BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to consider policy and implementation refinements to the Energy Storage Procurement Framework and Design Program (D.13-10-040, D.14-10-045) and related Action Plan of the California Energy Storage Roadmap.	Rulemaking 15-03-011 (Filed March 26, 2015)

COMMENTS OF THE CALIFORNIA ENERGY STORAGE ALLIANCE ON JOINT STAFF PROPOSAL AND WORKSHOP

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COMMENTS OF THE CALIFORNIA ENERGY STORAGE ALLIANCE ON JOINT STAFF 9PROPOSAL AND WORKSHOP

In accordance with Rules of Practice and Procedure of the California Public Utilities Commission ("Commission"), the California Energy Storage Alliance ("CESA")[1] hereby submits these comments on the *Administrative Law Judge's Ruling Seeking Comments on Joint Staff Proposal* issued by Administrative Law Judge Cooke on May 18, 2017 and on the related workshop held at the CPUC on June 2, 2017 (together, "Ruling").

I. INTRODUCTION.

CESA appreciates the work and consideration of energy storage issues by the staffs of the Commission and the California Independent System Operator ("CAISO") in preparing the Joint

[1] 8minutenergy Renewables, Adara Power, Advanced Microgrid Solutions, AES Energy Storage, AltaGas Services, Amber Kinetics, Bright Energy Storage Technologies, BrightSource Energy, Brookfield, Consolidated Edison Development, Inc., Customized Energy Solutions, Demand Energy, Doosan GridTech, Eagle Crest Energy Company, East Penn Manufacturing Company, Ecoult, ElectrIQ Power, ELSYS Inc., eMotorWerks, Inc., Energport, Energy Storage Systems Inc., Enphase Energy, GE Energy Storage, Geli, Green Charge Networks, Greensmith Energy, Gridscape Solutions, Gridtential Energy, Inc., Hitachi Chemical Co., IE Softworks, Innovation Core SEI, Inc. (A Sumitomo Electric Company), Johnson Controls, LG Chem Power, Inc., Lockheed Martin Advanced Energy Storage LLC, LS Power Development, LLC, Magnum CAES, Mercedes-Benz Energy, National Grid, NEC Energy Solutions, Inc., NextEra Energy Resources, NEXTracker, NGK Insulators, Ltd., NICE America Research, NRG Energy, Inc., OutBack Power Technologies, Parker Hannifin Corporation, Qnovo, Recurrent Energy, RES Americas Inc., Sharp Electronics Corporation, SolarCity, Southwest Generation, Sovereign Energy, Stem, Sunrun, Swell Energy, UniEnergy Technologies, Wellhead Electric, and Younicos. The views expressed in these Comments are those of CESA, and do not necessarily reflect the views of all of the individual CESA member companies. (http://storagealliance.org).

Staff Proposal ("Proposal"). This work on Multiple Use Applications ("MUAs") will enable a better electric system through more affordability from better resource utilization, competition and system efficiency, more reliability by use of modern capabilities, solutions and tools, and through better integration of renewable energy, for which energy storage is uniquely well-situated.

Given the benefits of MUAs, CESA believes it is incumbent on California's governmental agencies, utilities, and other stakeholders to find ways to make MUAs work and to support a broad and robust deployment of MUAs. CESA's comments detail a recommended framework for this approach. CESA also provides responses to questions posed in the Proposal and enhancements to the proposed framework, if that model is ultimately used.

While MUAs certainly represent a change from the electrical grid's historical 'single-use' solutions and tools, CESA emphasizes the need for reasonable and nondiscriminatory approaches that fairly value any non-performance risks attendant to any solutions. It would be inappropriate and potentially discriminatory to MUAs to preclude them for participation unless similar 'outage' concerns are applied to other solutions too. For instance, transmission solutions go on both planned and unplanned (forced) outages, including during periods when reliability can be compromised by these outages. Distribution outages can occur frequently as well, of course, and CESA recognizes that distribution systems are built at times to allow for some failures without outages, *e.g*. to meet 'n-1' conditions. Requisite resiliency is ultimately paid for by ratepayers, and MUAs should therefore be treated the same way as utilities in this regard.

CESA's primary points made here for the Commission's consideration are as follows:

A. CESA's 'Checklist Approach' for authorizing MUAs will work effectively and reasonably for the prudent and reasonable deployment and usage of MUAs.

B. The Proposal's prescriptive approach, if used, needs adjustments.

C. The Commission and CAISO should authorize all forms of performance measurement, not just meters.

D. Station power rules for behind the meter ("BTM") resources should be allowed, but may require some modification.

E. Gaming concerns discussed in the workshop are not applicable.

II. CESA'S 'CHECKLIST APPROACH' FOR AUTHORIZING MUAS WILL WORK EFFECTIVELY AND REASONABLY FOR THE PRUDENT AND REASONABLE DEPLOYMENT AND USAGE OF MUAS

CESA recommends a new approach to the authorization of MUAs. CESA recommends the use of a 'Checklist Approach' in which any MUA that satisfactorily meets a set of requirements or 'checks' is deemed authorized. CESA details these specific checks below. CESA's Checklist Approach provides many benefits. It can broadly authorize MUAs without needing to list or specify configurations in advance, apply risks, where appropriate, to MUA developers to ensure MUAs operate appropriately and meet designated needs, allows for tailored performance measurement systems and integrity of wholesale-retail jurisdiction and cost-recovery rules, and addresses inappropriate double-payment concerns.

In practice, CESA's Checklist Approach may yield similar results in the near-term to the Proposal's recommended approach for authorizing MUAs. CESA believes, however, that the Checklist Approach provides more flexibility to broadly authorize MUAs so long as key principles and checks are reasonably addressed in any MUA. During this period of rapid technological advancement in energy storage technology, CESA believes prescriptive approaches may pose barriers and restrictions to innovation, particularly as it is difficult to foresee all possibilities.

CESA's Checklist Approach is based on key principles to which all parties can likely agree. The Checklist Approach's key principles include the following:

1) Price signals, contracts, market mechanisms, *ex poste* reviews, buy-out provisions, or clawbacks, or other tools can effectively direct an MUA's behavior in most circumstances.
2) Any MUA must reasonably maintain integrity for wholesale vs retail electricity accounting and settlement, Net Energy Metering ("NEM") system accounting, and 'station power' accounting.
3) MUA resources should be appropriately compensated for services or actions which are not already reasonably provided by and accounted for by other grid mechanisms, services, etc.
4) MUA resources should not be able to provide mutually exclusive services from the same increment of capacity or energy in the same time interval.
5) Rules should reasonably accommodate the development and use of MUAs, but performance reviews or other tools should thwart bad actors.
6) Exemptions may exist but the burden of proof to disqualify any MUA on an *ad hoc* basis should be on the utility or the CAISO, subject to the appropriate regulatory review.

These principles lay the ground work for an approach that is broad and adaptive yet lasting and clear. This approach can inform and shape the activities of MUA developers, utilities, and other stakeholders, such as grid operators. Most importantly, this approach allows for widespread pursuit of MUAs while safeguarding against reliability threats as well as bad actors. CESA also provide examples of how several representative MUAs could function under this framework.

The Checklist Approach requires that any MUA address key MUA requirements, *a.k.a.* "checks." So long as those requirements are met, CESA believes it is reasonable for such an

MUA to be developed and to operate. In some cases, some checks in this framework will be affected by ongoing work in other proceedings, including R.14-08-013. For these instances, CESA recommends that any final ruling in this proceeding provide clear direction regarding the needed rules from other proceedings. To illustrate and justify each of the checks in the Checklist Approach, the below sections detail (a) What is being checked, (b) Why the check is important and appropriate, and (c) what ongoing regulatory work, additional rules, or other needs might inform the check?

A. Check Number 1: Does the resource reasonably maintain integrity of wholesale-retail, NEM, and station power accounting?

This check seeks to ensure any MUA configuration has a performance measurement system, associated rules, and or operates so that key electric system accounting rules are preserved. In particular, this check ensures that wholesale-retail activities and NEM activities are accurately tracked and accounted for at appropriate rates. MUAs seeking to employ the Commission's station power rules likewise need performance measurement systems that can accommodate such rules. In some cases, customers may not seek to 'net' or track auxiliary loads, preferring to 'live with' retail load settlement. This too should be allowed.

Importantly, this check does not proscribe that any particular metering systems are needed, only that any MUA's performance measurement system must reasonably preserve integrity for wholesale-retail and NEM accounting. Generally, all performance measurement tools should be authorized to give options to the developer to select the appropriate one. The set of performance measurement solutions includes meters, baselines, and estimation methodologies.

1) *Why is this check important?* This check is important because it signals what performance measurement requirements, *e.g.* metering, could be needed for an MUA. It also ensures activities are not inappropriately accounted for, preserves established accounting and cost-recovery approaches, and authorizes actions to remedy inappropriate accounting. For

instance, an *ex poste* review system could be authorized by the commission to ensure a utility can enforce the check.

2) *What ongoing regulatory work, additional rules, or other needs might inform this check?* CESA believes an array performance measurement arrangements, including metering, estimation, or baseline approaches, can sufficiently address and ensure wholesale-retail and NEM accounting integrity. In the attached Appendix, CESA reviews a few selected metering configurations to assess their effectiveness. CESA also addresses performance measurement further in Section IV, below.

B. Check Number 2: Does the resource seek inappropriate 'double' compensation for actions in a specific timeframe which are mutually exclusive or are already reasonably provided by and accounted for by other grid mechanisms, services, etc. in that time frame.

1) *What is being Checked?* This check prevents resources from being authorized for mutually exclusive services or for receiving inappropriate payments. It is important to recognize that MUAs imply a resource providing services in *two or more jurisdictional areas*. For instance, a resource seeking to provide customer and market services is an MUA. CESA expects rules for providing services *within a single jurisdiction* to address any mutual exclusivity concerns. For instance, the CAISO's market already ensures a resource providing Energy with a unit of capacity cannot also be paid for Spinning Reserve for that capacity. It is important to note that a time-dimension for this check is critical. The time dimension reflects the period in which services are deemed, scheduled, or contracted to be provided, *e.g*. in an hour of the day, but potentially during a month. This time-dimension needs to be recognized to assess when and if double-payments might not be reasonable.

This check thus addresses whether a resource seeks inappropriate (new) payments in two or more jurisdictions. This check may require judgement to review, but the burden of proof to disqualify a MUA should fall on the utility or regulator, rather than requiring justifications from

the developer. For instance, the CAISO's rules established in ESDER 1 pre-emptively authorize proxy demand resources ("PDRs") to participate in its market through an authorization of FERC-approved rules, including a baseline methodology.

2) *Why is this important?* This check is important because resources should not be inappropriately compensated, yet rules should also not preclude the possibility for MUAs to truly provide value in multiple jurisdictional service areas. This check also clarifies that MUA rules do not need to address mutual exclusivity rules *within* a single domain, *e.g.* operating singularly in the wholesale market, or operating only in the customer domain.

This check establishes a time-dimension for MUAs, which is key to evaluating when and where compensation may be appropriate or not. For instance, there may be months where a MUA resource provides needed and contracted for distribution services, yet other months where that contract does not apply, opening up the potential to sell other services.

3) *What ongoing regulatory work, additional rules, or other needs might inform this check?* Work to develop rules for receiving services in particular domains may be informative to this check, including in the timing of delivery periods for services. For instance, Distribution Resources Plans may highlight that the timing for a particular distribution deferral service is defined only for a select month of the year. This information would be critical to assessing the time-dimension of when and if double-payments are not appropriate. Work on transmission planning and service delivery requirements may also be important.

Other work-streams and regulatory proceedings could also inform this check. CESA believes some MUA disclosure requirements could be appropriate for MUAs, if pursuing some services. Regulators, utilities, the CAISO, tariffs, or customer contracts can direct when these disclosures are appropriate. These disclosures could occur during interconnection, new resource implementation processes at the CAISO, or with customers during the contracting.

C. Check Number 3: Do price signals, contracts, market mechanisms, *ex poste* reviews, buy-out provisions, clawbacks, or other tools exist to direct an MUA's behavior in most circumstances?

1) *What is being Checked?* This check ensures a resource has incentives, contracts, or other directives to deliver key services, where appropriate. This check also addresses concerns about 'non-delivery'. Some jurisdictions already have mechanisms and signals for non-delivery, including wholesale market services, Resource Adequacy ("RA"), and customer domain services. For cases where economic signals have not historically been used to direct behavior or performance, *e.g.* with distribution and transmission service, MUAs should still be authorized to provide services, likely with contractual provisions. For instance, in cases where 'generation' is used to provide transmission solutions, such as with Reliability Must-Run contracts or with a Synchronous Condenser operating at a generator's premise, contracts have directed the resource's needed behavior. While CESA fully supports a system where paid-for services are reasonably delivered, CESA also cautions against any application of higher discriminatory thresholds against MUAs that are not applied to 'conventional solutions'.

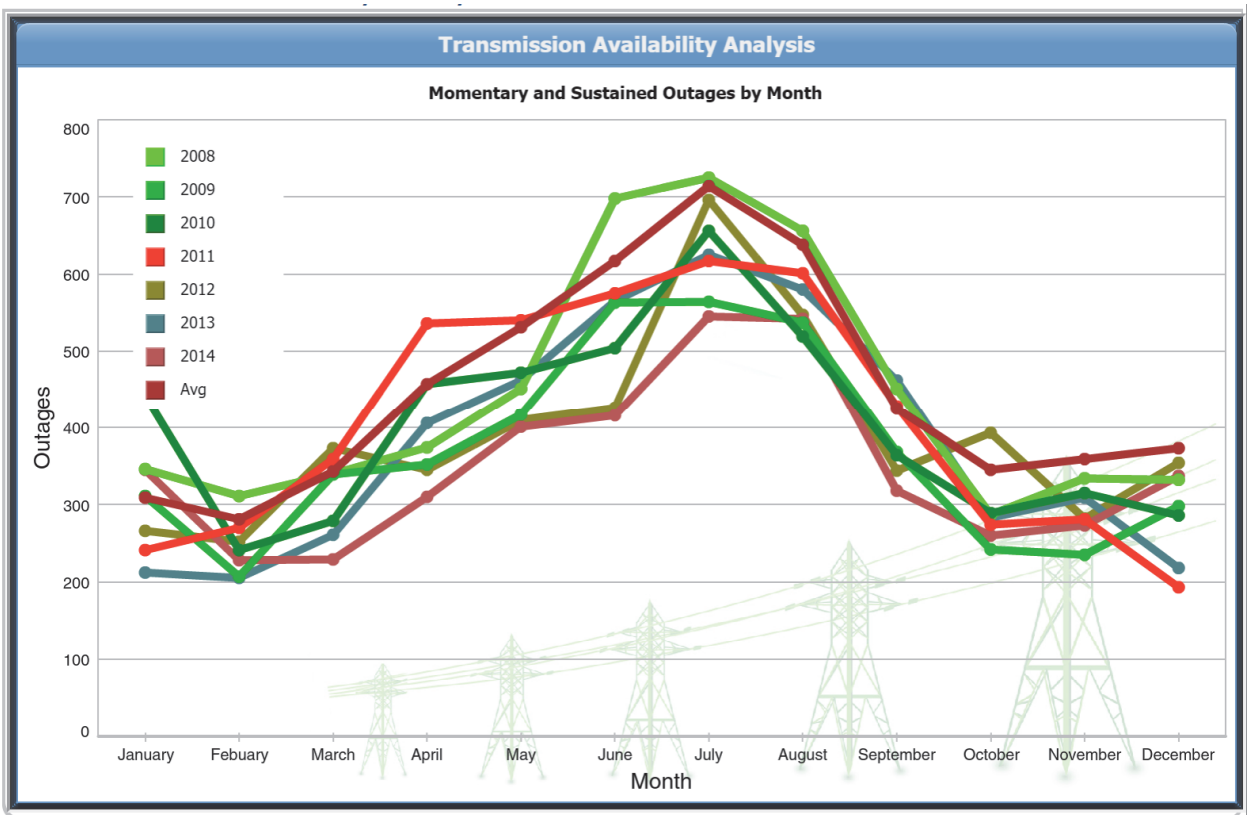
2) *Why is this important?* This check will address reliability concerns and directs more 'marketization' of services. This marketization provides efficiencies, provides price information for certain services, and highlights potential consequences for non-deliveries during key periods. This check also recognizes that other mechanisms can suffice for directing behavior.

CESA observes that different approaches and considerations of 'service delivery or equipment failures' appear to be used in the electric system. On one hand, we see a marketized system in the CAISO's wholesale market. In this case, the wholesale energy market is used to procure the exact amounts of energy needed for any interval, yet a liquid market remains available to buy further energy if non-deliveries occur. This liquid market is further ensured by

our current Capacity Planning approach which directs participation of resources up to 115% of forecast peak loads. Additionally, safeguards in the form of contingency reserves address the potential for non-deliveries.

On the other hand, transmission system operations are conducted without a presumption of a liquid replacement market. This implies that failures to deliver on transmission service could be problematic insofar as no back-up options exist. Grid operators address this failure risk through operational restrictions in which the transmission system is operated with contingency conditions in mind. This allows for failures to occur with presumably limited reliability risks. This approach also requires a more constrained approach to operations which logically increases costs*, i.e.* transmission systems may be built or 'over-built' with the intention of managing this failure risk. To illustrate the point, NERC shows how transmission solutions can be unavailable at times, although no market signals exist to direct the consequences or timing of outages.

Figure 1: Transmission Solutions Can Be Unavailable Too[2]



3) *What ongoing regulatory work, additional rules, or other needs might inform this check?* Work to define, value, and contract for or 'marketize' distribution system benefits are underway in R.14-08-013, and will inform how third party solutions deliver distribution services. Such rules will affect MUAs seeking to provide distribution services. Currently, no rules exist to compensate transmission non-performance and such work may not be needed at this time.

D. Check Number 4: Do other risk factors or barriers such as a need for costly utility IT systems, severe and substantiated reliability concerns, or limitations on addressing bad actors, present such clear and present risks that this MUA should be reviewed further prior to being authorized?

1) *What is being Checked?* This Check is design to identify material barriers or serious risks with the MUA that warrant further caution prior to authorization. CESA recognizes that there may be concerns that haven't been considered yet could very well be raised in the

[2] http://www.nerc.com/pa/RAPA/tads/Pages/TransmissionAvailabilityAnalysis.aspx

future. CESA also understands that there could be preferences for new utility IT systems for MUAs, although CESA remains unclear on the details or potential workarounds for this concept.

2) *Why is this important?* This check is designed to be a safeguard on MUA authorizations. CESA suggests, however, that any check concerns need to be clearly articulated and addressed in a way where this check cannot be used to obstruct progress. For instance, the burden of proof for any this check should fall to the utility or regulatory entity indicating a serious risk or problem could occur. This position must also accord with the Proposal's principles Number 5 and Number 6, which direct a preference for allowing MUAs and using tools to address and eliminate bad actors, rather than to delay or block an MUA due to a perception of a low-frequency bad actors. In the cases where market signals direct behaviors and bad actors 'wear' the consequences of their actions, regulatory oversight and *ex poste* actions are less needed. Timelines for substantiating concerns regarding this check should be short so the check does not inappropriately delay MUAs.

Importantly, this check signals CESA's willingness to consider concerns from other parties and to react reasonably to cost-based objections, e.g. for a new IT system. CESA recognizes that MUAs may create unique circumstances to consider but suggest the best approach for achieving and unlocking MUAs is to authorize them broadly subject to key controls being met.

3) *What ongoing regulatory work, additional rules, or other needs might inform this check?* Regulatory agencies may seek to develop a process for objecting to this check. The burden of proof should be on the utility or other grid controlling entity. CESA strongly urges that the default assumption be to authorize the MUA, rather than to restrict it and to place the burden on a developer to identify a way to appeal for review. Instead, the utilities or entities controlling the systems should be directed to appeal.

III. THE PROPOSAL'S PRESCRIPTIVE APPROACH REQUIRES A NUMBER OF ADJUSTMENTS.

CESA appreciates the serious thought that went into the Proposal, although it uses a questionable binary categorization system of 'reliability' versus 'nonreliability' services. The Proposal also limits where any MUA can pursue, provide, or receive compensation for multiple 'reliability' services. The Proposal relies on sixteen rules or principles which in effect collectively yield a prescriptive set of authorized MUAs.

Fundamentally, CESA supports the many ideas that underpin the Proposal, including the notion that MUAs should not receive inappropriate payments nor should they inordinately threaten reliability. In CESA's "Checklist Approach," however, CESA avoids any listing of authorized MUAs and instead relies on a shorter set of principle-based checks by which to limit MUAs. This approach may yield a similar near-term set of authorized MUAs, but the Checklist Approach seems to place more onus on developers to address key principles and more onus on utilities to defend any concerns, and so does not presumptively limit MUAs. Both approaches contemplate the risks of bad actors and seek to allow recourse to address such concerns. Both approaches recognize a need to account for energy at appropriate rates.

CESA believes the Proposal's approach, if used, should be modified in several ways to allow more broad and flexible authorizations of MUAs. A key goal of CESA's input is to help shape the Proposal to authorize MUAs in a prudent way. Part of this work, importantly, is to direct rules for providing services in multiple domains, but not to prescriptively define rules for participation inside any jurisdictional service area. Such work is often detailed and is developed via rules for participation in that service area. For instance, R.14-08-013 is developing rules for third party resources to participate in the distribution services domain. This proceeding, by contrast, is thus better suited to focus on broad rules for how a third party resource could also broadly contemplate services in multiple domains.

First, the Proposal, should switch multiple services from 'reliability' to the 'non-reliability' categories. This should include:

- Inertia
- Primary Frequency Response
- Blackstart
- All wholesale market services
- All Resource Adequacy.

CESA makes this recommendation for services which have or could soon have market signals for the provision of these signals. The wholesale market services, in particular, have well established signals and consequences for non-delivery. Other services, such as Inertia, Primary Frequency Response, and Black Start, are coupled with generation services and should not be considered reliability transmission services at this time. Currently, these services are provided by generators, and the CAISO is developing rules for their provision via contracts or 'in-market' solutions, such as a potential Primary Frequency Response wholesale market 'product'.

To emphasize the need for these changes, CESA notes that the categorization of some reliability services conflicts with currently active MUAs. A significant number of MUAs authorized as a result of Southern California Edison's Local Capacity Requirement decision (D.15-11-041)[3] were BTM resources providing both customer services and Local Capacity Resource Adequacy ("LCRA"). There is no stipulation regarding which wholesale market services these resources can provide, so long as these resources comply with their must-offer obligations. In fact, many resources may opt to provide LCRA yet seek provide Spin more often

[3] *Decision Approving in Part, Results of Southern California Edison Company Local Capacity Requirements Request for Offers for the Western LA Basin Pursuant to Decisions 13-02-015 and 14-03-004,* issued November 19, 2015.

than imbalance energy, which might be in conflict with the Proposal as written. The Proposal's categorization thus inappropriately limits currently active and effective MUAs.

The Proposal also seems guided by concerns of delivery failure such that CESA recommends a comprehensive assessment and categorization based on the complications of failed service-delivery. In these cases, rules for MUAs should not be discriminatory to MUAs, which should face performance expectations and access rights similar to existing resources. CESA assumes that some of the Proposal's determinations link to whether there is a perception of a deep and liquid replacement market for a particular service or not. For instance, if LCRA is procured to 100% of need, there may be a sense that failure to deliver is more critical than a failure for System RA, for which a 115% procurement target provides a 'buffer' against failures to deliver. For distribution services, meanwhile, there appears to be a perception that no 'back-up' solutions can be used and so failure is more concerning.

This aspect of the Proposal, however, is overly restrictive and duplicative of the safeguards in system planning within each utility service territory. For instance, the transmission system is operated to already accommodate failures, *e.g.* n-1 contingencies, and thus excess restrictions on MUAs are punitive, costly, and unnecessary. Distribution systems are built robustly enough to operate in some instances in spite of equipment failures. While MUAs are likely to be modular and smaller than large fixed infrastructure and thus less impactful to system reliability if failing to deliver, these resources nevertheless warrant similar if not better 'failure' treatment. For instance, if failure is a concern, it may be appropriate to consider a slightly overbuilt MUA against the equally robust distribution solution. This 'failure-delivery understanding' highlights the different planning approaches associated with different jurisdictional service areas, and also how marketized services more transparently price failure. For example, many resources provide LCRA and Flexible Capacity services simultaneously

without undue failure concerns, while also providing wholesale market services again without excess failure concerns. MUAs should be authorized for all of these capabilities without discrimination.

Second, the proposal needs a time-dimension. This dimension is likely implied via some of the rules but explicit definition of a time dimension will prevent overly restrictive rules. For instance, RA obligations are only a month long, and in other months, it may be entirely reasonable to provide a different reliability service. This should not be restricted, and the inclusion of a time dimension, could reasonably allow such flexibility.

Fourth, the rules should not by overly restrict aggregations. CESA recommends inclusion of 'intent language' to clarify that the rules do not intend to limit the use of a fleet to deliver multiple services. In aggregations, the sub-resources may have different MUA services they're directed to address, *e.g.* an algorithm directs which resources are need for demand charge management versus which are still available to provide market services pursuant to a market award. Any rules should accommodate this approach to operations from an aggregation, and should not be prescriptive about what sub-sets of resources are doing in any interval. This again highlights how market signals for the provision of services are helpful in directing behavior and in addressing any service-delivery failures.

Fifth, rules should not overly stipulate the need for physical control of resources by operators. While the proposal signals some flexibility in when and if physical dispatch control of a resource is needed, CESA emphasizes that such flexibility is very important. In many cases, contracts or financial structures alone can satisfactorily direct dispatch needs. Instead of operational control, elucidation on or the development of operational requirements would allow MUAs to provide services while also considering what other services can reasonably be delivered.

Sixth, CESA recommends the Commission and the CAISO consider an approach with three, rather than two, service categories. For instance, the services could be recategorized under three categories based on concerns of service -delivery failure. CESA anticipates the most acute reliability concerns exist where liquid 'back-up' market do not exist (yet these services may often involve overbuilt solutions), and these services could be categorized under the most restrictive in MUA category. By contrast, a 'middle category' could be developed for services critical to reliability yet reasonably replaced or already directed through price signals. An example of a three-column structure is listed below.

Figure 2: Hypothetical Three-Column Categorization Scheme

Category A: **Most Accurate Reliability Services w/o Replacement Market for Service Delivery Failures. (Solutions likely also not 'overbuilt')**	**Category B:** **Services Important for Reliability Yet With More Robust Replacement Markets and Market Signals for Service Delivery**	**Category C:** **Services with Little to No Grid Reliability Effects**
Select Transmission Services	Resource Adequacy Services	Customer services
Select Distribution Services	Wholesale Market Services	
	Select Transmission Services	
	Select Distribution Services	

IV. THE COMMISSION SHOULD AUTHORIZE ALL FORMS OF ALLOWED PERFORMANCE MEASUREMENT FOR MUAS.

Performance measurement is technical and many approaches to performance measurement may be effective. Currently, the main performance measurements systems in the electrical grid include: metering, baselines, estimation, operating/not operating, or not measurement (*a.k.a.* deemed delivered). CESA understands that some resources, such as

distribution equipment are not measured for performance but are deemed operating (or not). In some cases, some services are presumed delivered but not measured.

R.15-03-011 should broadly authorize an array of performance measurement approaches that is reasonable and nondiscriminatory. This will protect for appropriate service delivery but also support the helpful deployment of MUAs. For instance, MUAs should not face unreasonably harsher performance measurement services than other resources providing the same service. Some caution in performance evaluation is appropriate, but that it should not be unduly restrictive.

At the workshop, CESA understood that some performance measurement structures established and enforced in the Wholesale Distribution Access Tariff ("WDAT") are not jurisdictional to the CAISO nor the Commission.[4] In these cases, the Commission should exercise its jurisdictional authority over distribution system investor-owned utilities to direct them to pursue changes needed in their WDAT to reasonably accommodate MUAs.

V. STATION POWER RULES FOR BEHIND THE METER RESOURCES SHOULD BE ALLOWED BUT MAY REQUIRE MODIFICATION.

CESA appreciates the helpful direction and nondiscriminatory rules the Commission currently directs for auxiliary load netting, wholesale rate treatment for charging energy, efficiency losses, and direct operating loads. These rules are broadly referred to as Station Power rules. Further review of these rules can provide key insights which should inform any further Commission decision on MUA authorization.

[4] Powertree Services, for example, mentioned challenges with its WDAT interconnection process, and CAISO staff stated that WDAT interconnection is neither Commission nor CAISO jurisdictional.

First, resources should have the option to take advantage of station power rules, but should not be required to. For instance, a resource that chooses to not measure select auxiliary loads may accept retail settlement for those loads. It should be the resource's choice.

Second, performance measurement systems for the BTM resources may direct when and where select station power rules can apply. These rules are designed to support cost-effective development of resources and also to preserve the integrity of key retail load accounting, including for NEM.

One option would be to exclude BTM non-exporting systems from any wholesale treatment. A non-export system will see all energy consumed by retail loads at some stage or consumed by auxiliaries and losses. While the energy consumed by auxiliaries and losses may be eligible for wholesale treatment when providing wholesale services such as PDR it may be prudent for simplicity to exclude BTM non-exporting energy resources from any wholesale treatment.

Where resources seek to appropriately seek station power treatment, configuration 1 and configuration 2, in the attached Appendix, highlight methods of capturing this through an estimation approach (Configuration 1) or direct metering (Configuration 2).

VI. GAMING CONCERNS RAISED IN THE WORKSHOP ARE NOT APPLICABLE.

During the Workshop, parties discussed whether allowing participation from BTM resources receiving wholesale charging energy could allow gaming. Some of this discussion related to a metering configuration used in an example by CESA. This example is detailed in Appendix, Configuration 1, and involved a discharge to the grid in a time interval at a wholesale settlement. Of course, CESA opposes gaming and believes solutions can be used to reasonably prevent gaming while also still authorizing broad use of MUAs.

A concern was raised at the Workshop that a BTM resource could potentially 'game' the system by looking back after the fact and declaring its past BTM energy storage charging actions as wholesale. Under the hypothetical example, a customer would presumably contemplate this if they saw they ***had*** charged during a period of negative wholesale prices, and so would want exposure to those prices. The bad-actor would then theoretically take actions to make their past charging categorized as 'wholesale.' However, this concern is inapplicable and is not feasible to address in the CAISO's market. If the customer *was* charging during a time of negative prices, it was doing so based on a pre-determined schedule into the wholesale market. For instance, some CAISO market awards are determined a day in advance, where others are determined based on market participation *75 minutes in advance of the operating hour*. Further, market schedules are binding, and any failure to deliver on a schedule will be settled through 'buying back' one's position at wholesale prices in the applicable intervals. The CAISO allows this regularly as they've deemed that non-deliveries should be exposed to the cost-consequences of their actions, *a.k.a.* buying out of their position. This also represents a market philosophy that a clear market price can inform actions. For instance, parties seeing a market scarcity situation in the form of a higher energy price may choose to over-deliver energy to help the system. The CAISO places limits on participants' ability to consistently deviate from schedules, however, through a persistent deviation penalty. All these factors combine to highlight that this gaming concern seems improbable, and that no 'free option' to game exists.

VII. BEHIND THE METER ENERGY STORAGE PARTICIPATION IN BOTH RETAIL AND WHOLESALE MARKETS MAY REQUIRE THE ABILITY TO ENTER AND EXIT THE MARKET AT TIMES.

CESA has recommended that the CAISO amend the non-generator resource ("NGR") model to allow NGRs to be taken out of the market regularly.[5] NGR currently has a 24/7 bidding requirement, such that the resource must always be available to the market. Storage resources that participate in the wholesale market using the NGR model will be metered and settled by the ISO on a 24x7 basis, comparable to a generator. This means that the ISO will receive meter data for all market intervals and will settle all energy consumption and production in the wholesale market settlement, whether or not the NGR submits bids and receives schedules or dispatch instructions in all intervals. It is not possible to operate in the retail domain and wholesale market domain at the same time and therefore the NGR model requiring a resource to always be available and settled for wholesale precludes any retail operation. This requirement makes wholesale and retail operation mutually exclusive and blocks MUAs. CESA recommends allowing NGRs to be taken out of the market on a regular basis.

VIII. CONCLUSION.

CESA appreciates the opportunity to submit these comments on the Proposed Decision and looks forward to working with the Commission and stakeholders in this proceeding.

Respectfully submitted,

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DOUGLASS & LIDDELL

Counsel for the
CALIFORNIA ENERGY STORAGE ALLIANCE

Date: June 16, 2017

[5] Staff Proposal, p. 23

APPENDIX

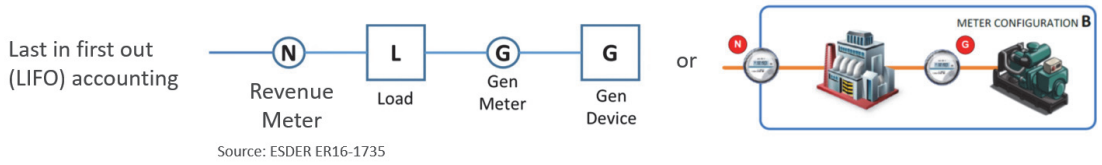
CESA CHECK-LIST APPROACH EXAMPLES AND METERING STRUCTURE REVIEWS.

The configurations discussed here highlight that it is possible to capture and separate retail and wholesale energy, and how station power rules can be applied. These are not prescribed methods and any arrangement that meets the checklist approach, discussed in the above comments, should be considered.

Configuration 1:

Last in first out (LIFO) accounting to determine wholesale charging utilizing the existing approved MGO metering configuration.

Only when energy is supplied to the grid is a customer eligible for wholesale treatment. It is not possible to know a customer's future performance so only when they meet this requirement is a wholesale settlement activated. An accounting approach to look back and appropriately handle wholesale charging is then taken.



Source: ESDER ER16-1735

Scenario 1	2pm	3pm	4pm	5pm	6pm
Meter N	10	10	-10	-10	5
Meter G	10	10	-10	-10	0
Load	0	0	0	0	5
Wholesale	10	10	-10	-10	0
Retail (N-W)	0	0	0	0	5

Scenario 2	2pm	3pm	4pm	5pm	6pm
Meter N	15	15	0	0	5
Meter G	10	10	-10	-10	0
Load	5	5	10	10	5
Wholesale	0	0	0	0	0
Retail (N-W)	15	15	0	0	5

Scenario 3	2pm	3pm	4pm	5pm	6pm
Meter N	15	15	-5	-5	5
Meter G	10	10	-10	-10	0
Load	5	5	5	5	5
Wholesale	0	10	-5	-5	0
Retail (N-W)	15	5	0	0	5

Scenario 1. At 4pm the customer provides 10kWh to the grid, captured by Meter N. This triggers a 10kWh settlement at the wholesale rate. To capture the charging energy, the most recent charging to this amount of energy is looked for, recorded by meter G and can be seen at 3pm. So the customer is paid for 10kWh at the 4pm rate and pays for 10kWh at 3pm. Likewise, at 5pm another 10kWh discharge to the grid triggers this same process and the look back identifies 2pm is the most recent charging of this energy. The customer pays for 10kWh at 2pm and earns 10kWh at 5pm. There are no retail charges as no retail consumption occurs.

In this scenario, to account for station power rules it may be necessary to apply an efficiency factor. E.g. if the system is proved to be 90% efficient, the look back can allow 11.1kWh of charging to be settled at wholesale to allow the 10kWh discharge.

Scenario 2. The customer never discharges to the grid, meaning they are not eligible for any wholesale treatment. This means all their charging is consumed by retail loads and they pay the retail rate. They only benefit but should they have a lower retail rate during the charging as is appropriate. They pay for the full 35kWh consumed by retail load, at the retail rate (15kWh at 2pm, 15kWh at 3pm and 5kWh at 6pm)

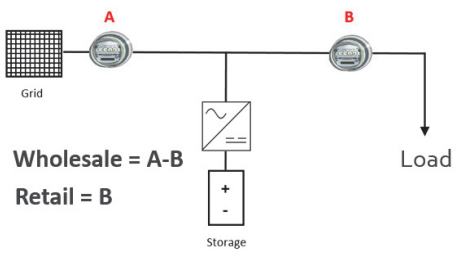
Scenario 3. At 4pm the system provides 5kWh to the grid which is eligible for wholesale payment. This triggers a look back to settle 5kWh from 3pm to be paid for at wholesale to appropriately treat the charging energy. Again at 5pm there is a 5kWh discharge to the grid which again triggers a look back and is again found in the 3pm interval. The customer pays for 10kWh of energy at 3pm and is paid 5kWh of energy at 4pm and 5kWh of energy at 5pm at the relevant wholesale rates. The customer also consumes 25kWh of retail load over the 5 time intervals and pays for 25kWh at the retail rate (15kWh at 2pm, 5kWh at 3pm and 5kWh at 6pm)

Configuration 2:

This is shows it is possible to meter the energy flows to maintain wholesale and retail integrity.

If a customer is participating in the wholesale market, meter A minus meter B captures all energy into the battery and meter B captures all retail load.

	Scenario 1	Charge/Discharge (Good Actor)			
	Meter A	Meter B	A-B=Wholesale	B= Retail	
Time interval 1	10	0	10	0	Pay 10kWh at wholesale rate
Time interval 2	-9	0	-9	0	Earn 9kWh at wholesale rate
	Scenario 2	Default on Discharge (Bad Actor)			
	Meter A	Meter B	A-B=Wholesale	B= Retail	
Time interval 1	10	0	10	0	Pay 10kWh at wholesale rate
Time interval 2	0	9	-9	9	Earn 9kWh at wholesale rate but pay for all 9kWh consumed at retail rate*
	Scenario 3	Split Discharge (Combo)			
	Meter A	Meter B	A-B=Wholesale	B= Retail	
Time interval 1	20	0	20	0	Pay 20kWh at wholesale rate
Time interval 2	-9	9	-18	9	Earn 18kWh at wholesale rate but pay for all 9kWh consumed at retail rate*



* May need to adopt highest TOU price if it can't be distinguished when retail energy was charged.

Scenario 1 (Good actor) This customer charges the battery with 10kWh in time interval 1. Assuming a 90% round trip efficiency they then discharge all 9kWh to the grid in time interval 2. This will see them pay for 10kWh at the wholesale rate in time interval 1 and earn 9kWh in time interval 2. The 1kWh that is lost is paid for at the wholesale, time interval 1 rate as appropriate.

Scenario 2 (Bad actor) This scenario sees the same charging behavior in time interval 1 but in time interval 2 they consume the energy with retail loads rather than export the energy. This results in the reversal of the wholesale payment (9kWh) and the recording of 9kWh of retail usage. They pay for 10kWh at the wholesale rate in time interval 1. They earn 9kWh at the wholesale rate in interval 2 (they are offsetting 9kWh) but pay for the full retail consumption at the retail rate. The 1kWh station power losses are settled at the wholesale rate in interval 1. It

may be appropriate to apply the highest TOU rate for the retail consumption as noted in the figure, if the time that the retail power was charged from the grid cannot be established.

Scenario 3 (Combination) This scenario sees 20kWh of energy charged in interval 1 and in interval 2, half is discharged to the grid (9kWh) and half is consumed by retail loads (9kWh). Again, the customer will pay for 20kWh of energy in time interval one at the wholesale rate and in interval 2 they will get paid 18kWh at the wholesale rate (9kWh to grid and offsetting 9kWh of load) but they will also pay for the 9kWh at the retail rate for the retail consumption. Again, the 2kWh that were lost are settled at wholesale in time interval 1 as appropriate.

An important aspect of this metering set up is it allows wholesale market participation, but utilizing the energy storage for operation in the retail domain is precluded. It should therefore be important that the NGR model to allow NGR resources to be taken out of the market regularly. This will allow this metering setup for wholesale participation but at times the system is not in the wholesale market, it can revert to a true BTM system where the retail meter at point A captures all retail usage and site demand management and TOU arbitrage can be performed.