This letter is in response to the decision by the Department of Public Services (DPS) to mandate secondary service metering for auxiliary loads on Energy Storage Systems (ESS) deemed ‘sufficiently large’ based on the recommendation by the members of the Joint Utilities (JU).

As discussed at the Interconnection Technical Working Group (ITWG) meeting on February 6th, 2020, the Industry was requested to identify the areas of concern regarding the state-mandate and the negative impacts that this policy change may have on existing and future ESS development. This document includes the Industry’s response to the ITWG’s request, provides a thorough background on the issue at hand, and includes additional technical reasoning and metering policy precedent that the Industry believes contradicts the DPS decision made at said meeting.

**Industry Position Summary/Thesis**

NYSEIA and the ITWG Industry Group (Industry) hereby express disagreement with said mandate noting that both large-scale ESS and large commercial customers on the grid can display large variations in their daily energy profile, and it is common practice right now for large commercial customers to have only one service meter at one location that measures and monitors the customer loads varying over 2 orders of magnitude.

*It is therefore our position that this mandate is unfounded, based on existing precedent as described herein, and the mandate to monitor auxiliary loads shall be rescinded until which time the JU can reconcile the differing treatment of small loads for regular demand customers and ESS customers.* If the JU would like to treat ESS customers differently, they must justify why they are upending years of precedent in metering practice and against the current DPS Metering Guidelines or determine alternative methods of ensuring adequate metering accuracy for both demand and ESS customers.
Overview of Auxiliary Loads for Energy Storage Systems and JU Concerns & Developer Response

The auxiliary metering concern for ESS was first brought up by the Industry at the ITWG meeting on October 20th, 2019. The topic was triggered by an ongoing project-level design dispute between Borrego Solar Systems, Inc. (BSS) and Orange and Rockland Utilities (ORU) in which ORU expressed concerns regarding the accuracy limitations of their metering current transformers (CTs) in monitoring the load consumed by auxiliary devices, primarily HVAC systems, for the ESS device.

Below is a figure showing the accuracy ranges for various CTs specified in the IEEE C57.13 Standard Requirements for Instrument Transformers. Please note that the most commonly used accuracy class for utility-grade CTs is 0.3 shown in green.

![Visualization of Current Transformer Accuracy Ranges](image)

**Figure 1:** Visualization of Current Transformer Accuracy Ranges

What is shown clearly in this graph is that all metering CT’s have a limit below which their accuracy rating is not certified which is 10% of rated current for the 0.3 accuracy class. As an example, for a project using a 0.3 class CT for metering with a peak output or load of X, any generation or load operating below 10% of this peak will not be metered with revenue-grade accuracy. Unfortunately, of the ESS devices that have separate feeds to their auxiliary loads, a vast majority of these devices are sized below the percent of rated current thresholds shown in the chart. Although much of the load consumed by these devices will be masked by the operation of the ESS or by a paired PV system since high auxiliary loads occur during periods of frequent device operation, these loads could operate during device down times and thus be the only source of current moving through the PCC meter.
In order to avoid this uncertainty in metering accuracy, the JU requests that all ESS that utilizes a separately powered auxiliary transformer of ‘significant’ size, a term currently still undefined, will have to separately meter those loads with a second service. At the ITWG meeting on February 6th, 2020, the DPS sided with the JU’s concerns and mandated that all ESS projects in the queue with ‘significant’ auxiliary loads that are too small to be accurately metered will be required to install a separate service.

Although the JU’s concerns regarding metering accuracy are valid, the Industry believes that:

1) These views are inconsistent with on-going utility practices and the New York State Metering Guidelines.
2) Their proposed solution puts a significant financial burden on large-scale ESS
3) Their proposed solution will cause major permitting issues and stakeholder concerns in an already heavily restricted state leading to a significant decrease in available locations for ESS
4) This treatment will send an unintentional market signal restricting certain manufacturers from participating in the New York market.

Following is an overview of each of these topics.

1. Inconsistent with Current Practice and DPS Metering Requirements

Customer loads typically vary a great deal based on the activities and operations at the site or building. For example, the load at a commercial account can fluctuate from less than 10 kW during off-peak hours to more than 1000 kW during peak hours. In other words, the amperage varies over two orders of magnitude. For such a service, the utility does not typically require separate meters or separate services to monitor the energy use at different times or at different magnitudes. In fact, one meter with one set of CTs is used to measure the current draw at all hours. Therefore, there is clear precedence in the JU practice that one meter is sufficient to measure power flow over two orders of magnitude. Given this existing practice for commercial customers, it would be discriminatory and counter to the REV principle of being technology-agnostic to require only ESS projects to install separate service metering for auxiliary loads that may be smaller than 10% of the system nameplate rating.

The DPS Metering Guideline\(^1\) also reaffirms the standard approach to metering discussed above. In particular, revenue-grade meters are required to be tested both at Heavy Load (60-110% of

nameplate rating) and Light Load (5-10% of nameplate rating) conditions so as to ensure accurate metering over a wide range of power flow.

**Section 4.a.iv - Test Loads (pg. 8)**

1) All watt-hour meters shall be tested at approximately rated voltage or the manufacturers recommended voltage and 1.0 power factor at two load points as specified below:
   a) Heavy Load.
      i) Self-contained meters with an “ampere rating” on the nameplate, shall be tested with a load between 60% and 110% of the “ampere rating”
   b) Light Load.
      i) Self-contained meters shall be tested with a load of between 5% and 10% of the “ampere rating” or “test amperes”

**Section 7.e - Referee Tests (pg. 26)**

iii) The objective of a referee test is to determine whether a meter is defective or incorrect to the detriment of the customer. Meter performance is considered acceptable when the final average accuracy test is not less than 98% or greater than 102%.

Given the clear precedence in metering of customer loads, the industry believes that it would be discriminatory practice to have different metering requirements for ESS technology only.

**2. Financial Impacts to ESS Development Due to Separate Service Requirements:**

The Industry feels that financial impacts of these separate service requirements have not been fully vetted by the DPS and JU prior to issuing the mandate. There are two subsets of ESS projects, Standalone ESS and PV+ ESS Hybrid Systems, whose financial impact will differ due to the geographical location of equipment within the site. This is due to the length of trenching and additional underground conductor required to connect a PCC located auxiliary meter to the auxiliary loads. Please review example layouts below of each type of ESS project:
**Figure 2:** Example Standalone Energy Storage System with Location of Auxiliary Transformer in Red, Conductor and Trenching in Blue, and the PCC in Green. Total Distance: ~800 ft.

**Figure 3:** Example PV + Energy Storage Hybrid System with Location of Auxiliary Transformer in Red, Conductor and Trenching in Blue, and the PCC in Green. Total Distance: ~2,700 ft.
As shown in the Standalone ESS example in Figure 2, the distance between the auxiliary transformer and the PCC is around ~800 ft. Using one estimate from a developer of $70/ft for underground trenching and conductor, the total cost of this installation to the developer would be approximately $56,000. Please note that this estimate does not include the cost of the second meter which, according to one developer’s internal utility database including over 17 utility metering package estimates across four JU members, has an average cost of $16,829. This brings the total cost of a second service to over $72,000 for one of the simplest and cheapest instances in which a secondary service would be required.

For the PV + ESS Hybrid example in Figure 3, the distance between the auxiliary transformer and the PCC is around ~2,700 ft, bringing the cost of trenching and conductor to $189,000. This brings the total cost of a required secondary service for auxiliary metering for this example project to just over $205,000. It is important to note that the location of the auxiliary equipment within a Hybrid System is typically unable to be moved closer to the PCC due to proximity requirements of ESS equipment to PV Central inverters.

Clearly the cost of installing separate service metering is exorbitant for even the simplest ESS configuration. The impacts of these costs could be disastrous for any ESS project and inhibit the expansion of ESS in the state of New York.

3. Permitting Impacts to ESS Development Due to Separate Service Requirements

Another major impact of Separate Service Requirements on ESS developers is the amount of additional permitting required for poles with utility equipment.

First, if we look at ESS projects that are currently in the queue, the mandate given by DPS will require every single one of those projects to re-approach the town board and get reapproved for additional poles. The permitting and town board approval process for DERs in NY is long, grueling, and is still one of the biggest barriers to development. This process can include multi-year campaigns, frequent attendance to town board meetings, and ultimately require dozens of revisions and potentially hundreds of engineering and development hours to get a project to where they are as they await the results of their CESIR. Now, the JU and DPS are willing to add a major amount of risk to the development of potentially dozens of projects with hundreds of thousands of development dollars already spent to get to their queue position. The Industry believes that a decision like this is not only determinantal to entire portfolios of developer projects potentially putting their entire businesses at risk for 2020, but that it also is out of line with the state’s ESS goals. It is also clear that this change in standard will ultimately slow development state-wide and weaken the relationships and reputation that DERs are building with communities in NY.
So far we have only examined the potential permitting impacts on projects existing in the queue, however, the Industry emphasizes the tremendous impact this will have for future development. Dozens of towns around New York State are creating more and more stringent permitting guidelines with major restrictions on poles that can be placed on a site in order to limit the number of projects in their area. Developers fight these restrictions every day and many of us, with the help and cooperation of the utilities, have been able to reduce site and pole visibility sometimes with major cost implications that limit project revenue. Getting a few poles for a site is already near impossible in most areas of NYS, and, with the addition of this metering requirement, developers will have to add as many as two additional poles running in parallel to the typical interconnection package. The visual impact in the eyes of town citizens cannot be understated. One company, for example, has had to beg on their hands and knees for projects in a town where they developed a nearly invisible interconnection package with only one new utility pole. If those projects had this same requirement, they most certainly would never have been approved.

4. Inverter Manufacturer Discrimination Due to Separate Service Requirements

The Industry’s final concern is regarding the messaging that this decision will send to the inverter manufacturer market across NY. As mentioned near the end of our discussion at the ITWG, not all ESS systems have separately serviced auxiliary loads. For example, many inverter manufacturers designed their ESS systems with only a single connection to the grid in which all charging, exporting, and loading occur. This begs the question of how will these systems be separately metered?

If the answer to this question is that the separate service requirements only apply to projects that have separately serviced auxiliary loads, then it is quite obvious to foresee what will happen next: the Industry will prioritize the purchase of inverters that don’t have separate aux services in order to avoid the exorbitant cost of the second service connection. This policy would create a discriminatory NY ESS market when it should remain technology-neutral to ensure adequate suppliers for continued market growth.

But, if the answer to this question is that inverters without separate auxiliary services cannot be used in NYS, then the policy would clearly be discriminating against several manufacturers. We will be sending a message to the entire manufacturer community that inverters designed to meet national needs, that have gone through rigorous international testing and operate in global markets, are not satisfactory for the NY market due to artificial constraints unseen anywhere else.
Thanks to the hard work of DPS and NYSERDA, we already have a policy that differentiates use cases for systems with and without separate auxiliary services; projects that want to participate in the capacity market versus those who do not. By applying this policy indiscriminately of market participation, we will end up eliminating certain manufacturers from the New York market instead of providing developers with the option to procure equipment that best serves the market they want to participate in.

**Conclusion**

As outlined in the opening thesis, supported by the content above, the Industry strongly disagrees with DPS’s decision to require separately serviced auxiliary metering for large-scale ESS as it is (1) no different than large-scale load customers on the grid with large variations in their daily energy profile, (2) has significant financial impacts to ESS developers, (3) will halt development around the state due to permitting constraints, and (4) that it will create unfair advantages to one group of manufacturers over another which is counter to the technology-agnostic approach outlined in state-wide policy.

As stated previously, it is therefore our position that this mandate is unfounded, based on existing precedent and the mandate to monitor auxiliary loads shall be rescinded until which time the JU can reconcile the differing treatment of small loads for regular demand customers and ESS customers. If the JU would like to treat ESS customers differently, they must justify why they are upending years of precedent in metering practice and against the current DPS Metering Guidelines or determine alternative methods of ensuring adequate metering accuracy for both demand and ESS customers.