  - Automation and other enhancements to study efficiency
  - Expedited transmission build
- Pending generator replacement process
- **An amended surplus interconnection service (SIS) process, as we have described**

Outstanding questions remain in PJM's characterization of the resource adequacy shortfall:

- The magnitude, timing, duration, and location of resource adequacy shortfalls
- Comparative scenario analyses to quantify:
  - Variation in ELCC forecasts, methods, and contributions to UCAP
  - Uncertainty and possible changes in load growth forecasts