Illinois Power Agency
105 W Madison Street, Suite 1401
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06/29/2023

To Whom It May Concern,

I am writing in response to the request for feedback Chapter 7 of the Illinois Shines Incentive program supporting the development and new solar energy generation In Illinois. The request for feedback is in relation to the currently limited solar DC capacity of 155% of the AC capacity for community solar and distributed generation resources.

Eneon is a leading provider of turnkey Battery Energy Storage Systems (BESS), catering to a wide range of applications including community solar and distributed generation. With over a decade of experience in the industry, we have established ourselves as experts in supporting our clients throughout the entire lifecycle of BESS implementation including optimization, design, installation, commissioning, and long-term operations.

Eneon was an early entrant into the DC coupled solar and storage space and has executed on over 50MWh of DC coupled solar and storage projects in the US market to date. We have worked on projects with ILRs from 1.5 to 4.0 and have built out in-house modelling tools to help our clients understand how to optimize DC coupled BESS sizing to various solar DC/AC ratios.

The combination of high ILR solar projects and storage is a natural fit. Due to the quantity of excess solar production, a BESS can be utilized to store excess solar capacity. To maximize overall energy production of a solar + storage project, BESS storage capacity is related to the ILR of the solar system.

It is Eneon's position that there should be no limitations on Inverter Load Ratios other than those conditions which are under the control of the project developer:

- Technology: An example of a natural technical limitation on ILR are inverter short circuit limitations. Inverters have an input DC short circuit rating which dictates the maximum short circuit capacity of the PV array connected to that inverter. This provides a hard limit on how much solar DC capacity can be connected to a given

inverter. This can very across all brands of inverters, with some manufacturers intentionally designing their inverter to accommodate higher ILR.

- Electrical Safety: Equipment rating and electrical standards (including NFPA, NEC, and UL) provide natural guides on solar + storage integration with Energy Storage Systems (ESS), particularly with siting of ESS with respect to site and electrical safety considerations.

- Project Economics: As always, project economics are a key factor in considering solar + storage. Very high ILR solar projects will require a proportionally high BESS storage capacity, resulting in higher CAPEX, substantially impact project financial returns.

  I have attached a white paper that was developed our team to better understand clipping recapturing and modelling. Here Is an excerpt from the paper:

  "Within a certain range, it makes sense to keep increasing the ILR without much consideration of clipping losses, especially if the Levelized Cost of Electricity (LCOE) is less than the price at which energy is being sold. However, there comes a point where it does not make financial sense to continue investing in more capital cost to keep introducing PV modules: when the benefits of selling the gained energy from an increase in ILR are less than the costs associated with this ILR increase."

There are several benefits for maximizing ILR for solar projects:

- Reduced interconnection capacity: Access to land parcels dictates the overall DC capacity of a project, relative to the quantity of solar modules that can be installed. But, with a high ILR, the interconnection capacity of that given parcel of land can be reduced, therefore reducing several EPS burdens including decreasing EPS short circuit contribution and grid instability due to high penetration of interconnected DG, potentially avoiding costly distribution upgrades.

- Although power capacity is an important factor when interconnecting solar projects to the EPS, peak generation during off peak demand periods is of much lower value than having additional generation capacity during high demand periods. Higher ILR solar projects with storage, even without any incentive to do so, can naturally export excess generation capacity to periods where solar production is lower late in the day, but peak demand occurs (for example, weekdays between 4-7 PM). This would have a

double impact of both increasing generation capacity specifically when demand is highest and ensuring that generation capacity comes from a renewable source.

I believe that the current ILR limitations imposed by the program in Illinois are hindering the full realization of solar implementation to its maximum potential. However, recent observations indicate that an ILR ratio of approximately 2.0 (equivalent to 200% of AC capacity) represents an ideal threshold. By embracing this optimized ILR, we can witness a substantial boost in the adoption of solar energy with storage and unlock the utmost potential for solar power on the Illinois grid.

Sincerely,

Huang lu

Founder and CTO

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