January 31, 2024

Tom Ferguson

Energy Storage Programs Manager  
Massachusetts Department of Energy Resources  
100 Cambridge Street, #1020   
Boston, MA 02114

Dear Mr. Ferguson,

OnSite Renewables (“OnSite”) is writing to offer public comment on the *Charging Forward: Energy Storage in a Net Zero Commonwealth* report. OnSite is a Massachusetts based energy storage developer that currently has over 430 megawatts (“MW”) AC of behind-the-meter (“BTM”) battery energy storage systems (“BESS”) in the interconnection queues of the three Massachusetts Electric Distribution Companies (EDCs) – National Grid, Eversource, and Unitil.

We thank the Department of Energy Resources (DOER) for the opportunity to provide comment and its ongoing efforts to support storage development. We support the findings of this report and further actions to address the interconnection issues that present a barrier to meeting our shared storage goals.

***Background***

OnSite’s BESS are designed to be installed behind the electric meters of Massachusetts businesses and to serve the electric load/demand of these businesses when the state’s electric distribution system is experiencing peak load that strains its ability to serve all customers. By serving the businesses’ electric load/demand with the BESS rather than from the state’s electric distribution system, OnSite’s BESS can significantly reduce the strain on the state’s system. Businesses that host systems receive lease payments for siting the BESS on their properties and Massachusetts electric ratepayers receive the benefit of a more stable electric distribution system that requires fewer costly rate-based upgrades. Massachusetts also receives the benefit of a more efficient and reliable electric distribution system, the ability to safely accept higher amounts of renewable energy generation, and a reduction in climate altering Greenhouse Gas Emissions (GHG).

The two state programs OnSite is developing BESS to operate in are aimed at increasing the number of MW of energy storage in the state and meeting the state’s 1000 MW hour energy storage goals by December 31, 2025, as detailed in [An Act to Advance Clean Energy, Chapter 227 of the Acts of 2018](https://malegislature.gov/Laws/SessionLaws/Acts/2018/Chapter227).

* The [ConnectedSolutions Program](https://www.masssave.com/business/programs-and-services/commercialconnectedsolutions) (CS), incentivizes placing batteries behind the electric meters of businesses to serve the electric load of those businesses during peak load events. Peak load events often occur on the local distribution system on the hottest afternoons in the summer when air conditioning loads can cause the distribution system to hit a load peak, or the coldest days of winter when electric heating can cause a distribution system load peak.
* The [Clean Peak Standard](https://www.mass.gov/clean-peak-energy-standard) incentivizes using batteries to store the energy produced in the middle of the day by solar energy projects when the load on the distribution system is low, and later discharge the batteries onto the distribution system in the afternoon as load is rising. Operating in this manner offsets the strain on the system and GHG emissions caused by trying to serve the increasing load from traditional gas turbine electric generation stations.

***Comments on “Charging Forward: Energy Storage in a Net Zero Commonwealth”***

OnSite is very supportive of the goals stated in this report and its larger study and feels the DOER has done an excellent job in developing them. We support the vision for energy storage in the Commonwealth detailed in the report and its associated study and hope to support the DOER in any way we can to make this vision a reality.

The following statement is in the report under the key finding number 3, on page 7:

*“The Study found that the Commonwealth is more than halfway to its installed energy storage goal of 1,000 MWh by 2025 with the Electric Distribution Companies (“EDCs”) reporting 550 MWh as of February 15, 2023.”*

The remaining 450 MWh plus more, is expected to be operational by the end of 2025 based on data from the EDCs and ISO-NE. OnSite’s 430 MW of 3-hour batteries represents a potential 1,290 MWh of BESS in the Commonwealth and we are one of the largest BESS developers in the Commonwealth. We filed all of our interconnection applications with the EDCs in 2022 and a few in 2023. The majority of these are in National Grid’s territories. As of January 30, 2024, we have executed two Interconnection Service Agreements (ISAs) with the EDCs, and both were executed in January 2024. These 2 projects may be operational by December 31, 2025 to help meet the Commonwealth’s 1000 MWh goal (as detailed above), but the rest of OnSite’s portfolio likely will not.

As discussed in Section 3 (III) on page 9 in the report, interconnection has been cited by developers ”as one of the top barriers to deployment.” The report also states that “grid operators make conservative assumptions regarding energy storage system operations, leading to long study times, imposition of overly restrictive operational schedules, and/or expensive interconnection costs.” OnSite can personally attest to these statements and add that interconnection has been our most formidable barrier.

The majority of energy storage projects in the EDCs interconnection queues have application filing dates between late 2021 and the present. None of these projects will have a faster path than OnSite’s in getting through the interconnection process due to how the EDCs are modeling and studying the projects, and **OnSite therefore believes that it is likely the Commonwealth’s 1000 MWh by December 31, 2025 goal will be missed.** The details we include below about OnSite’s interconnection struggles are not specific to OnSite and offer a cautionary example of exactly how the EDCs have complicated the interconnection process and slowed the path to commercial operation for all energy storage projects in the Commonwealth.

1. ***Interconnection Concerns***

OnSite is deeply concerned about the current policies and approach of the EDCs towards energy storage interconnection. Without significant changes, energy storage interconnection will remain in limbo for many years to come. There are several critical roadblocks that hinder the integration of energy storage projects in Massachusetts. Interconnection is the most significant.

Over the past four years, the cost of interconnection upgrades borne by developers have risen rapidly and the industry is reaching a point where developing an energy storage project is financially feasible, but the cost of interconnecting the project to the utility’s distribution system is *not* financially feasible. Over the past 4 years, interconnection costs have risen by as much as 800% and the timeline to complete the utility’s studies has increased from 3 months to *at least* 18 months **(Figure 1).**

It is OnSite’s view that interconnection cost increases are due to *how* the projects are studied by the EDCs, rather than the actual potential impacts the projects could cause to the grid.

* 1. ***EDC’s Worst-Case Scenario Operating Schedule***

The EDCs are studying energy storage projects using a Worst-Case Scenario study methodology that assumes the systems will charge from 11pm to 3pm in Summer and Winter, 11pm – 4pm in Fall, and 11pm – 5pm in Spring. These charge schedules ensure that the charging windows overlap with the peak hour of the peak day in each season other than winter. Studying energy storage projects assuming they’re charging at full capacity during the peak hour of the peak day in the summer creates a very high likelihood of the project causing thermal overloads of the grid’s infrastructure, which results in the project being responsible for the cost of replacing miles of distribution feeders, one or more substation transformers, and in certain cases, entire substations. These are the most significant and expensive upgrades possible and it is OnSite’s view that the vast majority of these upgrades would not be required if these energy storage projects were studied using a charge and discharge schedule that matches how they intend to operate. **(Figure 2 graphs)**

The goal of the CS program is to discharge these BESS during peak events to reduce the load on the system. If OnSite’s BESS are **not** discharging during those peaks, they aren’t providing the environmental benefits the CS and Clean Peak programs were created to provide and are missing out on the program’s revenue streams, which represent the majority of the revenue that makes the BESS financially feasible.

Additionally, the Figure 2 graphs show that the utilities’ mandated schedule assumes the BESS will discharge in the afternoon and evening when the load is already dropping, which would result in the load curve getting steeper. That would cause additional strain on the distribution system. Energy storage is supposed to be used to level the load curve, not increase the curve’s climbs and drops, which is what the utilities schedules are causing.

The way the BESS are modeled assumes they will be operated in a manner that provides limited benefit to the grid, misses out on material revenue streams, and maximizes potential upgrade costs.

* 1. ***Overlaying the Operating Schedule on a 10 Year Load Forecast***

The EDCs are overlaying the worst-case-scenario operating schedule on a 10-year load forecast that is not being shared with developers. The EDCs have repeatedly declined to share the forecast with OnSite when asked. The forecast assumes increased load, 10 years in the future, which exacerbates the likelihood of energy storage projects causing thermal overloads on the local feeders and substation transformers. If thermal overloads occur in the EDCs models, the developers are assigned the cost of the upgrades. The upgrades are therefore based on theoretical load forecasts and worst-case scenario modeling that combine to create extremely low probabilities that the energy storage projects are the trigger of a thermal overload. Similarly, with that sort of modeling the probability that a thermal overload will occur in the timeframe that the energy storage project will enter commercial operation is also extremely low. If the overload does occur, it is more likely to happen after the energy storage project enters commercial operation with an unrelated load addition causing the overload. Regardless, the EDCs are including the upgrade costs for feeder and substation upgrades in the costs on the ISAs of energy storage projects and requiring developers to pay for the upgrades.

* 1. ***Untenable Costs of Interconnection***

OnSite filed interconnection applications for over 100 5MW BESS with an assumption of $750,000 of interconnection costs for each project. Preliminary impact studies received to date have had an average interconnection cost of approximately $5 million per project. In one example,OnSite’s 5 MW project in Seekonk is sharing the cost of replacing an entire substation with a 1.5 MW PV & battery project. OnSite’s estimated share of the $15MM substation replacement cost is $11.5MM. Currently, OnSite’s interconnection costs represent 60% of the cost of the project. Historically, interconnection has represented 10% or less of the project cost. Requiring a single developer to bear so much of the cost, which traditionally was the responsibility of the utility, is unrealistic and disincentivizes investment in the space – investment which is critical to reaching the Commonwealth’s goals.

1. ***Onsite’s Ongoing Participation in Improving Interconnection in the Commonwealth***

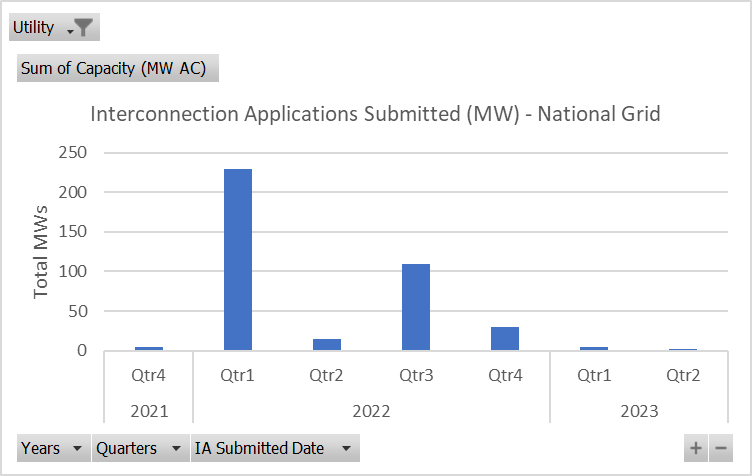
In section V. *Other Issues impacting energy storage* subsection A. *Interconnection* on page 19 of the *Recommended Policy & Program Designs* portion of the report, it is noted that several working groups are seeking “*to standardize and improve energy storage interconnection processes on the distribution system.”* OnSite is active in these groups and our director of interconnection is a member of the Energy Storage Interconnection Review Group (“ESIRG”). Similarly, OnSite has filed written testimony in the Grid Modernization Advisory Council (“GMAC”) on the EDCs’ electric-sector modernization plans (“ESMPs”), and is actively participating in National Grid’s Energy Storage System Operational Parameters Docket (DPU Docket 23-115) with the Massachusetts Department of Public Utilities (“MA DPU”).

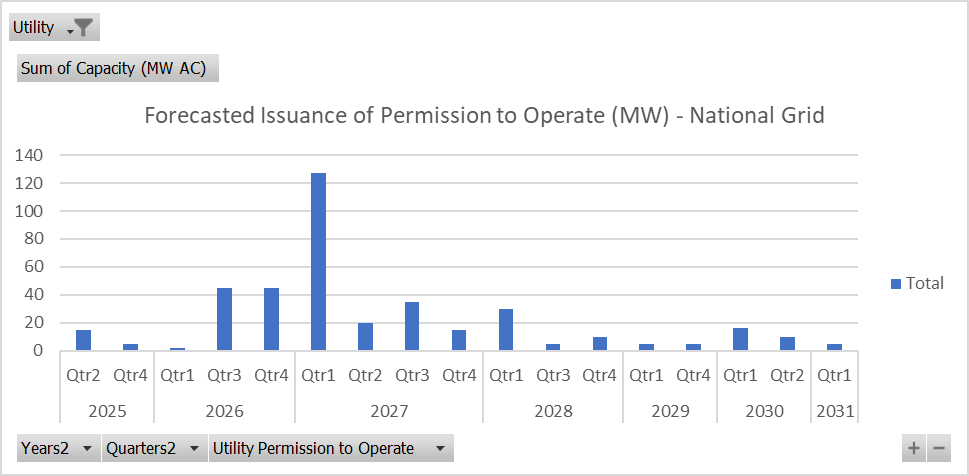
OnSite is committed to improving the prospects on energy storage in the Commonwealth and is happy to lend our support to the DOER and this report and its related study.

Sincerely,

Silas Bauer  
OnSite Renewables

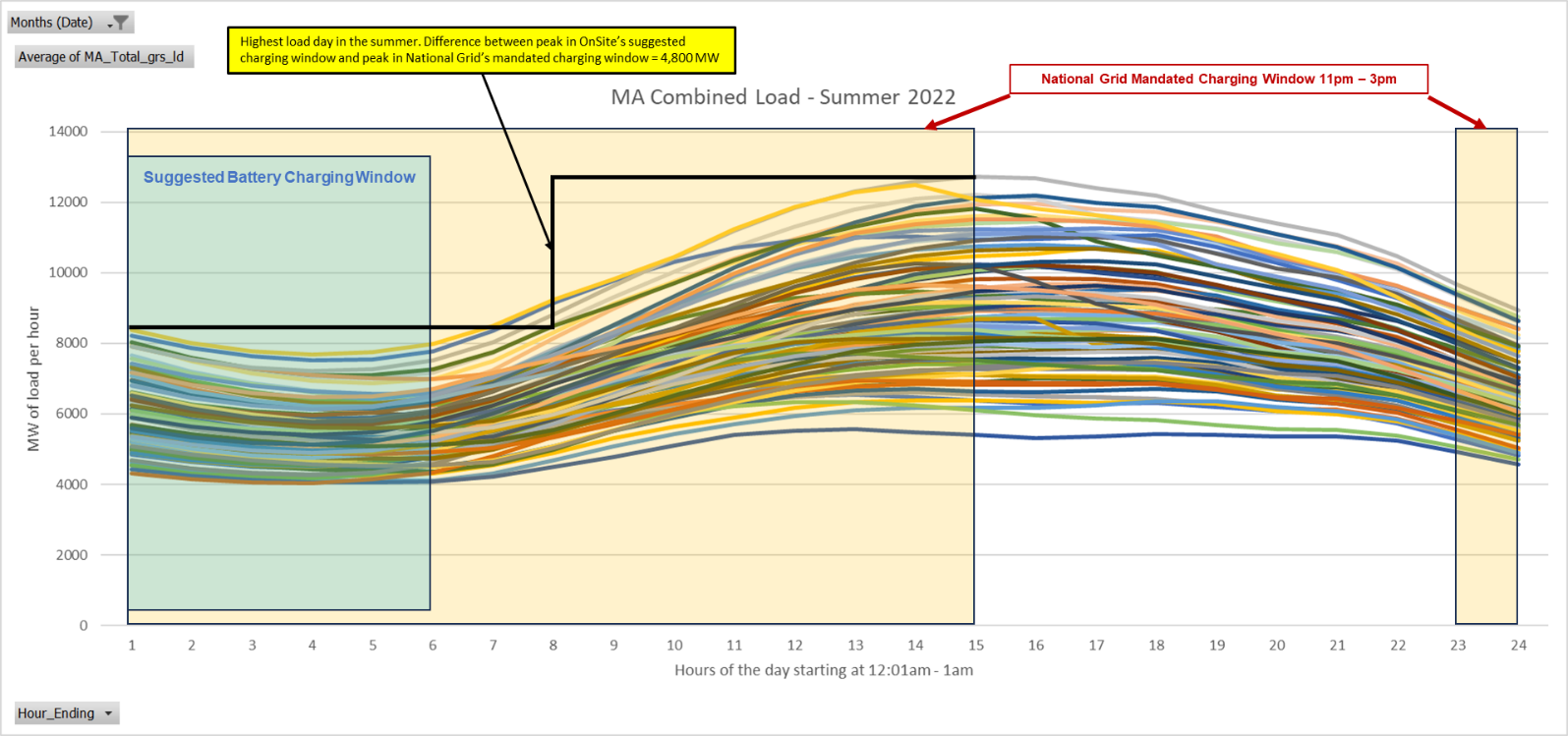
**Figure 1: Interconnection Study Timelines**

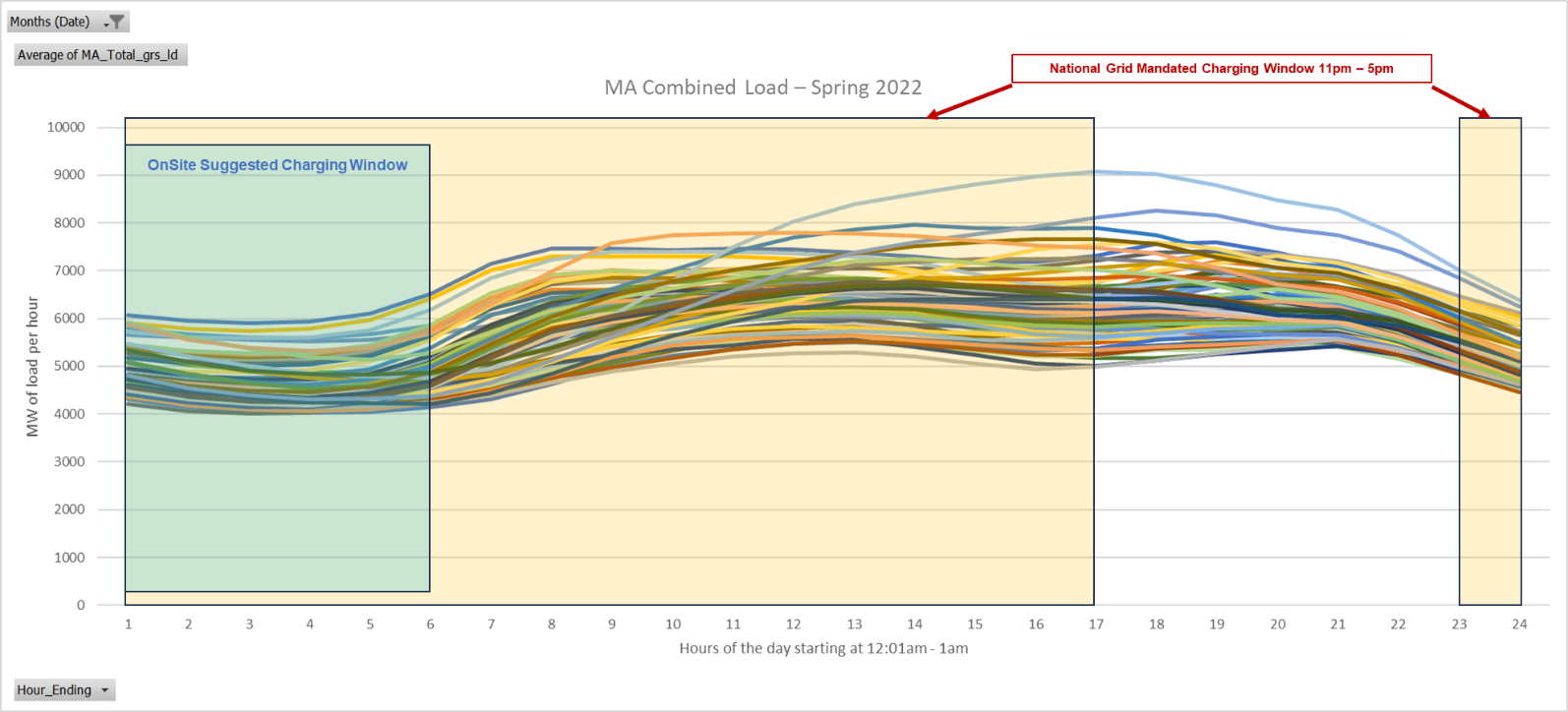
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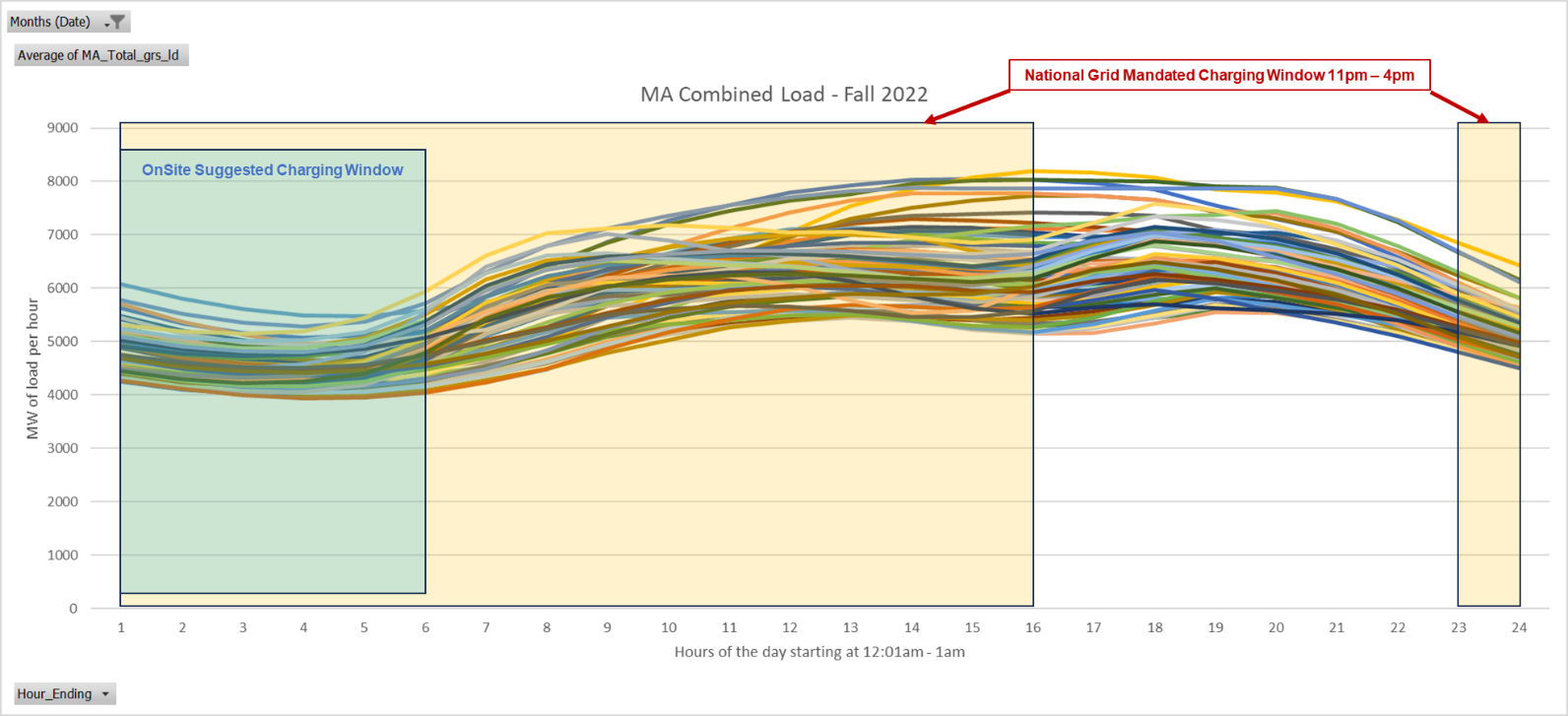
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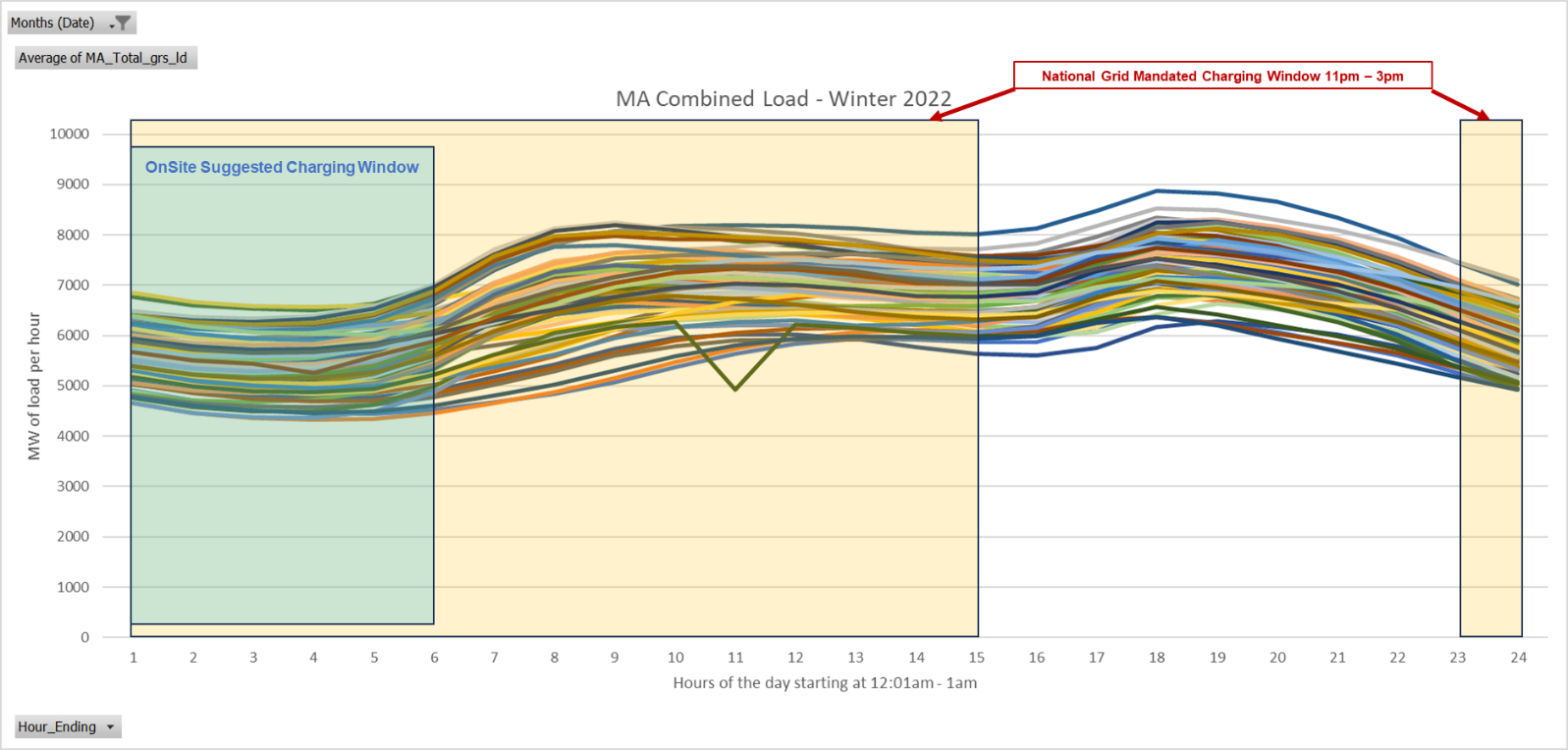
*Longer study timelines lead to very long waits before projects can start operating.* *OnSite is estimating that the majority of its projects will reach Permission to Operate (PTO – permission to discharge and charge on the distribution system) from National Grid by 2026 into 2027. OnSite estimates that none of its projects will receive PTO prior to Q2 of 2025. Most projects will require 4-5 years to complete National Grid’s studies and construction timeframes – time from filing an interconnection application to PTO (historically this timeframe was 1-2 years).* ***National Grid stated in its Sept. 2023 ESMP that it alone will exceed the State’s 2025 energy storage target based on the projects in its interconnection queue at the end of 2022. Data shows that OnSite projects made up approximately 75% of National Grid’s interconnection queue at the time.***

**Figure 2: Interconnection Study Charge/Discharge Schedules**

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*National Grid’s mandated charging schedule increases GHG emissions, increases the cost of interconnection, burdens ratepayers and developers with unnecessary costs, and kills projects, harming the state’s ability to achieve its aggressive GHG reduction and energy storage goals.*

*ISO-NE* [*2023 ISO-NE Variable Energy Resource (VER) Data Series (2000-2022) Rev. 0*](https://www.iso-ne.com/static-assets/documents/2023/05/2023_isone_ver_dataset_2000_2022_rev0.zip) *from:* [*https://www.iso-ne.com/system-planning/planning-models-and-data/variable-energy-resource-data/*](https://www.iso-ne.com/system-planning/planning-models-and-data/variable-energy-resource-data/)