Comments of Powerex Corp. on
Resource Adequacy Enhancements Revised Straw Proposal

Submitted by	Company	Date Submitted
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Powerex appreciates the opportunity to submit comments on CAISO's July 1, 2019 Resource Adequacy Enhancements Revised Straw Proposal ("Revised Straw Proposal").

Powerex commends CAISO's continued commitment and current efforts to identify and implement targeted improvements to California's Resource Adequacy program towards the objective of enabling the CAISO to maintain reliability under a full range of operational conditions. In particular, Powerex supports CAISO's proposal to implement an unforced capacity ("UCAP") methodology to address perhaps the single largest gap in the existing RA program: the failure to properly account for resource forced outages. This gap has resulted in the quantity of Resource Adequacy resources actually available to CAISO falling short of system needs by several thousand MWs during critical periods.

Powerex's comments instead focus on additional enhancements that have the potential to increase California's ability to obtain reliable forward commitments of physical resources located outside of the CAISO balancing authority area ("BAA"). External physical resource capacity that is surplus to the needs of the respective source BAA—particularly capacity from non-emitting storage hydro resources operated by various entities in the northwest—has the potential to be a cost-effective and highly reliable source for meeting a key portion of California's Resource Adequacy needs, particularly as the state's own resource mix changes. Unlocking the potential benefits of this surplus capacity and flexibility will require CAISO and the California Public Utilities Commission ("CPUC") to work together to strengthen California's forward procurement framework to:

1) allow California to more effectively compete to obtain forward commitments of the surplus capacity and flexibility of external resources,
2) while simultaneously tightening program requirements to ensure that all import Resource Adequacy contracts counted towards meeting System Resource Adequacy requirements can be counted upon to deliver when called upon by the CAISO.

The CAISO and the California Public Utilities Commission ("CPUC") are at a critical juncture as it relates to the participation of external resources in the state's System Resource Adequacy program, as the CAISO resource mix transitions towards greater reliance on renewable resources while internal fossil fuel resources continue to retire. Powerex believes that this CAISO stakeholder process, coupled with the CPUC's integrated resource planning proceeding, presents a significant opportunity for the CAISO, CPUC and stakeholders to work together to implement rules governing import Resource Adequacy that ensure a robust and competitive market for real physical capacity that can be reliably delivered on firm transmission to the CAISO grid, including during stressed grid and market conditions. Failure to take sufficient action at the present time to

tighten the rules applicable to import Resource Adequacy resources to exclude "paper capacity" from speculative and non-firm suppliers, in contrast, has the potential to lead to significant adverse consequences for California ratepayers in the years ahead:

- *First*, those suppliers that are able to avoid the cost of investing in the physical capability and transmission necessary to perform by providing "paper capacity" will be positioned to increasingly crowd out real physical supply. This will lead bona fide physical suppliers—those capable of supporting their forward commitments with real physical capacity and transmission investments—to sales in other markets, increasingly selling their surplus capacity and flexibility on a longer-term forward basis to other load serving entities ("LSE") in the west, particularly to those that similarly find themselves increasingly short on capacity due to the changing resource mixes on their systems.

- *Second*, CAISO's day-ahead and real-time energy markets will more frequently experience price spikes during critical conditions, as the sellers of "paper capacity" either submit energy offers at or near the price cap (to avoid being dispatched in the day-ahead market) or increasingly fail to deliver when they are dispatched.

- *Third*, California ratepayers will bear the costs of "paper capacity" that provides little to no reliability benefits in terms of maintaining the reliability of the CAISO grid.

- *Fourth*, the inclusion of "paper capacity" may present a material barrier to the development of an extended day-ahead market ("EDAM"), as CAISO will be unable to credibly pass a day-ahead resource sufficiency test given the inclusion of this paper capacity in its supply. It also will make participation in an EDAM challenging for other entities in the west, given that an EDAM's centralized unit commitment processes would make the reliability of their own systems dependent on real physical supply being available from other BAAs in the EDAM footprint, including the CAISO BAA.

It is critically important that the CAISO and CPUC address the issues related to import Resource Adequacy in a manner that achieves key reliability objectives, and not be swayed by the arguments of those that benefit from, and wish to maintain, the status quo. While certain sellers of "paper capacity" and LSEs may reap substantial profits or savings by foregoing investments in the forward capacity and firm transmission rights necessary to maintain reliability, the result is to force California ratepayers to bear the costs of contracts that fail to provide key reliability benefits. The arguments being presented by these entities represent nothing more than a transparent attempt to rationalize the shortcomings of a "paper capacity" product. There simply is no merit to the arguments that requiring confirmation that import Resource Adequacy contracts are backed by (1) physical capacity, (2) firm transmission, and (3) operating reserves through upfront verification and ongoing demonstrations is either unnecessary or inefficient. To the contrary, each of these requirements is necessary to ensure that import Resource Adequacy contracts are backed by the physical capability and firm energy delivery capability necessary to meet California's reliability needs with a high degree of confidence.

In the following sections, Powerex provides greater detail regarding the measures that the CAISO, in cooperation with the CPUC, should take to strengthen California's forward procurement framework and prevent speculative and non-firm supply from counting towards meeting California's Resource Adequacy requirements. Such measures fall into two broad categories:

1. Long-Term Forward Procurement. Procuring import Resource Adequacy capacity as a six-month seasonal product, on at least a year-ahead basis, is critical to ensuring California's forward procurement mechanisms are able to obtain needed capacity from external resources, as California increasingly competes with similar forward commercial activity in the bilateral markets outside of California. These same requirements should apply to CAISO's Capacity Procurement Mechanism ("CPM"), and/or any new backstop framework, to enable CAISO (or any new backstop entity) to effectively backstop shortfalls in procurement by California LSEs.

2. Resource Verification. More robust requirements for import Resource Adequacy capacity—both at the time of procurement and throughout the delivery period—are necessary to ensure that such contracts meaningfully commit forward physical capacity that is not already committed for other purposes.

I. Enabling Resource Adequacy Procurement To Compete With Forward Contracting Elsewhere In The West

A. CAISO Should Take Steps To Strengthen The System Resource Adequacy Framework

As California seeks to increase its reliance on renewable and non-emitting resources, it is critically important that the state enhance its existing forward procurement frameworks to more effectively compete to obtain commitments of the external capacity necessary to efficiently and cost-effectively maintain reliability. For years, CAISO has been able to rely on short-term purchases of energy from external resources to compensate for gaps in California's System Resource Adequacy framework. Fundamental changes to the grid—both in California and throughout the west—have largely eliminated the ability to continue these historical practices without dramatically increasing the risk that California will experience significant reliability issues. Within California, the growth in renewable resources has significantly increased the capacity and flexibility needed to balance the grid, while the retirement of significant portions of California's conventional generation fleet is reducing the resources that are available to meet these needs. At the same time, numerous LSEs outside of California are increasingly facing similar capacity and flexibility challenges due to the changing resource mixes on their systems, including the retirement of coal resources and significant additions of renewable resources. For example:

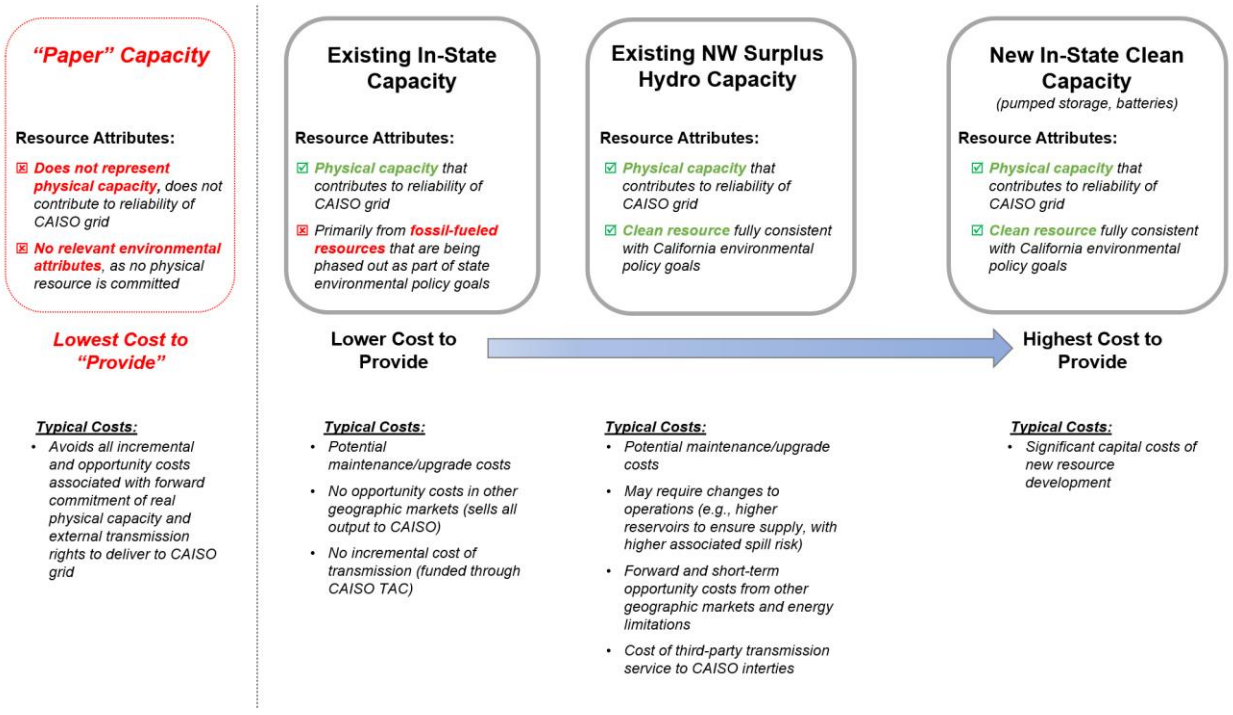
- Alberta has stated its intentions to completely phase out coal-fired generating facilities by 2030 and has started retiring and mothballing significant quantities of its coal fleet. Approximately 1,300 MW of coal generation was retired and/or mothballed in 2018, and an additional 300 MW of coal resources are expected to be retired by the end of this year.
- The Oregon Public Utilities Commission directed PacifiCorp to pursue the potential retirement of a portion of its coal fleet as part of its integrated resource planning process. PacifiCorp acknowledged that the retirement of its existing coal fleet has the potential to stress system reliability and currently is evaluating a portfolio of options to try to maintain system reliability while complying with these mandates.
- In Washington, the Centralia Steam Plant, the only coal-fired generation resource, is slated for retirement by 2025, with one of the two units at the plant expected to go offline in 2020.

- Talen Energy, the operator of Colstrip Steam Electric Station, recently announced that Talen and Puget Sound Energy will permanently retire the 614 MW associated with Colstrip Units 1 and 2 at the end of this year.

As supply conditions continue to tighten across the West, there is growing competition among LSEs that are systematically short on capacity to secure forward commitments of the limited surplus capacity and flexibility that remains available. Indeed, numerous LSEs outside of California already are taking steps to secure seasonal, yearly and multi-year commitments of energy and capacity from suppliers with remaining surplus capabilities.

Powerex believes that the growing need and competition for surplus capacity and flexibility across the west is dramatically increasing the importance of ensuring that California's forward procurement frameworks are sufficiently robust to ensure that California is able to reliably and cost-effectively achieve its renewable goals. Even as grid conditions continue to tighten, there will continue to be entities outside of California, particularly Northwest hydro entities, that collectively have significant surplus capacity and flexibility that can be committed in advance to meet the reliability requirements of other LSEs. Indeed, as depicted in Figure 1. below, Powerex believes that the large storage hydro systems in the Pacific Northwest can play a significant role in cost-effectively meeting California's reliability challenges, with clean energy supply that is consistent with California's environmental objectives.

Figure 1



Absent steps to strengthen California's forward procurement frameworks, however, it is likely that the surplus capability of the large hydro systems in the Northwest will be committed on a forward basis to meet the annual and seasonal capacity and flexibility needs of LSEs in regions outside of California, leaving little or no capacity and flexibility available to California on a short-term basis.

In short, California's ability to unlock the benefits of Pacific Northwest hydro storage resources will depend on its ability to establish a forward procurement framework that allows it to compete to secure commitments of the limited surplus capacity and flexibility that exists in the West (while also preventing the participation of speculative supply). This will require moving away from a framework premised on month-ahead, month-at-a-time procurement, which is likely to prove to be unworkable on a going-forward basis for several reasons:

- The prospect of a commitment for a single month will not induce the development of new resources or encourage external hydroelectric entities to plan the operation of their systems to ensure that they have excess capacity and flexibility available for California in the peak summer months.

- In addition, California's continued reliance on monthly procurement will likely limit the state's ability to compete to obtain commitments from external resources, as competing buyers outside of California typically offer to purchase seasonal, yearly, or multi-year contracts.

- As a practical matter, waiting until the month-ahead timeframe to procure capability will likely mean that the vast majority of external capacity is already committed under alternative arrangements with entities outside of California.

It is critical that California position itself to be attractive relative to other forward procurement opportunities, such that the state can compete to obtain the surplus capacity and flexibility of external regions. Powerex thus encourages CAISO to work with the CPUC to modify the System Resource Adequacy framework to require LSEs to meet Resource Adequacy requirements on a seasonal basis (*i.e*., with contracts that, at a minimum, cover the summer or winter season) and on at least a year-ahead basis. Powerex believes that this type of structure would have key advantages over the existing framework:

- A seasonal procurement framework would ensure that California LSEs are procuring forward capacity on a similar timeframe as in bilateral forward markets, and would avoid the potential that California LSEs will "miss out" on cost-effective procurement opportunities from external resources. At the same time, using a year-ahead procurement requirement would avoid the risk of over-procurement that can arise when basing procurement on longer-term forecasts that may turn out to be incorrect.

- Establishing a seasonal procurement requirement, with sufficient lead time, would also reduce the current risks associated with errors in forecasting the precise month in which the summer peak load in California occurs. Notably, in recent years, actual system peak demand was not in the same month as the forecasted peak.

- Enabling a seasonal rather than a full year-long contract will allow California LSEs and California ratepayers to benefit from regional diversity in peak load between California's summer-peaking system and external regions that experience a peak load in the winter. Such a framework would ensure that California LSEs can take advantage of this regional diversity and reduce the total costs of meeting California's reliability needs. At the same, establishing at least a year-ahead procurement requirement for the seasonal product would give the operators of storage hydro systems adequate lead time to plan their systems to increase the amount of committed capacity and flexibility they can provide to California over the summer season.

B. CAISO Should Take Steps To Strengthen The Capacity Procurement Mechanism

Ensuring that California is able to effectively compete to obtain the capacity necessary to maintain reliability also will necessitate taking steps to strengthen CAISO backstop procurement framework. In particular, Powerex believes that continued reliance on a backstop procurement mechanism that procures capacity on a month-ahead basis or for one month at a time is likely to prove unworkable for the same reasons that a System Resource Adequacy framework premised on month-ahead/month-at-a-time procurement is no longer viable. While Powerex recognizes that implementing the broader changes to the System Resource Adequacy framework set out above will require coordination with the CPUC, Powerex believes that CAISO can immediately take steps to strengthen its backstop authority by procuring seasonal capacity products on a year-ahead basis.

Powerex also believes that the existing CPM soft offer cap has the potential to undermine CAISO's efforts to enhance the System Resource Adequacy framework, as it is not sufficiently robust to avoid giving California LSEs an "economic option" not to procure the capacity necessary to meet system needs. More specifically, the existing CPM soft offer cap, when applied to a contract of only one or two months, is too low to attract capacity commitments from either new or external resources and has the potential to give California LSEs an economic incentive to under-procure. Powerex believes that moving to a seasonal product with compensation up to a fixed percentage of the annual CPM soft offer cap would help CAISO to more effectively compete to obtain commitments of the capacity of external resources.

II. Ensuring Import Resource Adequacy Meaningfully Contributes To Meeting California's Reliability Needs

A. Steps Must Be Taken To Eliminate The Speculative And Non-Firm Supply Of Import Resource Adequacy

Powerex believes that the failure of the existing System Resource Adequacy rules from preventing speculative and non-firm imports from counting towards meeting CAISO's System Resource Adequacy requirements represents a major impediment to cost-effectively meeting California's reliability needs in the future. In particular, the existing rules governing the participation of imports in the Resource Adequacy program fall short of what is necessary to ensure that all import Resource Adequacy contracts represent firm commitments that are backed by the real physical capability (*i.e.*, "steel in the ground") and firm transmission rights necessary to meet associated delivery obligations. Specifically, the existing import Resource Adequacy rules present three categorical problems.

First, the existing requirements create opportunities for entities to enter into Resource Adequacy commitments that are not backed by a forward commitment of real physical capacity. Because a supplier is not required to demonstrate that it actually has the surplus physical capacity necessary to support its obligation at the time of execution, an external entity can enter into a Resource Adequacy contract with an LSE and either: (1) submit a relatively high priced offer into the day-ahead market in order to minimize the chances that it will be called upon to deliver energy; or (2) submit an offer that is more likely to be dispatched, in the hopes that it will be able to procure energy on a short-term basis to fulfill any dispatched energy obligation. Even if such entities are able to procure energy through the short-term markets, such commitments represent little more

than “paper capacity,” providing no resource adequacy value to California LSEs. The use of such contracts is no different than simply lowering the Resource Adequacy requirement in the first instance. Resource Adequacy commitments are intended to represent a forward commitment of real physical capacity, not merely a promise by an energy market intermediary to attempt to procure energy in the short-term markets in the event that energy is called upon to meet its delivery obligations. In effect, such arrangements are allowing certain entities to be compensated as if they are committing capacity to California – when they are not – with California ratepayers bearing significant costs of commitments that make little contribution to meeting system reliability needs.

Second, under the existing rules, external supply may be double counted. This can occur when an external supplier has physical capacity that may be equal to or greater than its import Resource Adequacy contract, but some or all of the capacity that is being relied upon is not surplus to its expected obligations in the source BAA where the capacity is located. In such situations, the same physical capacity is being counted upon to maintain reliability both in the source BAA and California. In this case, the contract is notionally backed by physical capacity, but the supplier is effectively depending on its ability to procure firm energy in the short-term markets, including in peak demand hours, to meet its commitment to the home BAA. If unsuccessful, the external supplier will be forced to curtail its deliveries to California. Again, in this scenario, California ratepayers are effectively paying the supplier for a product that is not actually being provided—the forward commitment of physical capacity to California.

And third, under the existing program, the contract may be backed by physical capacity, but the supplier has either failed to procure sufficient operating reserves necessary to fulfill its delivery obligation with a high degree of confidence, or it has failed to support its deliveries with firm transmission to the CAISO grid. To the extent that the supplier fails to carry sufficient operating reserves (including spinning, non-spinning, and balancing reserves) to support its commitment, the likely result will be that deliveries to the CAISO will be curtailed when there is either an outage or renewable production drops off. Similarly, where a contract is supported by non-firm transmission, deliveries to California will be curtailed to the extent that firm rights holders over the relevant transmission path use their rights. Importantly, this can often happen when the firm rights holder uses its rights to deliver energy to other BAAs. Again, in this situation, California ratepayers are being required to bear the costs of capacity from suppliers that have failed to take critical steps to ensure it will be available to meet system needs when called upon by the CAISO.

Allowing import Resource Adequacy contracts to continue to count towards meeting Resource Adequacy requirements in any of the scenarios above is inconsistent with the objectives of the Resource Adequacy program, exposes the grid to additional risk of reliability incidents, and allows certain entities to receive “money for nothing” to the detriment of California ratepayers. Ultimately, each of the scenarios set out above is no different than simply reducing the System Resource Adequacy requirement and leaning on energy purchases through the day-ahead market to maintain reliability. In each of the three scenarios, the entity that has agreed to supply Resource Adequacy is effectively relying on being able to procure surplus firm energy on a short-term basis to support its commitments. When it is unable to do so, the inevitable result will be that deliveries to California will be reduced, leaving CAISO to scramble to figure out how to maintain reliability in the face of these delivery failures.

Powerex believes that allowing such contracts to qualify to meet Resource Adequacy requirements harms both California ratepayers and external suppliers that have invested in the

"full package" of physical capacity, operating reserves, and firm transmission rights that are necessary to reliably serve California's needs:

- California ratepayers are harmed because they bear significant costs associated with these contracts—which represent little more than "paper capacity"—without actually receiving the reliability benefits associated with the forward procurement of capacity. When a portion of these suppliers inevitably fails to deliver energy in the short-term markets in accordance with their commitments, often in higher demand hours, California ratepayers are then required to bear the costs of short-term energy prices that are higher than would have occurred if real physical capacity was committed on a forward basis to California instead. The result is a net wealth transfer from California consumers to energy market intermediaries providing "paper capacity".
- At the same time, physical suppliers that have invested in physical capacity, operating reserves, and firm transmission rights – and who could play an expanded role in cost-effectively meeting California's reliability needs – are "crowded out" of the market. Because an external supplier that supports its commitment with real, surplus, physical capacity and necessary investments in transmission rights will incur numerous costs that a speculative supplier, as described above, is able to avoid, speculative suppliers are able to displace physical supply from the market by undercutting the pricing of external suppliers that have invested in the capabilities to actually perform. This, in turn, harms California ratepayers again, as displaced external physical suppliers will commit their capacity to meet the needs of other regions – even if they were able and willing to serve California's needs more cost-effectively than alternative new or existing internal resources.

It is important to recognize that there will be both energy market intermediaries and some California LSEs who have a vested interest in a continuation of the status quo and are likely to be opposed to adopting such requirements. Obviously, certain external sellers will have a financial incentive in continuing to sell "paper capacity," allowing them to reap the financial benefits of a Resource Adequacy contract without incurring the costs associated with investing in the physical capabilities and transmission rights necessary to support their obligation. But certain LSEs may also have a financial interest in continuing to allow them to meet Resource Adequacy requirements with "paper capacity" as well, as these contracts may be less expensive than contracts that are backed by the actual forward commitment of physical capacity. Powerex notes that in an integrated grid the reliability risks of one LSE's forward procurement decisions are socialized over all users of the grid. As a practical matter, this means that while 100% of the cost savings associated with relying on paper capacity will flow to the parties of a contract for "paper capacity," the risks associated with such contracts will be spread across all LSEs and users of the CAISO grid.

Powerex appreciates the CAISO's continued study of the performance of import Resource Adequacy. However, Powerex notes that is important to recognize that historical information regarding the frequency of delivery failures on import Resource Adequacy contracts is unlikely to be indicative of the portion of Resource Adequacy requirements that are being met by speculative or non-firm supply or the reliability risks associated with this supply. As an initial matter, the fact that a certain percentage of import Resource Adequacy failed to deliver during a given period does not mean that the remaining import Resource Adequacy contracts were backed by physical capability committed on a forward basis and firm transmission to ensure delivery. In reality, a material portion of the remaining import Resource Adequacy contracts may have been from

speculative suppliers that either 1) bid their associated energy supply into the market at a level that would ensure that they would not clear or 2) were simply fortunate in being able to procure sufficient energy through the short-term markets to deliver on their energy dispatches.

In practice, it is likely that speculative suppliers may often be able to procure short-term energy to fulfill their delivery commitments in the vast majority of hours when there is low to moderate load and supply is less constrained in the West. But the point of a Resource Adequacy program, by design, is to ensure that there is sufficient capacity available during critical hours of peak load and/or regional supply scarcity to reliably operate the system and serve demand with a high degree of confidence. It is in these hours when it is most likely that there will not be sufficient energy available through the short-term markets to backfill these Resource Adequacy commitments and when it is most critical that there be physical capacity, operating reserves, and firm transmission rights that have been set aside to meet the needs of California. In reality, the information that is available suggests that a significant portion of import Resource Adequacy contracts may be made up of speculative supply, as a significant portion of the supply associated with import Resource Adequacy contracts is being bid into the market at levels that ensure that they are not required to deliver, even during the tightest grid conditions,[1] and import delivery failures typically skyrocket during peak periods.[2]

Additionally, the historical ability of speculative suppliers to procure energy through the short-term markets should not provide any comfort about future performance given the current and expected future tightening grid conditions throughout the west. As grid conditions tighten, and regions outside of California increasingly enter into forward commitments to secure the limited surplus capacity and flexibility that exists, it can be expected that the quantity of energy available on a short-term basis to backstop import Resource Adequacy contracts will be far more limited in the past. Absent steps by CAISO and the CPUC in the current stakeholder proceedings, the likely result will be an increase in the non-delivery of import Resource Adequacy and higher reliability risks for California ratepayers.

B. Import Resource Adequacy Requirements Should Be Further Tightened To Protect Against The Risks Of Speculative And Non-Firm Supply

In the Revised Straw Proposal, CAISO proposes a number of modifications to the rules governing import Resource Adequacy to safeguard against the risks of speculative supply. While Powerex supports these efforts, Powerex believes that further enhancements are necessary to ensure that all import Resource Adequacy contracts can be counted upon to maintain reliability when called upon by the CAISO and provide value to California ratepayers. Powerex believes that this requires taking steps to:

- Ensure that a Resource Adequacy commitment is supported by the physical capacity, firm transmission, and operating reserves necessary to ensure delivery with a high degree of confidence; and

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[1] CAISO, Dept. of Market Monitoring, Import Resource Adequacy at 3 (Sept. 2018) (stating that on July 24, 2018, "only 84 percent [of Resource Adequacy import capacity] was accepted in the day-ahead market in hour-ending 20 with a system marginal energy price of $979/MWh").

[2] *Cal. Indep. Sys. Operator Corp.*, Intertie Deviation Settlement, Draft Final Proposal at 34-37 (Feb. 13, 2019).

- Require that a supplier that has committed to provide Resource Adequacy continues to have the physical capability, transmission, and operating reserves necessary to deliver energy during each day of the delivery term.

Figure 2 below provides a high level overview of the requirements that should be imposed on import Resource Adequacy contracts to achieve these objectives. Each of these requirements is further discussed below.

Figure 2

Origin	Requirement	Purpose
Forward Contract Obligations	Identification of Source BA and e-Tag generation source	Ensure forward commitment of physical capacity
	Representation that committed resource is expected to be surplus to needs of Source BA and any commitments to other entities	Ensure physical capacity is not double-counted
	Commitment that all deliveries under the contract will be Firm Energy (contingency reserve *and* balancing reserves by Source BA)	Ensure capacity can be relied upon to be delivered when called upon
	Commitment that delivery of committed capacity will be scheduled on Firm (7-F) transmission rights on all transmission segments from source to the designated CAISO intertie scheduling point	Ensure delivery is on transmission service not already committed to a higher-priority use
	Identification of CAISO intertie scheduling point	Ensure import RA is consistent with CAISO import capability
CAISO Tariff	Approved Day ahead e-Tag for every hour of RA contract term showing same Source BA and generation source as contract	Demonstrate the contracted RA resource is being made available to CAISO
	Approved Day ahead e-Tag for every hour of RA contract term showing same CAISO intertie scheduling point as source contract	Verify the delivery location of the RA obligation
	Approved Day ahead e-Tag for every hour of RA contract term showing transmission path from source to sink, all on Firm (7-F) service	Verify a complete path from Source to Sink, with each transmission segment using firm (7-F) transmission service
	Approved Day ahead e-Tag for every hour of RA contract term with transmission allocation equal to committed RA quantity	Verify transmission quantity is consistent with the RA obligation and confirmed by the appropriate external Transmission Service Providers (TSPs)
	Approved Day ahead e-Tag for every hour of RA contract term with initial energy profile equal to committed RA quantity	Demonstrate that the Source BAA has confirmed a total potential energy delivery that is consistent with the committed RA obligation
	Day ahead e-Tag energy profile is reduced to be consistent with CAISO DAM results	Reduction of energy profile enables transmission to be made available to support economic dispatch of other resources

Energy deliveries are Firm Energy (Source BA carries contingency and balancing reserves to ensure delivery)	Ensure RA resources include the necessary reserves at the Source BAA to reliably deliver energy when called upon
Day ahead e-Tag transmission allocation may be reduced to the extent there is no real-time must offer obligation	Enable resource and transmission contracts to be re-used for other purposes to the extent there is no RA obligation in real-time

1. Suppliers Must Demonstrate That Contracts Are Supported By Physical Capacity

Powerex believes that it is critical that CAISO and the CPUC work together to take steps to ensure that import Resource Adequacy contracts are backed by physical capacity that can be counted upon to perform when called upon by the CAISO. In practice, Powerex believes that this can be achieved by

- requiring the supplier to make an up-front demonstration of availability, identifying the physical resource at the time that the forward commitment is made, and
- requiring a continuing demonstration during the delivery term that the supplier has the capacity available necessary to meet its obligations.

With respect to the requirement that a supplier make an up-front demonstration, Powerex believes that CAISO and the CPUC should impose measures that require the seller to:

- identify the source BAA and provide an e-Tag source generation unit (or system resource) no later than the time of the System Resource Adequacy showings; and
- include language in its contract affirming that, at the time *the supplier enters the commitment* it has a reasonable expectation that the capacity supporting the contract will not be needed to meet any other capacity obligations in the source BAA;

In addition, during each hour of the delivery term, CAISO should require a seller of import Resource Adequacy to submit an e-Tag identifying the same source BAA and generation source that was designated in the import Resource Adequacy contract.

Powerex believes that requiring the up-front disclosure of the information set out above will reduce the potential for an external supplier to commit to provide import Resource Adequacy without securing the physical capacity necessary to support its obligation and waiting until it is dispatched in the day-ahead or real-time markets to attempt to procure energy on a short-term basis to meet its obligations. Moreover, requiring a seller to affirm that it has a reasonable expectation that the physical capacity backing the import Resource Adequacy contract is surplus to the need of the source BAA (or any other obligation) would help reduce the risk of "double-counting" of capacity, where the same capacity is being relied upon by the CAISO and the source BAA (or another party) to maintain reliability.

At the same time, requiring the submission of a day-ahead e-Tag will provide CAISO with the visibility necessary to help verify that the supplier has actually set aside the capacity at issue to support its obligations to the CAISO. Notably, CAISO already has visibility into the capacity supporting internal Resource Adequacy commitments, including detailed information regarding resource availability and operational characteristics. Requiring the submission of a day-ahead e-

Tag will help ensure comparable treatment of external resources by providing CAISO with greater visibility into the supply arrangements and capacity supporting import Resource Adequacy contracts.

Powerex emphasizes that the starting point of these rules should be that substitution of resources is not permitted. As a practical matter, allowing suppliers to substitute is likely to create opportunities that will be exploited by speculative suppliers to reduce their investments in the physical capability necessary to perform to the detriment of California ratepayers and physical suppliers alike. The problem with permitting substitution is that it can be very difficult to determine whether substitution is being used because the supplier did not have the resources necessary to support its contract in the first place or because other capacity is more economic.

For this reason, Powerex supports CAISO's proposal to eliminate forced outage substitution and encourages CAISO to narrowly limit any exceptions for planned outages to avoid the risks of speculative supply. To the extent that an external supplier seeks to substitute to compensate for a planned outage of a resource, then the supplier should be required to follow the same procedures applicable to internal resources and provide CAISO with full visibility into the supply arrangements supporting its import Resource Adequacy contract.

2. Import Resource Adequacy Contracts Should Be Support By Firm Transmission

a. Failure To Require Firm Transmission Creates Delivery And Double Counting Risks

Powerex believes that it is critical that all import Resource Adequacy contracts be supported by firm transmission in order to ensure that delivery does not depend on whether or not a higher-priority rights holder uses its rights. In evaluating the transmission that should be required to support an import Resource Adequacy contract, it is important to take into account the different priorities of transmission service that are available under the FERC Open Access Transmission Tariff ("OATT") framework that characterizes the West outside of California. Under this framework, the transmission capacity of a line may be sold multiple times to various rights holders, each of which have different priorities of use and access to the line.

There are two broad categories of transmission service under the OATT:

- *Primary service* – In the first instance, the capacity of a transmission path typically will be sold as firm transmission or, in some cases, conditional firm service. Firm rights holders (including conditional firm service) generally have priority access to the transmission capacity and are subject to curtailment only in certain limited circumstances, such as transmission de-rates.
- *Secondary service* – Transmission capacity sold to firm rights holders is then resold on a non-firm basis to other transmission customers for periods that can vary from one hour to one year. The ability of a transmission customer to flow on its non-firm transmission rights generally depends on whether firm rights holders use their rights during a given period. If the available capacity of the line cannot accommodate schedules submitted by both firm and non-firm rights holders, then the schedules of non-firm rights holders will be curtailed as necessary to preserve the ability of firm rights holders to use the line.

Figure 3 below sets out the types of transmission service available under the OATT:

Figure 3

Transmission Service	NERC Priority
Firm / Conditional Firm	7-F
Network Economy	*6-NN*
Monthly Non-Firm	*5-NM*
Weekly Non-Firm	*4-NW*
Daily Non-Firm	*3-ND*
Hourly Non-Firm	*2-NH*
Network Secondary	*1-NS*

*Non-firm service may be displaced by **any** product that is of a higher NERC priority*

Without a requirement that import Resource Adequacy contracts be supported by firm transmission, there is a risk that external transmission will be "double counted" for the Resource Adequacy program. In such circumstances, multiple suppliers may rely on the very same transmission capacity to allow them to schedule energy to multiple BAAs, with the risk those holding non-firm rights will have their schedules curtailed to the CAISO BAA to accommodate the schedules of firm rights holders. The lack of a firm transmission requirement increases the risk that a supplier that has committed to provide import Resource Adequacy will not be able to deliver when called upon by the CAISO. Importantly, the firm transmission holders may use their rights for another purpose or to deliver energy to another BAA, leaving the CAISO BAA short of the capacity associated with the resource adequacy commitment.

The risks associated with the lack of a firm transmission requirement have increased in recent years due to the implementation of intra-hourly scheduling. When the System Resource Adequacy program was first implemented, non-firm rights holders generally were only subject to curtailment prior to each hour. With the implementation of intra-hour scheduling, however, firm rights holders can now submit schedules on an intra-hour basis, increasing the risk that they will interrupt non-firm transmission in a given hour. In other words, the ability for a higher-priority rights holder to schedule on its rights does not "expire," meaning that non-firm schedules are subject to being displaced throughout the operating hour, often with little notice (*e.g.,* 20 minutes prior to each 15-minute interval).

In short, CAISO cannot count on import Resource Adequacy contracts supported by non-firm transmission to be available to serve load when called upon by the CAISO. To the extent that a higher priority customer schedules on its rights to deliver energy to another BAA, deliveries to the CAISO under "non-firm" Resource Adequacy contracts will be curtailed, and CAISO will be left to attempt to backstop these delivery failures through purchases of energy through the short-term markets.

For the foregoing reason, Powerex believes that it is critical that CAISO require that all import Resource Adequacy contracts be supported by firm transmission. Powerex notes that this requirement could be implemented by requiring that a seller holds firm transmission rights at the time of contract execution. Powerex believes, however, that such a requirement may be overly restrictive for a number of reasons:

- While transmission on some paths is procured on a yearly or multi-year basis on sought-after paths, there are other paths where customers are regularly able to confidently obtain firm transmission on a monthly, daily, or hourly basis and often at a savings to obtaining firm transmission further in advance.
- Many transmission service providers in the west will release additional firm capacity on less than a full year basis. Imposing a requirement on sellers that they demonstrate that they have transmission at the time of execution would unnecessarily prevent sellers from taking advantage of the release of firm on a shorter-term basis.
- The timelines associated with the renewal of expiring long-term firm rights can also prevent a forward "showing" of firm transmission for the entire delivery term, even if the seller is highly confident that they will be able to obtain those rights by the time of delivery (or even have a contractual right to renew its rights).

Powerex believes that imposing requirements that the seller of import Resource Adequacy: (1) affirm in the contract that it will procure sufficient firm transmission rights necessary to ensure that the resource can deliver energy in accordance with any associated energy delivery commitments; and (2) submit an e-Tag on a day-ahead basis for each day of the delivery term showing firm transmission equal to the Resource Adequacy commitment would be sufficient to ensure that import Resource Adequacy contracts can be counted upon to deliver without adopting unnecessarily stringent requirements that restrict the quantity of supply available.

b. Attempts To Weaken These Requirements Should Be Rejected

Powerex recognizes that imposing a firm transmission requirement will limit the ability of a supplier to substitute the source of the capacity supporting the contractual commitment. But the unfettered ability to meet System Resource Adequacy requirements with capacity obtained at the last minute and on non-firm transmission undermines the purpose of procuring capacity on a forward basis in the first place.

Powerex urges CAISO not to be persuaded by those that may argue that requiring firm transmission would somehow be harmful to efficiency. In effect, these entities are arguing for a framework that permits a reliability product to be delivered on transmission that can be curtailed or displaced by higher priority uses at any time – including within the operating hour and with only 20 minutes' notice. Ultimately, these entities are using vague concerns about "efficiency" to justify a framework that allows them to avoid incurring the costs of investing in the transmission necessary to ensure that they can deliver energy in accordance with their Resource Adequacy commitment and instead rely on low quality, "as available" transmission procured on a last minute basis. Like in the case of an entity that counts on its ability to support its Resource Adequacy commitment with short-term purchases of energy, an entity that fails to procure firm transmission to support its obligation is hoping that a higher priority rights holder will not use its rights during the same hour that CAISO requests delivery of energy associated with the Resource Adequacy obligation. In practice, however, it is during those periods when CAISO most needs the energy (*e.g.,* during peak or stressed conditions) that higher priority transmission customers are most likely to use their rights. In other words, the risk that an import Resource Adequacy contract supported by non-firm rights will be bumped to accommodate the use of higher priority users of the grid is likely to be highest during those periods when CAISO most needs the energy associated with these contracts. The risk of non-delivery associated with the use of non-firm rights is likely to be even higher for external resources that require multiple transmission segments

to reach the CAISO. To the extent a resource is seeking non-firm transmission over multiple paths and across multiple BAAs, the chances that the entity will be able to successfully secure and deliver on a lower quality product will only decrease.

Other entities may argue that no firm transmission rights are available to support System Resource Adequacy contracts or that requiring firm transmission rights could act as a barrier to competition. Such arguments should be rejected as misguided and fully unsupported by the facts. When evaluating such arguments, it is important to keep in mind the following:

- As a starting point, external resources account for a small quantity of the System Resource Adequacy market. In practice, external resources compete with internal resources to make sales of System Resource Adequacy, a market that is approximately 50,000 MW. Historically, import Resource Adequacy contracts have represented a relatively small share of the System Resource Adequacy market, typically accounting for 4,000 MW or less in aggregate.
- The market for external transmission rights is highly competitive. Notably, firm transmission rights outside the CAISO, including to CAISO import locations, are allocated through a highly competitive process through the OATT framework that has been developed and approved by FERC. In practice, this framework is applied both to the initial acquisition of firm transmission rights on a given path and to requests to renew these rights. There also is a competitive secondary market framework for firm transmission rights, with numerous entities purchasing hourly to yearly firm transmission rights to California import locations through this framework over the years.
- Public data shows that there are numerous holders of firm transmission rights to the major interties with California, For instance, nineteen different entities hold transmission rights on the Pacific AC and Pacific DC transmission facilities that connect the Pacific Northwest with California, with thirteen different entities holding more than 100 MW of rights and five different entities holding more than 500 MW of rights.[3] In addition, the total firm capacity to deliver reliable external supply to these two locations alone is 7,900 MW – nearly two times the historical level of System Resource Adequacy requirements met by import Resource Adequacy and far in excess of the intertie capacity at the PACI and NOB interties allocated through the Maximum Import Capability ("MIC") framework.

The competitive framework for securing firm transmission outside the CAISO stands in stark contrast to the allocation of intertie capability that has historically occurred through the MIC framework. As shown below[4], holdings of import rights for 2019 Resource Adequacy purposes on the CAISO side of the interties is far more concentrated, with the two large incumbent investor-owned utilities holding approximately 45% of all import transmission rights for Resource Adequacy contracting purposes in 2019. Notably, under the MIC framework, these entities neither have to compete to acquire these rights nor incur any incremental costs associated with their procurement. In other words, it is a free product, acquired without competition, through a process that is limited to California LSEs and uses a load ratio share based allocation process that favors the largest LSEs.

[3] Information regarding the holdings of firm transmission at these locations is based on information available through wesTTrans.net, an OASIS site operated by Open Access Technology International, Inc.

[4] Information regarding MIC allocations is available at http://www.caiso.com/planning/Pages/ReliabilityRequirements/Default.aspx.

2019 MIC Allocation (PACI_MSL)	**MW**
Pacific Gas & Electric	995
Powerex	500
Clean Power Alliance of Southern California	139
Marin Energy Authority	125
Shell Energy North America	99
Silicon Valley Clean Energy	91
Peninsula Clean Energy Authority	83
Monterrey Bay Community Power Authority	79
Sonoma Clean Power	62
Holders of 25 MW of less	*182*
Total MIC Allocation	**2354**

2019 MIC Allocation (NOB_ITC)	**MW**
Southern California Edison	752
San Diego Gas & Electric	150
Clean Power Alliance of Southern California	149
East Bay Community Energy	60
Constellation New Energy, Inc.	59
San Jose Clean Energy	56
Direct Energy, L.L.C.	38
Pilot Power Group, Inc.	38
Shell Energy North America	26
Holders of 25 MW of less	190
Total MIC Allocation	**1517**

3. Import Resource Adequacy Contracts Should Be Supported By Firm Energy

Powerex believes that CAISO should impose requirements to ensure that import Resource Adequacy contracts represent a commitment to deliver firm energy when called upon by the CAISO. In practice, this means that deliveries from an import Resource Adequacy contract should be supported by sufficient operating reserves (including spinning, non-spinning, and balancing reserves) to ensure that the supplier will deliver in accordance with its commitment with a high degree of confidence. To the extent that a supplier fails to carry sufficient operating reserves to support its commitment, the result is that deliveries to the CAISO will be curtailed when there is

an outage or renewable production slows. In order to ensure that import Resource Adequacy contracts can be counted upon to deliver firm energy, Powerex believes that entities committing to provide import Resource Adequacy should include language in their contracts confirming that they will carry sufficient operating reserves (*e.g.,* spinning, non-spinning, and balancing reserves) to ensure that the resource can deliver energy in accordance with any associated energy delivery commitments.

While Powerex believes that the CAISO should be careful to avoid creating exceptions to these requirements, CAISO could also provide an option for external variable energy resources ("VER") to provide import Resource Adequacy without any requirement that the source BAA carry balancing reserves (*i.e.,* only contingency reserves would be required). As a practical matter, allowing external VERs to provide System Resource Adequacy capacity without balancing reserves would mean that the CAISO grid would bear the risk associated with VER availability. However, this is no different than the risks that are borne by CAISO in connection with internal VERs. In order to show comparability with internal resources, however, Powerex believes that the quantity of capacity provided by external VERs that elect not to provide balancing reserves would be subject to the application of the effective load-carrying capability ("ELCC").

Powerex also believes that it would be appropriate to give external thermal resources the option of providing System Resource Adequacy on a "unit-contingent" basis. Under this framework, rather than providing firm energy, the resource could provide the CAISO with full visibility into the availability and operating characteristics of the unit. More specifically, under this framework, an external resource – like an internal resource – would comply with its must-offer obligation by submitting a three-part bid, be eligible for bid-cost recovery, and would have its capacity calculated using the same unforced capacity measures applied to internal resources.

4. Applying Requirements to Two Common Contract Structures

Powerex believes that the requirements set out above are sufficiently flexible that they can be applied to the two different types of Resource Adequacy contract structures that are commonly traded—firm energy contracts and stand-alone capacity commitments—while successfully preventing speculative and non-firm supply from qualifying to provide import Resource Adequacy.

In the case of a stand-alone contract, a California LSE procures and pays for capacity only. In exchange, the seller agrees to submit an offer to supply energy in the CAISO day-ahead market, but any resulting dispatch is an energy sale by the Resource Adequacy seller to the CAISO. The California LSE that purchased the stand-alone Resource Adequacy has no visibility into the financial settlement of any dispatched entity. In order to ensure that stand-alone contracts are backed by physical capacity and can be counted upon to be available when called upon by the CAISO, an entity that enters into a stand-alone Resource Adequacy contract should be required to:

- Specify in the contract the source BA and generation (or system) source;
- Affirm that the capacity is expected to be surplus to all other needs and commitments of the source BA; and
- Commit that any energy associated with the contract will be firm energy and delivered to a designated CAISO intertie point on firm transmission and supported by sufficient operating and contingency reserves.

During the contract term, the entity selling System Resource Adequacy should also be required to submit a day-ahead e-tag showing:

- the same source BA and generation source as set out in the contract;
- firm transmission from the source to the CAISO intertie specified in the contract;
- transmission allocation equal to the quantity of the Resource Adequacy commitment; and
- an energy profile initially equal to the quantity of the Resource Adequacy commitment, which can be adjusted based on the results of the day-ahead market.

In the case of a forward physical energy contract, a California LSE procures energy bundled with physical capacity.[5] This means that energy provided under the contract is "must-take" and typically self-scheduled by the California LSE into the CAISO grid rather than economically offered to the CAISO. The California LSE—not the Resource Adequacy supplier—is then paid by the CAISO for the value of the energy. There are a number of reasons why parties may decide to enter into a bundled sale of energy and capacity rather than a stand-alone capacity contract. For instance, suppliers may prefer to sell both together in order to provide greater certainty in terms of managing water flows and other aspects of their system's operations. Purchasers may prefer a bundled sale of energy capacity to allow them to hedge their energy costs while meeting Resource Adequacy requirements.

Powerex believes that the same requirements applicable to a stand-alone sale of capacity set out above can readily be applied to a forward physical energy contract.[6] The only difference is that the California LSE would have a greater role in scheduling deliveries to the CAISO. Nevertheless, in this case, the e-Tag would still be required to identify the same source BA and generation (or system) source identified in the contract, show firm transmission from the source to the CAISO intertie specified in the contract, and include a transmission allocation and energy profile equal to the Resource Adequacy commitment.

Powerex believes that it is critical that California LSEs have the flexibility to meet Resource Adequacy requirements using both stand-alone Resource Adequacy contracts and forward physical energy transactions, and that such transactions can play an important and complementary role in helping to ensure that California's Resource Adequacy needs are met efficiently and cost effectively.

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[5] Powerex notes that bilateral forward physical energy can be transacted for any mutually agreed delivery period or shape. However, standard products have been developed to promote liquidity, with the two standard products being Heavy Load Hours (HE7-2, Monday-Saturday) and Light Load Hours (HE1-6, 23-24). CAISO could consider working to promote development of a third standard product that would be a better fit for meeting peak demand on the CAISO grid. This could be achieved by defining two tiers of RA requirements, with the full Resource Adequacy amount required to be available from hours ending 7-9 and 17-21, and a reduced quantity of Resource Adequacy available in other hours. In effect, this product would be shaped to allow CAISO to meet load during higher load and continue to allow California LSEs to use must-take contracts while avoiding over-procurement that can exacerbate overgeneration conditions.

[6] Powerex notes that simply procuring block energy that is designated as WSPP Schedule C, without more, would not satisfy these requirements. Notably such transactions: (1) do not require delivery on firm transmission; (2) do not require identification of physical resources ahead of scheduled delivery; (3) do not require the same source BA or generation source for all hours or days of the performance period; and (4) do not require an advance representation that the commitment is surplus to the needs of the source BA or commitments to other entities. Thus, while WSPP Schedule C transactions may specify that energy cannot be recalled by the seller, they do not inherently meet the requirements set out above.

Notably, Powerex believes that imposing a requirement that all import Resource Adequacy contracts deliver energy each hour of the delivery term (*i.e*., only permitting bundled sales of energy and capacity) has the potential to be highly inefficient. In particular, imposing a requirement that suppliers with import Resource Adequacy commitments deliver energy during each hour of a given month, season, or year goes far beyond the requirements imposed on internal resources and will greatly interfere with CAISO's dispatch and scheduling processes, resulting in the inefficient dispatch and depletion of external resources to the detriment of California ratepayers. More specifically, Powerex believes that it is important that the rules relating to import Resource Adequacy contracts continue to enable CAISO to optimize the scheduling and dispatch of resources through its short-term markets to ensure that system requirements are met using the most efficient and cost-effective resources available, including those committed through the Resource Adequacy program. It also has the potential to exacerbate California's flexibility and renewable integration challenges by encouraging entities with Resource Adequacy commitments to self-schedule deliveries of energy into California in hours in which this energy is unnecessary to meet system needs. Finally, such an approach will increase the costs of import Resource Adequacy contracts as suppliers will need to consider the potential for substantive economic losses associated with delivering energy in many hours that it may be uneconomic to do so.

In other words, it would be a mistake to take the position that stand-alone sales of capacity are somehow less valuable or should play less of a role in meeting California's reliability needs. While it is the case that there is evidence that a significant percentage of entities with import Resource Adequacy commitments submit offers above projected day-ahead prices in order to reduce the chances that they will be scheduled and dispatched, Powerex believes that this is not an inherent feature of stand-alone capacity contracts. To the contrary, Powerex believes that this behavior is more likely an indication that the supplier does not have the physical capability necessary to support its commitment and would prefer to avoid having to procure energy in the short-term markets to meet its commitment. Powerex believes that eliminating speculative supply would largely remove the incentive for suppliers to engage in this type of behavior, as suppliers would have an incentive to reflect the prevailing value of energy from external resources in order to increase the chances that they would be scheduled and receive revenues through the energy markets.

In short, Powerex believes that both types of contracts—provided they are supported by real surplus physical capacity on a forward basis and energy deliveries backed by sufficient operating reserves and firm transmission—can play a cost-effective role in continuing to meet California's reliability needs. Thus, any import Resource Adequacy requirements adopted by the CAISO should be careful to permit both types of contractual structures while protecting against the risks of speculative and non-firm supply.

C. Powerex Supports The Application Of UCAP To Import Resource Adequacy Suppliers

Powerex supports CAISO's proposal to extend the use of UCAP to calculate the quantity of capacity that external suppliers can provide. More specifically, Powerex agrees that the historical performance of suppliers in meeting import Resource Adequacy obligations should factor into the future eligibility to sell Resource Adequacy just as it does in the case of internal resources. Powerex believes, however, that it would be unworkable to track the UCAP of individual resource

IDs, as these resources can be readily changed. Instead, Powerex believes that CAISO should apply UCAP at the Scheduling Coordinator level.

III. Conclusion

Powerex believes that this proceeding presents a tremendous opportunity for CAISO to work with external suppliers to enhance the Resource Adequacy program to ensure that CAISO is able to meet the challenges of a rapidly changing grid in California and throughout the west. By taking the steps outlined above, California will be able to more effectively compete to obtain forward commitments of external resources that have the surplus capacity and flexibility necessary to meet California's reliability needs while preventing these suppliers from being "crowded out" by speculative and non-firm suppliers.

Powerex also believes that resolving the issues set out above will reduce potential barriers to efforts to establish an EDAM. A large driver of the potential economic benefits of a regional day-ahead market is cost savings associated with a more efficient commitment of resources across the broader footprint. Pooling resources across multiple BAAs would allow for entities to reduce the commitment of higher-cost resources when lower-cost resources are available in other BAAs. Furthermore, it is likely an EDAM could result in the commitment of fewer resources in total using a centralized market dispatch that incorporates the diversity of resources and loads within the broader region. In short, many of the potential efficiencies of an EDAM depend on operating the grid in a highly coordinated manner, increasing each participant's reliance on its neighbors to ensure it has sufficient resources committed and available to meet load reliably. This increased reliance on other BAAs means that it is more than just potential EDAM benefits that are shared between BAAs – it may also result in a sharing of increased reliability risk if one or more BAAs are unexpectedly unable to meet their obligations to other participants. As a result, it is critical that each BAA in a potential EDAM be confident that the other BAAs are capable of meeting their obligations—an objective that will be undermined by the continued use of "paper capacity" to meet Resource Adequacy requirements.