BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769.	Rulemaking 14-08-013 (Filed August 14, 2014)
And Related Matters.	Application 15-07-002 Application 15-07-003 Application 15-07-006
(NOT CONSOLIDATED)	
In the Matter of the Application of PacifiCorp (U901E) Setting Forth its Distribution Resource Plan Pursuant to Public Utilities Code Section 769.	Application 15-07-005 (Filed July 1, 2015)
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COMMENTS OF THE CALIFORNIA ENERGY STORAGE ALLIANCE ON THE ADMINISTRATIVE LAW JUDGE'S RULING INVITING COMMENTS ON INTEGRATION CAPACITY ANALYSIS METHODOLOGIES, INTEGRATION CAPACITY ANALYSIS WORKSHOP REPORT, LOCATIONAL NET BENEFITS ANALYSIS METHODOLOGY, LOCATIONAL NET BENEFITS ANALYSIS WORKSHOP AND DEMONSTRATION PROJECTS A AND B

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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 Inviting Comments on Integration Capacity Analysis Methodologies, Integration Capacity Analysis Workshop Report, Locational Net Benefits Analysis Methodology, Locational Net Benefits Analysis Workshop Report, and Demonstration Projects A and B*, issued on February 18, 2016 ("Ruling").

I. INTRODUCTION.

CESA supports the Distributed Resource Plans ("DRPs") as an important framework for advancing a more open and transparent electric distribution framework that accurately values all the benefits of energy storage and other distributed energy resources ("DERs"). Each of the investor-owned utilities ("IOUs") have made some progress toward improving the distribution planning process through their proposed Integrated Capacity Analysis ("ICA") and Locational Net Benefits Analysis ("LNBA"), but there are improvements that could be made to the openness, transparency, and granularity of these tools and methodologies. The IOUs indicated in

[1] 1 Energy Systems Inc., Advanced Microgrid Solutions, AES Energy Storage, Aquion Energy, Brookfield, CODA Energy, Consolidated Edison Development, Inc., Cumulus Energy Storage, Customized Energy Solutions, Demand Energy, Dynapower Company, LLC, Eagle Crest Energy Company, East Penn Manufacturing Company, Ecoult, ELSYS Inc., Energy Storage Systems, Inc., Enersys, Enphase Energy, EV Grid, GE Energy Storage, Gordon & Rees, Green Charge Networks, Greensmith Energy, Gridtential Energy, Inc., Hitachi Chemical Co., Ice Energy, IMERGY Power Systems, Innovation Core SEI, Inc. (A Sumitomo Electric Company), Invenergy LLC, K&L Gates, LG Chem Power, Inc., LightSail Energy, Lockheed Martin Advanced Energy Storage LLC, LS Power Development, LLC, Mitsubishi Corporation (Americas), NEC Energy Solutions, Inc., NextEra Energy Resources, NRG Solar LLC, OutBack Power Technologies, Panasonic, Parker Hannifin Corporation, Pathfinder, Powertree Services Inc., Primus Power Corporation, Princeton Power Systems, Recurrent Energy, RES Americas Inc., S&C Electric Company, Saft America Inc., Sharp Electronics Corporation, Skylar Capital Management, SolarCity, Sovereign Energy, Stem, SunEdison, SunPower, Toshiba International Corporation, Trimark Associates, Inc., Trina Energy Storage, Tri-Technic, UniEnergy Technologies, Wellhead Electric, 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).

the February 1, 2016 workshop on LNBA Methodologies and Demonstration Project B that a public LNBA calculation process will not be publicly shared. However, stakeholders should be given greater access to the IOUs' assumptions and methodologies for calculating ICA and LNBA outputs, or at the very least, be provided sample calculations for an example circuit or feeder to allow stakeholders to validate the IOUs' assumptions and methodologies.

Improvements could also be made in the consistency of the IOUs' ICA and LNBA methodologies to provide greater clarity and certainty to DER providers and enable a high-level evaluation of the DRP framework. Southern California Edison Company ("SCE"), for example, proposes a distribution deferral framework for its DRP, whereas Pacific Gas and Electric Company ("PG&E") and San Diego Gas & Electric ("SDG&E") each provide an optimal locations framework that focuses on DERs with the highest LNBA values being solicited for parts of the distribution system with the highest ICA values. While the eventual ICA and LNBA values will differ across the three IOU service territories, the assumptions and methodologies should be largely consistent.

Finally, the IOUs said in the February 1, 2016 workshop that they are focused on reforming its distribution planning process for deferring conventional infrastructure projects, but are not considering how DERs can be deployed beyond this deferral purpose. Therefore, rather than calculating LNBA values across the entire distribution system, the IOUs are limiting its scope to identify "optimal locations" where both the ICA and LNBA values are high. CESA believes, however, that the DRP framework should be expanded to all parts of the distribution system rather than focusing strictly on optimal locations to consider DER alternative solutions. The goal of the ICA and LNBA calculations should be to advance toward a "plug-and-play" future rather than a traditional procurement framework. In addition, greater consideration of

operational and technical capabilities should be given to adjust and more accurately calculate ICA and LNBA values. Low LNBA values at a given location, for example, may be due to the existing DERs deployed in that area.

While getting the ICA and LNBA right is important, CESA views the DRP framework as an iterative process in validating and scaling these tools and methodologies with increased experience, technology advances, and grid conditions changes. In the long term, as the ICA and LNBA tools and methodologies are validated and scaled, CESA hopes that the DRP framework eventually pivots and advances toward building new IOU business models to appropriately incentivize IOUs to consider DERs and align with state energy and environmental goals.

In these comments, CESA responds to select questions posed in the Ruling with detailed and actionable requests and recommendations that the IOUs should be asked implement in their Demonstration A and B Projects.

II. INTEGRATION CAPACITY ANALYSIS.

Question 1: For non-IOU parties, please identify any substantive information from the workshop that is missing from the ICA report.

The ICA Workshop Report does not sufficiently include the workshop discussions surrounding whether and how the ICA values would relate to Rule 21 Interconnection Study Review processes. The workshop discussion did not get into the specifics of how Rule 21 would be developed using the ICA values, but it is important to consider how ICAs can be used to facilitate streamlined and expedited interconnection to make ICAs actionable. In addition, the ICA Workshop Report is missing discussion surrounding the seven Phase 3 functions for smart inverters, which were identified in the highly collaborative Smart Inverter Working Group ("SIWG") in the Interconnection Proceeding (R.11-09-011). These functions were mapped against the various avoided cost categories to ensure that smart inverters were considered as

DER alternatives. Work from the SIWG should continue to be incorporated in the ICA and LNBA calculations in this proceeding.

Question 2: For non-IOU parties, does the workshop report misrepresent any statements made during the workshop?

CESA has no comment at this time.

Question 3: Describe how the ICA can or should be modified to provide information on a less granular basis than the line section level, such as the aggregate integration capacity for an entire feeder or substation.

CESA has no comment at this time.

Question 4: Can the ICA be modified to include more information on single-phase feeders?

CESA has no comment at this time.

Question 5: Describe how the ICA can be modified to reflect load modification strategies such as demand response and efficiency combined with generation or storage. What assumptions should the utilities make regarding the operations of dispatchable DERs (e.g., storage and demand response)?

The ICAs can be modified to better reflect load-modifying resources such as energy storage, and the ICA Workshop Report acknowledges these shortcomings of its current ICA results – i.e., the ICA does not currently consider reverse power flows, which the IOUs indicate will be considered in their demonstration projects.[2] The IOUs also said during the February 1, 2016 workshop that their DRPs are focused more broadly on procuring DER services to meet distribution deferral needs and on improving the processes for procurement.

Modifications to the ICA are therefore needed as to how load-modifying resources such as energy storage can increase integration capacity and mitigate concerns on specific circuits. Improvements to the ICA to account for such resources should begin with the publishing the ICA

[2] ICA Workshop Report, p. 4.

results of both the load and generation limits considering resources such as energy storage can affect both the load and supply forecasts that go into the ICA calculations. Only PG&E and SCE include both a generation and load integration capacity value, while SDG&E indicates that it will include both in future iterations of the ICA.[3] But, the ICA results should not publish the thermal, voltage, protection, and safety limits as a constraint for DER interconnection but rather as a variable that can be affected and increased with the interconnection of load-modifying resources such as energy storage.

In order to signal actionable integration capacity to DER providers, the IOUs could also calculate and indicate the number and capacity of DER systems that any particular line or circuit can host while minimizing the impact on the distribution grid. The IOUs would benefit from conducting an *ex ante* calculation of how ICA results would be affected by interconnecting load-modifying resources such as energy storage and relieve the IOUs from further interpretation and *ex post* calculations of how various load-modifying resources would affect integration capacity. Presenting the ICA results in such a way would also simplify the ICA results for DER providers in quickly deploying their systems to meet identified distribution needs. Fundamentally, the IOUs should be presenting the ICAs in terms of maximizing the value that can be extracted from any given line or circuit by interconnecting DERs, rather than looking at the incremental distribution grid need, as suggested by the IOUs in the February 1, 2016 workshop.

Demonstration Projects A and B should therefore test and evaluate an "advanced" hosting capacity test case where "full deployment" of load-modifying resources such as energy storage can increase the thermal, voltage, protection, and safety limits of various lines and circuits across the distribution system. A benchmark comparison of this advanced test case with a "business-as-

[3] ICA Workshop Report, pp. 7, 10.

usual" hosting capacity case where thermal, voltage, protection, and safety limits of lines and circuits across the distribution system are treated as "hard" constraints will clarify the value of load-modifying resources in increasing integration capacity. The ability to increase integration capacity should be reflected or valued in some way in the LNBA results as well. By allowing for more DER resources to interconnect, load-modifying resources would enable greater deferral of distribution system upgrades in addition to the number of other avoided costs and emissions provided by DER systems.

Question 6: Should the IOUs provide more information on the type and timing of the thermal, voltage, reactance, or protection limits that are responsible for limiting capacity hosting capacity on each line? If so, what information specifically should the IOUs provide and in what format?

CESA requests that information on what is causing constraints be shared to the DER community in order to better provide solutions that actually meet the identified need. The IOUs explain that thermal, voltage, reactance, and protection thresholds were used to determine the hosting capacity on each node or line section. The IOUs add that dynamic time series hourly profiles will be used in the future to reflect the temporal variations of these limits, but cannot currently do so due to "processing requirements." CESA believes that this temporal granularity is important as ancillary services, energy, and capacity being provided also varies across time. The timing of thermal constraints is important to place greater value on DERs that provide relief during times of greatest need on the distribution system. There is also a larger question of how DER deployment timelines affect the ICA calculations. For example, it is unclear how changes in DER deployment and load growth will affect the integration capacity for any given line or circuit for DER interconnections in the queue. The IOUs indicate that monthly ICA updates are too frequent, but this raises the concern of manual circuit-by-circuit of the current ICA. Faster processes and greater automation is needed.

Specifically, CESA includes the list of types of information below that should be shared publicly that will support the DER community in understanding the drivers of distribution system needs and offer the best available DER solutions in actually meeting those needs:

- **Circuit models** to understand how DER solutions could address identified needs
- **Feeder-level loading and voltage data** (annual or monthly, 15-minute or hourly, minimum and maximum values) to perform steady-state integrated capacity analysis and allocate loading along different circuits
- **Customer type breakdown** for each circuit node to estimate typical load curves
- **Existing DER capacity** for each circuit node to incorporate into hosting analysis

III. LOCATIONAL NET BENEFITS ANALYSIS.

Question 1: How should the IOUs determine the cost of capacity upgrades that could be deferred by DERs for use in the LNBA? Do illustrative values or ranges need to be used in publicly-reported LNBA results to protect confidential or sensitive information?

The cost of capacity upgrades to be deferred by DERs could be derived from requests for authorization for traditional distribution upgrades in the most recent and/or current general rate cases for each IOU. In addition, CESA supports the inclusion of illustrative values or ranges in publicly-reported LNBA results to protect confidential or sensitive information, but CESA requests further information as to what types of data will be protected and justifications for protecting specific data.

***Question 2*: Can DERs defer (or avoid) the need for power-quality (e.g., voltage support or frequency regulation) or reliability related distribution equipment in addition to capacity related distribution equipment? If so, provide an exhaustive list of this equipment and explain how the potential deferral of need should be valued in the LNBA.**

DER solutions such as smart inverters, microgrids, and energy storage absolutely have the right to defer or avoid the need for distribution equipment providing power quality and reliability. Variations in voltage and frequency, low power factors, harmonics, and short-run interruptions in service can all be addressed with energy storage devices, which are flexible enough to provide capacity and other distribution services as well. CESA requests that the deferral value for voltage regulators, load tap changers, capacitors, VAR compensators, synchronous condensers, and distribution automation programs be provided be included in the LNBA analysis. Similar to CESA's response to Question 1, above, the deferral value of power quality and reliability related distribution equipment should be drawn from recent and/or current General Rate Case filings.

***Question 3*: What, if any, other local power-quality, reliability, avoided maintenance, conservation voltage, or other values can DERs provide that are not dependent on deferred equipment? How should those values be quantified and included in the LNBA?**

There are a number of other values that DERs can provide that are not dependent on deferred equipment. The IOUs expand upon the avoided cost categories from the Distributed Energy Resource Avoided Cost Calculator ("DERAC"), developed by Energy and Environmental Economics ("E3"). Per the Guidance provided on February 6, 2015, the IOUs used the DERAC as a baseline but then added renewables integration costs, societal avoided costs, and public safety avoided costs. However, there are some avoided cost categories and benefits not covered consistently across the three IOUs. Operations and maintenance expenses related to existing distribution infrastructure can be reduced by deploying DER solutions to

extend equipment life and improve voltage management and power factors, but this value was only included in PG&E's LNBA calculation. Furthermore, flexible resource adequacy ("RA") procurement is also only included in PG&E's LNBA value components, which should be included in all IOU methodologies considering the current and future high ramping needs required of the system. These values can be derived from flexible RA capacity contracts.

Finally, while system-wide avoided costs will be addressed in the Integrated Distributed Energy Resources ("IDER") proceeding (R.14-10-003) that is occurring in parallel with this proceeding, these benefits must be linked with and integrated into the LNBA at some point. DER solutions can reduce the need for additional transmission infrastructure or centralized generation resources, which should be captured in the fully integrated LNBA value calculation.

Broadly, CESA requests that the IOUs share their methodologies for calculating avoided cost values for each category. Further examination is needed on whether the appropriate assumptions and calculations are being made to fairly value all the benefits of DERs. At the very least, if confidentiality and privacy needs to be protected, sample calculations should be provided to allow stakeholders to review the assumptions and methodologies used.

<u>Question 4</u>: Provide further information on feasibility screens. What factors would determine that DER-enabled deferral of a particular distribution investment is infeasible?

The IOUs propose minimum performance requirements (that are not compensated) and upfront standards to identify "feasible" DERs for distribution deferral. The IOUs explain that technology-neutral feasibility screens (which includes size, timeline for deployment, duration, cycling, and control) will be developed in a collaborative process that evolves over time with experience, technology advancement, and changing grid capabilities. CESA stands strongly against such feasibility screens because of the lack of transparency in establishing the screens

and the lack of independence by the IOUs in assessing the DERs for feasibility. The IOUs add that feasibility screens will be vetted by a Procurement Review Group, but CESA believes that there are better market-based mechanisms to determine feasibility. More importantly, CESA believes that feasibility screens are outside the scope of LNBA calculations because feasibility is a sourcing question and does not represent an avoided cost or some other benefit inherently attributable to DERs. Rather, feasibility is should be addressed in R.14-10-003, where the deployment timing, availability, cost, and other competitive sourcing questions will be addressed.

When considering DERs to meet identified distribution needs, the IOUs should also consider existing, already interconnected DERs that can provide multiple services. As a flexible resource, energy storage can provide multiple-use applications at both the wholesale and distribution levels. There are currently discussions underway and workshops expected in Track 2 of the Energy Storage Rulemaking (R.15-03-011) at the Commission and the Energy Storage and Distributed Energy Resources Initiative at the CAISO to address questions of compensation and dispatch coordination to allow multiple services to be provided to multiple system operators and customers. How such DERs are operated and valued should be accounted for in feasibility screens, which should be addressed in further detail in the IDER proceeding.

<u>Question 5</u>: Explain how the LNBA methodology will take into account the ICA analysis, for example in quantifying the costs of implementing DERs on specific circuits.

The ICA analysis presents hosting capacity for each line and circuit that limits the amount of DERs that can interconnect, but as CESA responded in ICA Question 5, above, DERs can improve integration capacity. Therefore, the incremental increase in ICA values provided by DERs should be quantified in the LNBA. As for the costs of implementing DERs on specific

circuits, high ICA values should indicate no or minimal cost of interconnecting DERs to those lines or circuits. In fact, any DERs that are interconnecting to specific locations on the distribution system below the limits quantified in the ICAs should have no costs associated with interconnection. However, clarity is needed on the meaning of the limits quantified in the ICA, specifically as whether DERs can interconnect even at locations where the limits quantified in the ICAs are exceeded. It is unclear whether that will be allowed at all, or whether DERs interconnecting at those locations will have higher costs reflected in their LNBA value. CESA supports the latter, and if so, seeks clarity on how those costs would be calculated.

Question 6: Identify the locational granularity used to evaluate the costs and benefits described in your approach (i.e., the line, section, feeder, multiple feeders, substation) if the proposal is different from the Guidance Ruling.

CESA has no comment at this time.

Question 7: What, if any, issues not covered by the above questions were raised at the LNBA workshop that should also be addressed?

CESA's primary concern with the IOUs' LNBA methodology is that it is not publicly available to stakeholders for vetting and validation of the assumptions and calculations. CESA is particularly interested in the assumptions for load-modifying resources such as energy storage, which as indicated above, has the potential to provide a number of distribution services while also increasing integration capacity for additional DER interconnections. There was a concern raised in the February 1, 2016 workshop about the risk of publicly sharing information on planned investment costs as potentially setting the starting market price. However, these concerns have no grounding in fact since the market for DER providers is competitive.

IV. DEMONSTRATION PROJECTS A AND B.

Question 1: Are there any specific recommendations for implementing Demonstration Projects A and B differently than proposed by the IOUs? Be specific in describing how different approaches would be implemented.

Each of the IOUs has identified areas in which to conduct the Demonstration Project A to validate the ICA methodologies and tools to be applied across the entire distribution system. As compared to the initial ICA results from their DRP Applications, the IOUs plan to validate their ICA methodologies using dynamic time-series analysis, actual load data or more detailed power flow data. CESA recommends that while every DER scenario cannot be planned for, it should specifically test how integration capacity can increase with increasing levels of load-modifying resources. This value can then be accounted for in the LNBA analysis, as discussed above.

All three IOUs also plan to demonstrate the transmission and distribution capacity investment deferral value and the amount of each service that a DER can provide. The IOUs say that the deferral value is the largest benefit component. CESA, on the other hand, believes that the IOUs are unnecessarily limiting the scope of Demonstration Projects A and B to calculating the deferral value of DERs. This opportunity should be taken to validate a number of other DER values that were included in each IOUs' avoided cost components, such as local RA capacity, local ancillary services, line losses, Renewables Portfolio Standard ("RPS") procurement, renewables integration, and power quality.

Question 2: How should the success of the demonstration projects be evaluated? What metrics should be used?

The success of the demonstration projects should be focused on proving out the ICA and LNBA methodologies, but also should put emphasis on validating the accuracy and quality of the ICA in streamlining interconnection for DERs. In other words, the IOUs should determine whether the ICAs are actionable for safe and speedy interconnection by DER providers in lieu of

the usual Rule 21 interconnection review process. To validate this, a sample of interconnecting DER solutions on lines and circuits with high ICA values should be benchmarked with the standard Rule 21 interconnection studies. The ICA results would be providing actionable information for "plug and play" if safe interconnection with minimal grid impacts is verified by standard Rule 21 interconnection studies for each line and circuit.

The LNBA analysis should also be benchmarked with the valuation and accounting for all the costs and benefits of an actual DER project or system already interconnected to the distribution grid. The LNBA analysis and actual project/system data should converge on similar ranges of values for Demonstration Projects A and B to be successful.

V. CONCLUSION.

CESA appreciates the opportunity to submit these comments on the Ruling and looks forward to working with the Commission, the IOUs, and other parties in this proceeding to advance development and implementation of the DRPs.

Respectfully submitted,

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