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Q1 2021 Quarterly Summary

STORAGEIQ QUARTERLY SUMMARY – Q1 2021

Customized Energy Solutions (CES) and the U.S. Energy Storage Association (ESA) are pleased to provide the StorageIQ Q1 2021 Quarterly Summary. Subscribers to the CES "StorageIQ" Service receive monthly in-depth reports detailing relevant RTO/ISO actions, rulemaking, key changes, as well as state and regulatory proceedings that impact the energy storage industry. At a fraction of the cost of in-house experts, "StorageIQ" allows you to stay ahead of the curve and capitalize on evolving storage markets. Find out more about "StorageIQ" today!

NORTHEAST (ISO-NE, NYISO, PJM)

In the first quarter of 2021 in New England, there was big news on the ISO-NE Capacity market, as auction prices cleared in the $2.50-$4.00/kW-month range, up from last year, with over 600 MW of stand-alone battery energy storage resources clearing. Many of these resources took advantage of the last opportunity to lock in Capacity prices for seven years, as ISO-NE filed its compliance with FERC to end the practice. It was also significant for so many batteries to clear the Capacity market, as Offer Review Trigger Price (ORTP) parameters have yet to be established for that technology. But ISO-NE and stakeholders did finalize two sets of such parameters, and filed both at FERC in a "jump ball" filing in early April. Also at ISO-NE, the Transmission Owners only slightly revised their proposal to formally allow behind-the-meter generation to reduce load for purposes of allocating transmission costs, despite receiving some criticism from the Internal Market Monitor and some stakeholders, leaving many opportunities for energy storage resources in place.

At the state level, in Massachusetts, after some back and forth between the legislature and the governor, a landmark climate bill was signed into law, which overhauls the state's climate rules and focuses efforts on environmental justice. The MA Department of Energy Resource (DOER) posted several items on the new Clean Peak Energy Standard, including qualified resources and actual monthly system peaks for 2020, and a proposal for long-term contracting. In Connecticut, the Public Utilities Regulatory Authority (PURA) issued a straw proposal for an Electric Storage Program Design in the grid modernization docket and discussed it with stakeholders.

The NYISO Class Year 2019 interconnection study process concluded in Q1 2021 with some proposed storage projects in downstate being "mitigated". The saga around Buyer Side Mitigation (BSM) keeping state favored project from entering the in the Capacity market continued this quarter. NYISO asked a DC court to review FERC's 2020 rejection of their proposal to make BSM exemptions easier for resources preferred by the state to get. The NY PSC also asked FERC to reconsider that application of BSM to storage resource because a recent Biden Executive Order requires review of any Trump-era decision that might hinder decarbonization.

In January, NYISO filed their Co-located Storage Resource tariff with FERC capping off a year's worth of work for what NYISO characterized as the most "expeditious" way to get paired renewable and storage projects in the market. In March NYISO also kicked off the 2021 project to design a participation model for hybrid facilities of storage and a generator(s) that act as a signal unit but warns the added complexities will be challenging.

Also in January, Con Ed filed its redacted bidding rights contract signed in December 2020 with the 100 MW storage project award to 174 Power Global. NYSERDA, who has been silent on how it will continue to support the states storage goals with waning funds for its incentive programs, did ask the NY PSC this quarter to consider increasing the 350 MW bidding right contract goal for the utilities after the Bidding Rights RFP round expected in 2021.

In PJM in Q4, stakeholders learned a lot about what looks to be the final version of ELCC rules for Capacity Storage / Hybrid resources and the beginnings of PJM's Order 2222 compliance filing. These policy developments were generally positive for storage interests as PJM released what will likely be their final ELCC Capacity values for storage resources and, if PJM's ELCC filing is approved by FERC, Capacity Storage Resources will likely see an increase the capacity value for

the 2023/2024 Base Residual Auction (BRA). FERC and PJM staff are deliberating, within traditional compliance filing processes, about the final details and participation structure for Capacity Storage Resources and the potential "transition mechanism" that would put in place 10-year capacity value floors for certain resource types including storage. In addition, PJM has begun efforts to comply with FERC Order 2222 which mandates the facilitation of DERs into ISO/RTO markets. However, PJM recently received a 6 month extension from FERC which extends the Order 2222 compliance filing deadline to 2/1/22 and requires PJM to provide status reports to FERC on 5/10/21. Also in Q1, progress on new rules for Storage-as-Transmission stalled as PJM's initial proposal hit a road block in the Markets & Reliability Committee. Stakeholders voted to table the proposal and sent PJM back to the drawing board to develop rules for storage as transmission plus wholesale market participation. PJM has committed to taking this back up in the Planning Committee, however, no further action has been taken.

The biggest developments for states in the PJM region came from Virginia, Michigan, New Jersey, and maybe most surprisingly, Kentucky. Appalachian Power in Virginia issued RFPs to begin complying with the Virginia Clean Economy Act which includes a 3,100 MW energy storage target. The Michigan Public Services Commission established a working group on Distributed Energy Resources (DER) that will study DER rate design issues related to the growth of DERs. In January, the New Jersey Board of Public Utilities (BPU) approved an investment of $166 million in an electric vehicle charging project that includes the installation of 40,000 residential charges, 3,500 commercial chargers, and 1,000 Direct Current Fast Chargers (DCFC), which could potentially be aggregated to offer wholesale market services. Lastly, on January 12th, Louisville Gas and Electric Company and Kentucky Utilities Company issued an RFP for 300-900 MW of additional generation capacity and at least 100 MW of battery storage from 2025 to 2028. The energy will be needed to replace 3 coal-fired plants expected to retire between 2025 and 2028.

CENTRAL (ERCOT, MISO, SPP)

In ERCOT, 2020 wrapped with one of the most comprehensive market design structures for energy storage as can be found in the country. This design includes elements for DC-coupled hybrid storage, which nearly sets ERCOT apart from other US ISOs/RTOs in terms of the ability to accommodate these complex projects. For storage, though, a number of items were left on the table at the conclusion of last year, and it is questionable that the same progress will be realized moving forward. NPRR 995, *RTF-6 Create Definition and Terms for Settlement Only Energy Storage*, was the first Protocol Revision placed in ERCOT's "Parking Lot". This means the item will be of a lower priority while Staff focuses on the "Passport Project, which represents the core market design changes approved in 2020, including those for energy storage and Real Time Co-optimization. ERCOT has also formally concluded the Battery Energy Storage Task Force (BESTF) despite strategic matters such as storage for Black Start or Reliability Must-Run (RMR) having not yet been discussed in the stakeholder process. Staff has noted that such items can be brought up in the appropriate, existing subcommittees.

One item that has remained under active discussion is participation in the market of behind-the-meter (BTM) energy storage. Stakeholders have attempted to clarify with ERCOT staff how storage will qualify and register and if any caps on participating in certain market products may exist. These conversations, though, have been bogged down by other priories and concerns surrounding energy storage, such as market saturation, Ancillary Service performance, and broader market issues such as 4 Coincident Peak (CP).

Without question, though, the biggest issue coming out of Q1, 2021 is February's winter weather event. Texas energy leadership saw an almost immediate turnover in leadership after the storm, and questions remain where authority will lie and how the market could be restructured to prevent the widespread impacts to electric service from happening again. There have been plenty of questions has to how energy storage should be treated and best utilized during such an emergency, but such matters will probably take some time to be resolved.

In MISO, ISO staff and stakeholders have held extensive discussions pertaining to FERC Order 2222 throughout Q1. These discussions have been largely via Distribution Coordination framework DER workshops that have been held with Distribution Companies, and the Distributed Energy Resource Task Force (DERTF), which reports up to the Market Subcommittee (MSC). Specific issues have been or will be split off to other committees including the Resource Adequacy Subcommittee (RASC) and the Interconnection Process Working Group (IPWG). Early work in these discussions has focused heavily on telemetry and data requirements, and MISO has indicated a preference towards single-node aggregation for DERs and self-scheduling of DERs less than 1 MW. MISO believes that the Electric Storage Resource (ESR) and the Dispatchable Intermittent Resource (DIR) participation models allow for flexibility within existing system parameters.

In addition, stakeholder discussions on hybrid participation models and capacity accreditation continue happen at the MISO Market Subcommittee (MSC) and Resource Adequacy Subcommittee (RASC). With regards to Surplus Interconnection Service, the additional opportunity for market participants to apply for Surplus Interconnection Service at decision point 2 in prior to an executed GIA continued to take shape in Q1. Finally, on March 4, MISO filed a request to extend implementation of Order 841 Tariff changes from June 6, 2022, to March 1, 2025. Stakeholders have expressed, and MISO has acknowledged, frustration with MISO taking this action without public discussion. MISO requested a response from FERC by May 4, 2021.

SPP has been discussing the methodology for accrediting hybrid facilities for Resource Adequacy for many months now. However, finally, a path forward became visible in Q1 as SPP made the decision to utilize the already existing accreditation methodologies for stand-alone systems in a sum-of-the-parts method. In this accreditation process, SPP will consider physical limitations of the Generator Interconnection Agreement, DC:AC inverter ratio, and inverter limitations to cap the total accreditation. The hybrid accreditation process will be re-addressed when the penetration level for hybrid resources reached 2GW.

Also in Q1 in SPP, Storage-as-Transmission continued to make progress as SPP was finding approval in the Markets & Operations Policy Committee (MOPC) across various issues and whitepapers. At a high level, these issues and whitepapers establish procedures for managing state-of-charge for ESRs as a Transmission Only Asset, handling ESR transmission facilities when the ESR is unable to cover a transmission issue, or other shortcomings. Additionally, at the end of Q1, the Cost Allocation Working Group (CAWG) was hosting discussions surrounding a strawman proposal covering how costs will be allocated for Storage as A Transmission Only Asset (SATOA) based on the voltage issue it is solving, how much capacity is provided during the transmission issue, and affects to the energy markets. Conversations will continue throughout Q2, with an eye on approval in Q3.

Additional members were added to the Energy Storage Resource Steering Committee (ESRSC) as the committee's scope expanded to include the development of policy and changes to the SPP's governing documents. The ESRSC will be focused on policy development for SATOA and ELCC capacity accreditation in for storage in the near-term. Staff stated that multi-use storage issues are on hold, the FERC Order 841 Compliance filling remains on-track, and the remaining ESR issues are outside the scope of the required compliance filing. SPP is still trying to wrap its head around FERC Order 2222 compliance and the required changes to the Tariff.

WEST (CAISO, EIM)

In California, both the CAISO and California Public Service Commission (CPUC) focused on preparing for potential extreme weather over the coming summer while discussing restructuring the Resource Adequacy (RA) program to better serve the needs of the changing grid. At the CAISO, the 2021 Summer Readiness initiative focused on a streamlined process to improve export, load, and wheeling priorities, and implementing a Minimum State of Charge (MSOC) requirement for RA storage resources, among other changes. The storage community voiced strong concerns on the CAISO's imposing MSOC,

ultimately leading the CAISO to limit the criteria on the system condition when the MSOC requirement would be activated and to launch the Energy Storage Enhancement initiative in the second quarter to further hash out operational issues. The CAISO's RA Enhancement initiative was split into two phases: Phase 1 focusing on implementing planned outage process, MSOC for RA storage, and procuring backstop capacity in 2021 while the headier issues such as Unforced Capacity (UCAP) evaluations, system RA and flexible RA requirements, and Must-Offer Obligations (MOO) requirements will be discussed in 2022 and 2023 under Phase 2. Because of the controversies and expedited timeline around these initiatives, the Market Surveillance Committee at the CAISO has published several opinion papers, examining the CAISO's designs and detailing its support for the designs. Additionally, the CAISO continued to work on its Local Capacity Requirements (LCR) studies, including more details on the amount of storage capacity a local area can accommodate as well as the effectiveness of such capacity at a 4-hour duration under current RA design.

To ensure reliable electricity services, the CPUC issued several decisions authorizing the three IOUs to procure additional resources -- including energy storage -- for the summer, as well as increasing the Planning Reserve Margin (PRM) and developing and modifying several commercial and residential Demand Response programs. Additionally, continuing the RA issues from the last quarter, the CPUC held several workshops under tracks 3B.1, 3B.2 and 4 where stakeholders presented their proposals on reforming the RA construct. Throughout March, 2021, stakeholders commented and replied to others' comments on these proposals, debating their merits and flaws. Because of the complexity of reforming the existing RA construct, the issues under Track 4, including developing RA values for behind-the-meter resources, might not get much attention at this time. The CPUC is expected to issue a directional decision in June 2021. Meanwhile, in the Microgrid proceeding, the CPUC issued a decision adopting a range of enhancements meant to further accelerate the deployment of backup power for resiliency in the face of blackouts and fire risks throughout the state.

Throughout the first quarter, the EIM continued to integrate Balance Authorities (BA) both within and outside of California, expanding its footprint to cover a larger area of the West in its market construct.

ABOUT CES

Customized Energy Solutions (CES) is a consulting and services company with over 20 years of diversified experience across North American energy markets. CES's Emerging Technologies group provides a range of products and services to help project developers, investors, technology companies and other clients understand the evolving market rules and value proposition of new energy storage technologies. Combining our practical experience running daily operations of over 340 MW of energy storage facilities and our experience advising clients on policy developments in energy markets provides our team with superior credentials that sets our consulting services apart from other provides.

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