Rulemaking	13-09-011
Exhibit No.:	
Witness:	John Goodin

Order Instituting Rulemaking to Enhance the Role of Demand Response in Meeting the State's Resource Planning Needs and Operational Requirements	Rulemaking 13-09-011

REBUTTAL TESTIMONY OF JOHN GOODIN
ON BEHALF OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Enhance the Role of Demand Response in Meeting the State's Resource Planning Needs and Operational Requirements	Rulemaking 13-09-011

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Q. Please state your name and business address.

A. My name is John Goodin. My business address is 250 Outcropping Way, Folsom, California 95630.

Q. By whom and in what capacity are you employed?

A. I am employed in the Market and Infrastructure Policy department for the California Independent System Operator Corporation as the regulatory policy manager.

Q. Did you present opening testimony in this proceeding?

A. Yes, I did.

Q. What is the purpose of your rebuttal testimony in this proceeding?

A. The purpose of my rebuttal testimony is to respond specifically to testimony presented by PG&E, SCE, the Joint DR Parties (EnerNOC, Johnson Controls and Comverge) and CLECA. However, to the extent that other parties raised similar arguments, my responses are applicable to that testimony as well.

I. RESPONSES TO PG&E TESTIMONY

Q. At page 4-2 of his testimony, PG&E witness Kenneth Abreu proposes two sets of characteristics that could be used to determine whether an existing DR program should be categorized as a supply-side resource. What is your response to these characteristics?

A. I do not agree with Mr. Abreu's description of the first set of characteristics, which he describes as those products that the CAISO directly procures. In particular, I am unclear about the meaning of his statement: "This does not apply to DR bid into the CAISO energy markets ..." Mr. Abreu implies that supply-side demand response should be limited to offering only ancillary services in the CAISO market, and not be allowed to offer other valuable services such as day-ahead energy, residual unit commitment capacity, ramping capacity (a future product) or real-time imbalance energy. If this is in fact what PG&E is inferring, then the CAISO would oppose such limitations on supply resource market participation and consider such an imposition (1) to be unduly discriminatory and (2) constitute an unwarranted and unsupported restriction on market participation.

Q. Using the supply-side characteristics he identifies, Mr. Abreu then goes on to state that none of PG&E's existing DR programs, or subsets of these programs, should be classified as supply-side resources. Do you agree?

A. No, I do not. Mr. Abreu is proposing the aforementioned narrow and overly restrictive definition discussed above, and is relying on this restrictive definition to imply that none of PG&E's existing programs are configured to offer ancillary services into the ISO market. I believe that this restrictive "ancillary services" only qualification is arbitrary and should not be used to determine whether existing demand response

programs can be bid into the CAISO market. Supply-side demand response resources should not be discriminated against and, if these resources are properly configured, then they should be allowed to take advantage of all wholesale market opportunities. For example, certain existing PG&E demand response programs could very likely be configured to participate in the day-ahead energy market.

Q. At page A-5 of his testimony, PG&E witness Alex Papalexopoulos testifies that the CAISO's market architecture creates high cost for supply-side demand response participation. Do you agree?

A. No. Dr. Papalexopoulos infers that the sophistication and complexity of widely accepted and adopted security constrained unit commitment and economic dispatch techniques equate to market participation complexity. This is incorrect. Market participation by supply-side demand response resources can be as simple as submitting a day-ahead bid and then curtailing those loads associated with the cleared bid the following day.

Additionally, PG&E already performs a forecast by hour and by sub-LAP for their demand response programs. Dr. Papalexopoulos fails to explain why PG&E cannot employ these same forecast techniques to create a bid in the day-ahead market for a supply-side demand resource. Additionally, PG&E bids and schedules generating resources into the CAISO market today. Dr. Papalexopoulos provides no evidence why PG&E cannot leverage a vast majority of its experienced wholesale market staff and resources to participate supply-side demand response resources in the CAISO market since supply-side demand response resources are modeled, optimized and dispatched as a generating resource in the CAISO market. PG&E must also explain what parts of its retail demand response settlement process, including baseline calculations, can be

leveraged for wholesale market settlements especially given that the ISO baseline was intentionally designed to align with the retail baseline settlement method employed by the IOUs. The Commission should request further information from PG&E about how its existing wholesale market systems and staff can be leveraged to bid supply-side demand response resources in the CAISO market.

Q. Dr. Papalexopoulos goes on to state that DR participation in the CAISO market requires much customer interaction, foresight and training, which many customers are not willing to do. What is your response to this argument?

A. I do not believe this is an accurate characterization of required customer participation. This testimony essentially looks backwards and views demand response participation through the lens of current retail demand response participation where customers are essentially their own "demand response provider," individually responsible for their own load curtailment actions and performance This perspective leads to a misinformed vision of how aggregated supply-side demand resources will work in the wholesale market.

In the wholesale market, demand response providers, not retail customers, working as or through a scheduling coordinator will bid aggregated demand response resources into the CAISO market. The demand response provider has the relationship with the ISO, not the retail customers that are participating in the demand response provider's program. Under the supply-side model, an individual customer could very likely have no knowledge that its load reduction is actually part of a larger wholesale supply-side demand response resource.

Thus, contrary to what Dr. Papalexopoulos states, customers only need to know and do what they do today under a retail demand response program. In fact, it is quite

possible that customers, like today, will simply be enrolled in a retail demand response program that PG&E offers, and PG&E, as the demand response provider, will then aggregate and offer the load response of the underlying retail customers into the CAISO market as a supply-side resource. The sophistication and knowledge is rightly the responsibility of the wholesale market participant, which is the demand response provider, not the retail customer. Contrary to Dr. Papalexopoulos' statement, the utility-customer relationship can remain unchanged from the way it is today.

Q. How do you know that demand response customers are not required to have the level of sophistication and knowledge described by Dr. Papalexopoulos?

A. I have based my conclusions on the information provided by third-party demand response providers. For example, I have attached several screen shots from the Page website as Exhibit A to this testimony. [1] As EnerNOC states on its website : "We know you have a business to run, so we focus on making participation in demand response as simple as possible. ."

Elsewhere on the website EnerNoC states: "EnerNOC assumes all risk of non-performance. If your facility underperforms, your payment for the month may be reduced, but you will never have to pay a penalty." Additionally, EnerNOC states, "When you enroll with EnerNOC, you will be protected from any utility penalties for non-performance, get access to your real-time energy data with our intelligence software, receive dispatch forecasting and coaching, and get expert help in establishing your Firm Service Level (FSL) energy reduction nomination to maximize your incentive payments." EnerNOC clearly recognizes that it is the role of the demand response provider to manage

[1] Found here: http://www.enernoc.com/our-resources/brochures-faq/faq-pge-bip-faq. and here: http://www.enernoc.com/for-businesses/demandsmart/how -it-works

individual customer performance risk and the complexities of managing demand response resources. Individual customers need not worry about the details and complexities, or behave radically differently than they do today. They do not have to have "considerable foresight, sophistication, and knowledge" to be part of a supply-side demand response resource. Dr. Papalexopoulos appears to misunderstand the unique role of the demand response provider and the unique opportunity it presents to serve customers while providing valuable wholesale market services.

Q. Do you agree with Dr. Papalexopoulos that the supplier certification process poses challenges for supply-side DR seeking to participate in the wholesale and ancillary services market? (Papalexopoulos testimony, A-16-17)

A. Dr. Papalexopoulos rightly states that the accuracy of the ancillary service certification process has direct impacts on power system reliability. I agree that one size does not fit all—not all demand response is well suited to offer ancillary services, just as all conventional resources are not. The rules and requirements for ancillary services are linked to specific reliability standards. If a supply-side resource can satisfy the requirements of that ancillary service, then it is welcome to provide it. If it is not, there are other market opportunities available to consider, including day-ahead energy and imbalance energy. However, the CAISO's objective is not to try and fit square pegs into round holes, especially when it comes to satisfying critical and mandatory reliability standards. If the risks of ancillary service provision are too high or too costly, then that supply resource is likely not a good candidate for providing that particular service. CAISO witness Jeremy Laundergan provides additional testimony on this topic.

Q. PG&E witness Spence Gerber's testimony generally states that many of PG&E's existing DR programs are a poor fit with the CAISO's market and bidding rules,

making market integration complex and costly without rule changes. What is your response to this premise?

A. The CAISO does not dispute that some of PG&E's existing programs will not be easily integrated into the market as supply-side resources. This should not be viewed as a matter that must be addressed solely through CAISO rule changes. As Mr. Laundergan discusses in his testimony, the CAISO is willing to consider changes to its rules to address certain concerns raised by PG&E and other parties. However, on a going forward basis, changes must also be made to existing programs to facilitate market integration. Without such modifications, it will be difficult to expand the participation and usefulness of DR to meet the goals of the loading order.

Q. Mr. Gerber also questions the CAISO's registration process that requires specific resource locations within a sub-LAP (page B-3-4). What is your response to these concerns?

A. Mr. Laundergran also addresses this issue, but it is important for the Commission and parties to understand why individual service accounts must be registered, and that it represents a reasonable safeguard against gaming and account duplication. In establishing the ISO's demand response products, ISO market participants agreed that registration of service accounts was a sound and necessary practice. The intent of registering individual service accounts is to ensure that a service account is not enrolled with two separate demand response providers, thereby inflating recorded megawatt savings and payments. Registration is a way to prevent this problem and provide a way to audit and identify what service accounts belong to what demand response provider. It is a prudent and reasonable requirement, while acknowledging that the ease of the registration process can continue to evolve and improve.

Q. Mr. Gerber suggests that the CAISO should change the method for reporting outages and that the PDR rules should be changed to permit partial DR de-rates. Do you agree?

A. While Mr. Gerber's testimony on this point sounds reasonable, the Commission should be aware that derates can easily lead to gaming. For example, a supply-side resource could incorporate a number of known low performing end-users to inflate the resource adequacy value of the supply-side resource, whereas in actual operation, only the known high performing customers are relied upon to respond to dispatches; the low-performers are purposely "derated" out of the resource so that the demand response provider doesn't incur performance risk, but is compensated for a high RA value. I would note that the challenge of how to accommodate derates is not insurmountable and may be addressed though disincentives and rules, but the rule around derating a resource, as explained, exists for a good reason. The Commission needs to vet all aspects of raised "concerns" before accepting such points at face value and without considering other potential and unintended consequences.

Q. Dr. Papalexopoulos states that load-modifying DR directly contributes to price formation in the CAISO, even if it is not bid into the market (see Q.8, starting at page A-6). Do you agree?

A. The ISO fully agrees with Dr. Papalexopoulos that load modifying demand response can contribute to price formation- indirectly. Frankly, any energy injection or withdrawal, no matter the source, can have an impact on price formation in the wholesale market. The rising sun increases the output of rooftop solar PV, which impacts prices. There are many different types of load modifying actions that take place on the grid that have price formation impacts. However, Dr. Papalexopoulos seems to imply that load

modifying demand response will have unique, consistent, and favorable price impacts on the market. However, his conclusion hinges on a key premise -- that load modifying DR is "properly used." He is correct only to the extent that if "properly used" and with foresight can load modifying actions guarantee favorable price impacts. Price impacts could be negative, if for example load reductions occurred during a period of over-generation and occur out of sync with system needs.

Interestingly, Dr. Papalexopoulos takes pains to explain the sophistication and complexity of the CAISO market stating, for instance, that "[t]he security constrained unit commitment and economic dispatch processes are complex processes that take into account economic and technical information about the generation fleet and the transmission grid, including system, resource and transmission constraints." [2] It is true that the CAISO runs a sophisticated set of systems and calculations to ensure a feasible and least cost dispatch, while respecting the modeled parameters of resources to maintain reliability in the balancing authority area. What Dr. Papalexopoulos' testimony fails to address are the market consequences and or inefficiencies that result from having "supply-like" dispatchable resources participate outside of this feasible, least cost dispatch process. Load modifying actions will not align consistently with grid operating needs because the load modifying actions will not be considered in the ISO optimization solution, nor will they directly contribute to price formation in the ISO market. While load modifying actions can have system benefits, Dr. Papalexopoulos' claim that the market and price formation benefits of load modifying demand response are the same as supply-side demand response is incorrect and unsubstantiated

[2] *See* page A-4, lines 17-20.

Q. Do you agree with Dr. Papalexopoulos' testimony that load modifying DR impacts CAISO Forecast of CAISO Demand (CFCD) and therefore can be used to adjust CAISO ancillary service requirements?

A. No, this is not correct. Current demand response programs only impact the ISO's residual commitment process in the day-ahead market; they are not used to adjust the CFCD for running the day-ahead market and setting the ISO's ancillary service requirements. They are only considered in the adjustment of the RUC procurement target. Thus, load modifying DR that remains outside the ISO market will not be used to reduce the ISO's ancillary service procurement.

II. RESPONSE TO SCE TESTIMONY

Q. SCE states that it expects to begin bidding DR directly into the CAISO market in July 2014 (see, *e.g.*, page 21). Can you provide additional information as to how the CAISO is working with SCE and others to accomplish this task?

A. Yes, I can. Despite diligent efforts, we currently expect only a small amount of DR will be integrated into the CAISO market this summer due to certain issues that have been uncovered through our integration experience with SCE and others. The CAISO expects to learn much from the programs that are able to be integrated though, and we expect that this process will provide the CAISO and participants the opportunity to learn and make system and process adjustments. The CAISO continues to work with SCE, PG&E, Olivine and other stakeholders to identify and resolve integration issues in order to be prepared for full-scale demand response integration prior to the summer of 2015. The CAISO appreciates the work done by SCE, PG&E, and Olivine. This effort represents an important positive step forward for supply-side demand response

integration and provides confidence that demand response can be successfully integrated into the CAISO market.

Q. SCE has testified that the need for supply-side DR forecasting improvements cannot be determined at this time until there is more experience with bidding in the CAISO market, starting this summer. Do you agree with SCE on this point?

A. Yes. The conclusion that I reach, based on SCE's testimony, is that so long as these resources remain outside the CAISO market, with no financial consequences, DR forecasts may not be as "refined" or as accurate as they could or ought to be given their intended purpose to reduce resource commitments.

III. RESPONSE TO THE TESTIMONY OF ENERNOC, COMVERGE AND JOHNSON CONTROLS ("JOINT DR PARTIES")

Q. At page 4 of the Joint DR Parties' testimony, in the Executive Summary, the parties address RA concerns and state that the rules that apply to DR resources that participate in the wholesale market and are eligible for an RA capacity payment "have not been settled and may take longer than expected to achieve FERC approval." Is this correct?

A. No. This statement is completely unfounded. The CAISO tariff, and its systems and operations already support supply-side demand response participation. The ISO does not disagree that further integration refinements are needed, especially for programs like A/C cycling that have large numbers of service account registrations; however, demand response is already participating in the CAISO market in a limited way, and the CAISO is working on refinements to further facilitate demand response participation.

Q. The Joint DR Parties go on to state, on the same page, that "a must-offer obligation is not an efficient method of dispatching DR and introduces after-the-fact reasonableness concerns." Do you believe this to be an accurate statement?

A. No. A must offer obligation has nothing to do with how resources are dispatched. Resources are dispatched based on a resource's modeled parameters, location and price. A must offer obligation simply means the requirement that a resource adequacy resource make itself available to the ISO through a schedule or bid.

Q. According to the Joint DR Parties, the utilities should be able to schedule a supply-side resource, not needed for transmission or reliability, to address distribution congestion issues. Are the utilities currently able to do this?

A. Yes, this is a settled matter. The CAISO enables resources to be scheduled "out" in the CAISO's outage management system and, therefore, eligible to address a local issue without impacting the resource's baseline calculation in the CAISO settlement.

Q. The Joint DR Parties conclude, in the Executive Summary, that "DRPs will incur a significant amount of initiation costs to establish the ability to participate in the wholesale market." (see page 4). Is this conclusion supported by the testimony that follows?

A. I don't believe so. The Joint Parties admit that none of them are market participants in the CAISO market (see page 29). Rather, this conclusion seems to be based on a comparison of PJM and CAISO market integration requirements, although it is not clear. Indeed, these parties reserved their opinion about a reasonable range of costs, pending additional information from the IOUs. (see Q. C7). Thus, this statement is speculative and does not add any counter-evidence that prevents the Commission from moving forward with its policy to integrate and increase supply-side demand response in the CAISO market.

Q. The Joint DR Parties state that "resource characteristics" are "in flux" at the CAISO and the Commission (page 5, item 2). What is your response to this conclusion?

A. Joint DR Parties are not specific, and their conclusion does not appear to have support elsewhere in the testimony and therefore it is unclear exactly what resource characteristics the Joint Parties consider to be "in flux." The CAISO recently concluded a stakeholder process regarding flexible capacity needs and requirements, but this issue does not implicate all demand response broadly, or the ability of demand response to offer energy and ancillary services into the CAISO market. Thus, there are no facts or evidence to support the assertion that resource characteristics are "in flux," and demand response is thus frozen in place. As such, no conclusions should be drawn from this vague and unsupported statement by the Joint Parties.

Q. The Joint DR Parties assert that "DR resources should not be required to behave like a generator" but then seem to be concerned with comparability with other resources. Can you provide comments on this "comparability" issue?

A. Yes, I found the Joint DR Parties' testimony quite confusing on this point. After stating that DR resources should not be compared to generators, the Joint Parties then turn around and express concern that the demand response auction mechanism would not have a single price paid for comparable resources (both of these statements are on page 5). From the Joint Parties' testimony, it is unclear what a "comparable resource" is in such circumstances. The parties further opine that DR resource options have not, until recently, *been evaluated on a side-by-side basis with other supply resource options* (page 11), and that the "attributes" of DR resources should be aligned with the compensation provided (page 14) these other supply resources. However, the Joint Parties also

conclude that the attributes that define availability and dispatch requirements will not be "standardized," resulting in a "potentially wide variation in bids" based upon different characteristics (page 6).

My general conclusion from this testimony is that the Joint Parties do not want demand response to be compared to generation, but worry that the attributes that traditionally define demand response availability and dispatch capability will not result in the same compensation for demand response as for generators. These conflicts highlight the need for the Commission to keep a clear and principled perspective on how resource attributes and value often represent two sides of the same coin.

Q. The Joint DR Parties appear to be concerned that energy prices in the CAISO market are low in most hours (page 18), and that these prices are unlikely to rise to a level that will encourage DR participation (page 22). Is this a concern that the Commission should address in this proceeding?

A. No, and the Joint Parties' testimony is contradictory on this point. While the parties seem to be arguing that energy rents are not sufficient to sustain a DR business, they also admit that DR is, primarily, a capacity resource that is not utilized to produce energy across a large number of hours per year (pages 17-18). Thus, even if energy prices went to $250/MWH, which the Joint Parties seem to indicate is a high energy price, it is not clear that even at such high prices the energy rents, and, therefore, revenues would be sufficient to attract customers and sustain a "demand response" business in the first place. Thus, arguments made by the Joint Parties about how energy prices could make or break customer participation appear to be conclusory statements.

Q. The Joint Parties express concern that the DRAM and RA rules will cause the CAISO to dispatch DR in 4 hour blocks rather as needed to meet the needs of the system (page 20). Do you agree?

A. No, I do not. The CAISO will dispatch a DR resource based on its bid and modeled parameters. Just because a resource has 4 hours of availability does not mean that the CAISO's systems will necessarily dispatch the resource for 4 consecutive hours. Only if the resource specifies that it has a minimum run time of 4 hours would the CAISO curtail the resource for 4 hours. The CAISO respects the resource parameters in its masterfile when performing its economic dispatch.

Q. At Q. C6, the Joint Parties state that the requirement to deliver on a sub-LAP basis is one of the main differences between the CAISO's wholesale market design and those of other markets; in particular, PJM. What is your response to this testimony?

A. The Joint Parties have repeatedly claimed that costs of participating in the CAISO market will be higher than PJM because the ISO requires aggregation and dispatch of supply demand response resources on a sub-LAP basis. However, I am perplexed as to why the Joint Parties make this particular cost claim given that, in fact, PJM can mandatorily dispatch demand resources with only a day-ahead notice on a sub-zonal basis, which is analogous to the ISO's sub-LAP. Under current PJM rules, PJM is permitted to dispatch more-granular aggregations of demand response resources in more focused sub-zones so long as PJM establishes the sub-zone at least one day prior to the load management event.[3] Compliance with day-ahead sub-zonal dispatch is mandatory beginning with the upcoming 2014-15 delivery year.

[3] *See* PJM filing at 31 (citing PJM Interconnection, L.L.C., 139 FERC ¶ 61,057

Furthermore, unlike the CAISO where the sub-LAP is pre-determined and stable, PJM's sub-zonal dispatch can be turned on or off with limited notice. This seems like a more onerous and costly regime to operate under than the ISO's sub-LAP aggregation and dispatch requirement, which is known far in advance and is stable. Joint Parties fail to provide sufficient detail and support to substantiate their cost claim, especially given PJM's sub-zonal mandatory dispatch requirement.

Q. The Joint DR Parties also claim that CAISO telemetry costs are higher than those in PJM, and that these costs present a barrier to market participation. Do you agree?

A. No. The Joint DR Parties' claim concerning the costs of telemetry and the barrier telemetry presents continues to confound the CAISO. The CAISO believes that the Joint DR Parties remain misinformed about the CAISO's telemetry requirements, which appear to actually be congruent with the Joint DR Parties' explanation as to why telemetry is needed.

As was communicated in the CAISO's opening comments to the bifurcation decision,[4] the telemetry is only required under the CAISO tariff in limited circumstances: 1) for any resource offering ancillary services; or 2) for demand response resources that are 10 MW or greater, which are considered resources significant enough in size to monitor.

Additionally, the CAISO fully agrees with the Joint DR Parties that the "CAISO does not need to "see" each individual load in real time – a collective view is sufficient." When, in the limited circumstances telemetry is required, the CAISO only needs to see the collective resource's load via telemetry, and not individual loads. Once established,

[4] http://www.caiso.com/Documents/Mar13_2014_CommentsProposedDecision-Bifurcation-DemandResponseR_13-09-011.pdf (at pgs. 6-7)

this communication process occurs automatically machine-to-machine between the CAISO's energy management system and the demand response provider's network operations center's energy management system.

Q. Are the Joint DR Parties' expressed concerns with the CAISO's telemetry requirements consistent with the technology capability that they use in their own businesses and advertise to consumers?

A. Apparently not. Again turning to Exhibit A, the EnerNOC website describes the visibility that EnerNOC has into its customers' performance characteristics. The website provides the following information to customers (emphasis added):

> **At the crossroads of energy**
>
> *When demand response resources are dispatched, the NOC provides the visibility needed to ensure success, both for the businesses and institutions that are reducing usage and for the utility or grid operator that relies on their energy reductions. The NOC combines state-of-the-art dispatch management and energy profiling tools with patented business processes to ensure that EnerNOC consistently delivers its contracted demand response capacity.*
>
> * * *
>
> **Management by exception**
>
> *During a demand response dispatch,* ***NOC operators have real-time visibility into how each individual site is performing. EnerNOC has invested millions of dollars in the tools and infrastructure needed to manage underperforming sites quickly and at scale.*** *As a result, we're able to ensure that customers reach their energy reduction targets and maximize their demand response payment opportunity, while also ensuring utilities get the capacity they rely on.*
>
> * * *
>
> *We install a server at your facility to establish communication with our Network Operations Center (NOC), so we can monitor your energy consumption levels in real time, 24/7.*

Thus, EnerNOC's own website claims that it operates a sophisticated and high investment cost real-time monitoring and communication system that enables EnerNOC to communicate and monitor its customers' real-time energy use and make adjustments as necessary to ensure performance. The CAISO is merely asking that the individual site data, which EnerNOC appears to already possess, be aggregated and shared with the CAISO, when applicable.

Furthermore, the CAISO is unclear why telemetry, which is only needed in limited cases, represents such a significant cost and barrier to EnerNOC given that EnerNOC claims to already collect individual site real-time data and it has already invested and built the underlying data collection infrastructure. The Commission needs to understand whether the costs EnerNOC claims in this hearing are new and incremental, or are already part of the millions of dollars in sunk costs EnerNOC has invested in tools and infrastructure. If these are new costs, EnerNOC must be more precise in what "new" costs are incurred, and their magnitude, to participate in California given the sophisticated real-time systems EnerNOC already operates. EnerNOC fails to provide any specific details to support its position.

Q. The Joint DR Parties express concern with the CAISO's customer registration process, noting that DR resource registrations will not be static for any period of time and that these changes are not easily accommodated by the CAISO process. What is your response to this statement?

A. The Joint DR Parties have not provided sufficient support for this assertion in their testimony. The CAISO's system is built on the same platform and software as MISO and PJM, so it is difficult to understand why customer registration would be more challenging with the CAISO's system and process than those of these other ISOs.

IV. RESPONSES TO CLECA TESTIMONY

Q. CLECA witness Barbara Barkovich recommends that, in setting DR goals, the Commission first determine what services DR should provide (page 4). Do you agree that this is the first step in the process?

A. No, I don't. Indeed, this portion of CLECA's testimony seems to contradict Ms. Barkovich's prior statement that "the Commission's broad goal should be to develop all cost-effective DR, consistent with the loading order," with which I agree. There is no need for the Commission to "assign" and, therefore, restrict the services that demand response can offer by "pre-determining" the services it wants DR to provide. Being consistent with the loading order means reducing California's greenhouse gas emissions by first considering cost-effective preferred resources to serve California's future energy needs. To avoid or defer building conventional fossil-fired generation means that preferred resources must collectively provide sufficient operational capabilities to adequately address identified reliability needs. This means resources that can maintain grid reliability and satisfy all applicable reliability standards through the provision of energy, imbalance energy, ancillary services, ramping and load following, regulation, voltage support, black start, etc. Properly configured demand response may be capable of providing many of these energy services or reducing their need. The services the grid requires to operate reliably are clear and not in dispute. Thus, contrary to CLECA's suggestion, it is unnecessary for the Commission to try and pre-determine and restrict the use and applicability of demand response, which would stifle innovation. The Commission should instead promote and encourage preferred resources, including

demand response, to satisfactorily offset or reduce the need for all energy and capacity services that can be feasibly and technically satisfied by demand response.

Q. Ms. Barkovich expresses concern about the CAISO's requirement that the DRP have an agreement with the LSE before registering a customer location to be served by that DRP (page 10). Can you comment on this concern?

A. Yes. I would note that one of the primary reasons for the LSE/ESP and DRP agreement requirement was to ensure there was agreement about how settlement of monies associated with the default load adjustment would be handled between the parties, when applicable. If the CAISO decides to eliminate the default load adjustment, then this requirement may become moot.

Q. Do you agree with Ms. Barkovich's testimony that the costs of automated demand response may be prohibitive for some large industrial customers (pages 11-12)?

A. No. CLECA's concerns regarding the costs and risks of automation are too generalized and broad, and they must be judged against the claims and benefits proffered by EnerNOC, which publishes the load management capabilities it retains at each of its participating sites. For example, here are other statements from the EnerNOC website (Exhibit A):

> **Empowering automation.**
>
> *The utility dispatch is processed and parsed, and EnerNOC dispatches sites enrolled in the relevant regions. Through our automated systems, sites in our network confirm receipt of the dispatch and begin their energy reduction measures.*
>
> **Remote curtailment.**
>
> *Once a site has confirmed its dispatch notification, EnerNOC can automatically and remotely make adjustments in HVAC settings, lighting, and other demand-generating equipment, as defined by a customer-approved Energy Reduction Plan. Customers'*

Energy Reduction Plans can also include changes in operational behaviors, such as shutting down a manufacturing line or delaying energy-intensive processes. For example, a hotel may opt to delay laundry services until after a demand response window has passed.

The ISO understands that automation and direct load control may not work for certain customers. However, to claim broadly and without providing specific support that automation is a barrier and cost prohibitive appears to be counter to actual facts.

Q. Ms. Barkovich warns that if customers are asked to provide more complex services such as flexibility or regulation, they may require more remuneration, if they can provide the service at all. Is this a matter that the Commission should address in this proceeding?

A. The CAISO does not believe that the Commission's policy is to ensure that all demand response must be configured to provide the full panoply of energy and reliability services, such as operating reserves, flexible ramping, imbalance energy, etc. In fact, if certain types of demand response cannot compete to provide these services, then it is neither a good fit nor a cost-effective candidate to provide these services. The CAISO believes that the Commission's principle of least cost and best fit is a sound policy that should be followed. Saying this, when and where it makes sense, the CAISO encourages the development of demand response that can competitively provide the full suite of energy and reliability services as supply resources given this is within the spirit of the loading order.

Q. Similar to the PG&E witnesses, Ms. Barkovich states that potential demand response customers could be "lost" due to the CAISO's rules for integrating DR into the market (see response to Q.18, page 19). Do you believe that the CAISO's supply-side DR integration rules will cause customers to lose interest in providing demand response?

A. Absolutely not. As I testified above, the CAISO is not trying to "shoehorn" all DR so that it all looks and acts the same, universally, across the board. Rather, the Commission should continue to promote the least cost, best fit principle. There is value in a DR program even if it just reduces day-ahead load requirements. Likewise, there is value to DR that can offer bids into the ancillary service market. The bottom line is that no customer is being coerced to form fit a standard demand response product or design.

Q. In discussing supply-side DR, Ms. Barkovich notes that while DR can be used to provide A/S, there is a problem if they cannot bid discrete amounts (page 24). Do you agree that this is a concern?

A. Other parties have raised this same concern that demand response should be dispatched discretely, i.e. for a pre-determined megawatt amount or "block." However, discrete dispatch is inefficient, and is therefore, only accommodated in limited circumstances, including for very use-limited RDRR, which are allowed to configure discrete resources no larger than 50 MW.

The ISO dispatches resources based on the needs of the grid at that time. As a balancing authority, the ISO is responsible for ensuring grid reliability through the continual dispatch of resources to balance ever changing demand on the system. The goal is to continually balance supply and demand. Because demand does not move discretely, supply likewise cannot move discretely, at least not a significant portion of the supply fleet. If all supply resources were discrete, it would be that much more difficult to balance supply and demand minute by minute and reliably operate the grid if resources only moved in discrete megawatt blocks; load does not move discretely.

Discrete resources also create inefficiency in the market; thus, they must be limited. For instance, if the system requires 50 MW additional supply to balance load, but the only available supply resource is a "discrete" 300 MW resource, then the ISO would have to dispatch 300 MW when it only needs 50 MW. The impact of this "discrete dispatch" is that to get 50 MW of supply the system must now uneconomically back off 250 MW of supply to accommodate this 300 MW resource. These types of uneconomic dispatches have a financial impact and create market inefficiencies. Thus, discrete resources must be very limited in size and number.

Q. Does this conclude your rebuttal testimony?

A. Yes, it does.

EXHIBIT A

EnerNOC website pages

ACCOUNT SUPPORT
BILL MANAGEMENT
SUB-ACCOUNTS
FINANCING EE

HOW MUCH YOU USE
PLAN & PRIORITIZE
IMPLEMENT & MANAGE
MEASURE & VERIFY
FUNDING
REGULATIONS
PRODUCTS & SERVICES

WHEN YOU USE IT
HOW DR WORKS
Getting Started
Being Dispatched
Benefits
IN US
Northeast
Southeast
Mid-Atlantic
Texas
Western Region
IN AUSTRALIA
IN CANADA
IN NEW ZEALAND

BY INDUSTRY

tools and information you need to earn the most amount of money for your participation.

Page 5 at Line 13

We know you have a business to run, so we focus on making participation in demand response as simple as possible. EnerNOC works with you to design a customized energy curtailment plan to reduce non-essential energy use during critical periods of imbalance between electricity supply and demand on the grid. We maximize your curtailment potential while minimizing impact on day-to-day operations. The energy you don't use becomes part of our virtual power plant. The grid draws from it when it needs more capacity—a valuable alternative to starting up a fossil fuel-fired back-up power plant. In exchange for this valuable service, commercial, industrial, and institutional entities just like you get paid for the energy you don't use. Plus, you are also paid year-round just for being on call.

Learn more about getting started, what a dispatch looks like, or the many benefits of demand response.

Get Started (Module)

payments year round just for being on standby, plus additional payments based on actual reductions during a dispatch.

EnerNOC is the world's leading provider of demand response. Our software platform includes robust tools to ensure your energy reduction targets are met, maximizing your payment opportunity.

About the Demand Response Opportunity in PG&E's Base Interruptible Program

EnerNOC demand response provides a no-risk opportunity for commercial, institutional, and industrial organizations in Northern California to earn money and drive energy savings through PG&E's Base Interruptible Program (BIP). Your participation helps maintain reliable and affordable electricity across the region. When you enroll with EnerNOC, you will be protected from any utility penalties for non-performance, get access to your real-time energy data with our intelligence software, receive dispatch forecasting and coaching, and get expert help in establishing your Firm Service Level (FSL) energy reduction nomination to maximize your incentive payments. Page 5 at Line 19

Enrollment is available year round, but you can only disenroll or modify your nomination from November 1 - 30.

Program participants receive recurring payments in return for agreeing to reduce electricity consumption in response to abnormally high electricity demand or grid imbalances. EnerNOC manages your participation from start to finish helping ensure that you receive the highest possible financial rewards.

Fast Facts
Program Area: Pacific Gas & Electric's service territory
Program Period: Year round
Program Hours: 24/7/365
Dispatch Notification: 30 minutes
Dispatch Duration: 4 hours

The enablement process:

Participating in demand response with EnerNOC is a simple, 3-step process

1. Our team works with you to identify your reduction potential and strategy for participation. We outline these reduction measures in a detailed Energy Reduction Plan.
2. We install a server at your facility to establish communication with our Network Operations Center (NOC), so we can monitor your energy consumption levels in real time, 24/7.
3. Next, EnerNOC simulates a demand response dispatch to ensure that you are comfortable with the procedures outlined in your Energy Reduction Plan.

EnerNOC then officially enrolls your facility into the program.

Sample energy reduction strategies:

EnerNOC has extensive experience creating reduction strategies that work within the operational limitations of a wide variety of unique facilities, including food processing and cold storage, manufacturers, food processors, universities, malls, office buildings and more. Common reduction examples include:

- Reduce non-essential lighting
- Modify manufacturing processes
- Adjust HVAC equipment
- Dial back pumps
- Change settings in industrial freezers

Our customers find that many energy-intensive processes can simply be shifted by a few hours to facilitate dispatch participation. Ask us about our experience working with customers like you.

With EnerNOC, you can choose to initiate reductions on your own or EnerNOC can initiate reductions remotely.

During a dispatch:

- Notification: When the PG&E anticipates the need for capacity, it dispatches the EnerNOC demand response network into action. Once a dispatch is called, EnerNOC will send you a notification via email, phone, or SMS informing you that the demand response dispatch will begin.
- Response: At the start of the dispatch, your facility will reduce its electricity usage according to your pre-determined Energy Reduction Plan.
- Support: Before, during, and after a dispatch, EnerNOC's Network Operations Center (NOC) remains in communication with your facility. NOC personnel are available 24/7/365, supporting you to ensure that you achieve the highest levels of performance and payments.

Page 5 at Line 17

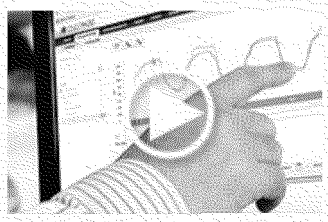
EnerNOC assumes all risk of non-performance. If your facility underperforms, your payment for the month may be reduced, but you will never have to pay a penalty.

ENERNOC
Get More from Energy

'Mission Control' for Energy Management

EnerNOC's Network Operations Center (NOC) connects energy supply and demand and makes demand response and technology-enabled energy efficiency seamless and reliable. Terabytes of data flow into the NOC every year, giving EnerNOC the ability to dispatch demand response capacity where and when it is needed. Staffed 24 hours a day, seven days a week, 365 days a year, the NOC provides unparalleled visibility into each asset in EnerNOC's network, and it connects energy users to their real-time energy data throughout the year.

Inside the NOC
Take a look at our Flickr slideshow highlighting the Network Operations Center.



Unlock the Power of Real-Time Energy Data
Watch our video to see how EnerNOC's software can help you maximize savings and request a demo to learn more.

Global scale, local control

EnerNOC's Network Operations Center is built on a robust backbone to support a global network of approximately 14,000 customer sites. EnerNOC employs redundant data centers in multiple locations to ensure business continuity, and it provides local customer support teams to serve its customers and utility partners throughout the world.

At the crossroads of energy

When demand response resources are dispatched, the NOC provides the visibility needed to ensure success, both for the businesses and institutions that are reducing usage and for the utility or grid operator that relies on their energy reductions. The NOC combines state-of-the-art dispatch management and energy profiling tools with patented business processes to ensure that EnerNOC consistently delivers its contracted demand response capacity.

How does it work?

- **The demand response alert goes out.** Utilities or grid operators send a notification signal to the NOC when demand response capacity is needed, indicating load shed, time, and specific geographies that are needed.
- **Empowering automation.** The utility dispatch is processed and parsed, and EnerNOC dispatches sites enrolled in the relevant regions. Through our automated systems, sites in our network confirm receipt of the dispatch and begin their energy reduction measures.
- **Remote curtailment.** Once a site has confirmed its dispatch notification, EnerNOC can automatically and remotely make adjustments in HVAC settings, lighting, and other demand-generating equipment, as defined by a customer-approved Energy Reduction Plan. Customers' Energy Reduction Plans can also include changes in operational behaviors, such as shutting down a manufacturing line or delaying energy-intensive processes. For example, a hotel may opt to delay laundry services until after a demand response window has passed.

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Management by exception. During a demand response dispatch, NOC operators have real-time visibility into how each individual site is performing. EnerNOC has invested millions of dollars in the tools and infrastructure needed to manage underperforming sites quickly and at scale. As a result, we're able to ensure that customers reach their energy reduction targets and maximize their demand response payment opportunity, while also ensuring utilities get the capacity they rely on.

- **Operations return to normal.** When the demand response dispatch is over, the NOC receives a second signal from the utility or grid operator, automatically notifies participating customers, and restores normal operations at customer sites.

Enabling world-class customer support

The NOC is also the engine behind EnerNOC's world class customer support team, helping customers get the most value from all of EnerNOC's energy management applications. The 24/7/365 Service Desk staff is available for customers to call in with questions. This team handles tens of thousands of calls every year, with an average response time of three seconds. The Service Desk supports every customer enablement, ensuring high standards of quality for each new site and meter that is configured in our systems, while the Network Systems team monitors connectivity at the thousands of EnerNOC Site Servers worldwide, ensuring maximum uptime for our devices.