



California ISO
Shaping a Renewed Future

Flexible Capacity Procurement

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Discussion Paper

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Flexible Capacity Procurement

1 Introduction

The ISO's renewable integration studies are providing growing evidence that reliably operating the grid with a 33 percent Renewable Portfolio Standard (RPS) requires California to maintain a fleet with flexible capacity resources both now and into the future. As the level of intermittent resources typically used to meet RPS requirements continue to increase, so does the need for flexible capacity resources. Currently, the California Public Utilities Commission (CPUC) is considering modifications to its Resource Adequacy (RA) program to incorporate flexible capacity procurement requirements. The ISO will continue working with the CPUC and other local regulatory authorities (LRAs) by providing the information required to incorporate requirements for flexible capacity resources into their respective resource adequacy and procurement requirements. While the ISO expects that these efforts will eventually result in LRA rule changes that address flexible capacity needs, the ISO believes it is equally important to examine complementary changes to the ISO's backstop capacity procurement authority to help ensure there are sufficient flexible capacity resources available to reliably operate the grid through 2020 and beyond.

The ISO intends to implement the flexible capacity procurement backstop authority in two phases.

- In Phase 1, the ISO will pursue tariff changes that will:
 - Ensure the ISO has sufficient backstop authority to address flexible capacity at risk of retirement that the ISO identifies as needed up to five years in the future.
 - Allow the ISO to procure flexible capacity resources should LSEs have shortfalls in procuring flexible capacity resources in meeting any flexible capacity requirement established by the CPUC in its current RA proceeding (R.11-10-023) or established by other LRAs.
- In Phase 2, the ISO will consider further modifications to flexible capacity procurement backstop mechanisms in anticipation of additional changes to the CPUC and other LRAs RA procurement requirements, including a longer-term RA procurement horizon of up to five years into the future.

2 Background

Integrating a 33 percent Renewable Portfolio Standard creates several new challenges for the ISO. Among these challenges is ensuring that the ISO has sufficient flexible capacity to address the added variability and unpredictability created by intermittent resources. This challenge is magnified even further with the prospect of losing over 12,000 MWs of flexible capacity resources to once-through-cooling mandates established by the State Water Resources Control Board. The ISO will work with the California Public Utilities Commission (CPUC) and other Local Regulatory Authorities (LRAs) to resolve many of these challenges through modifications to Resource Adequacy (RA) programs and procurement requirements. However, the ISO must ensure that it has a robust backstop procurement authority to resolve capacity deficiencies, when and where needed. Thus, the ISO is initiating this stakeholder process to address certain additions to the ISO's backstop capacity procurement authority necessary to maintain a sufficient amount of capacity from flexible resources.

There is growing evidence that reliably operating the grid with a 33 percent RPS requires re-evaluating not only how resources are dispatched, but the operating capabilities of resources that LSEs procure as resource adequacy capacity. This section details the growing evidence and concerns the ISO must address to maintain grid reliability while relying on a growing fleet of intermittent resources. This section also summarizes the CPUC's RA and Long-Term Procurement Plan (LTPP) requirements and their relationship to maintaining sufficient flexible capacity. Finally, this section summarizes related aspects of the ISO's existing Capacity Procurement Mechanism (CPM) tariff provisions and explains the reasons the ISO must have new authority for backstop procurement of flexible capacity.

2.1 ISO Renewable Integration Studies

To ensure renewable resources are reliably integrated into the California electric grid, the ISO has undertaken several comprehensive renewable integration studies over the years, including:

- Integration of Renewable Resources: Transmission and operating issues and recommendations for integrating renewable resources on the California ISO-controlled Grid.¹ (November 2007)
- Report on Preliminary Renewable Transmission Plans.² (August 2008)
- Integration of Renewable Resources: Operational Requirements and Generation Fleet Capability at 20% RPS.³ (August 2010)
- CAISO studies conducted as part of the CPUC's LTPP⁴

¹ <http://www.caiso.com/Documents/Integration-RenewableResourcesReport.pdf>

² <http://www.caiso.com/Documents/ReportonPreliminaryRenewableTransmissionPlans.pdf>

³ <http://www.caiso.com/Documents/Integration-RenewableResources-OperationalRequirementsandGenerationFleetCapabilityAt20PercRPS.pdf>

The Integration of Renewable Resources: Operational Requirements and Generation Fleet Capability at 20% RPS, or 20 percent RPS Report, is a comprehensive study that examines the flexibility of the current ISO fleet to reliably operate under a 20 percent RPS. Some of the key findings of the 20 percent RPS Report include:

- With additional variable energy resource production, the *net* load-following requirement could increase substantially in certain hours due to both to the variability of wind and solar production and forecast uncertainty.
- The increase in the regulation capacity requirements in the summer season between the simulations for 2012 and 2006 are estimated at 37 percent for regulation up and 11 percent for regulation down.⁵
- The increased supply variability associated with the 20 percent RPS results in dispatched gas-fired generators starting-up and shutting down more frequently. In an hourly simulation of 2012, combined-cycle generator starts increased by 35 percent compared to a reference 2012 case that assumed no new renewable capacity additions beyond 2006 levels. Also, energy production from combined-cycle units decreased by roughly 9 percent on an average, with greater reductions during off-peak hours when wind production is highest. This indicates the dispatchable fleet would be cycled more often.
- Lower capacity factors combined with reduced energy prices under the 20 percent RPS may result in a significant drop in energy market revenues for the gas-fired fleet.

Table 1 summarizes several relevant statistics that the RPS studies produced for conventional thermal generators under the 20 percent RPS as compared its reference case. As Table 1 shows, combined-cycle units will start-up and shutdown more frequently while the other conventional thermal generators will be started-up less frequently. All three types of units will produce less energy, both on- and off-peak, and will receive less revenue.

Table 1: Percent change 20 percent RPS, compared to Reference Case

	Combined Cycle	Simple Cycle	Gas Fired Steam Turbine
Number of starts	35 %	-21 %	-22 %
On-peak Energy (MWh)	-11 %	-39 %	-29 %
Off-peak Energy (MWh)	-16 %	-33 %	-18 %
Revenue (\$,000)	-16 %	-39 %	-29 %

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http://www.caiso.com/Documents/Summary_PreliminaryResults_33PercentRenewableIntegrationStudy_2010CPU_CLongTermProcurementPlanDocketNo_R_10-05-006.pdf

⁵ 2006 is used as a benchmark as that was the year the ISO recorded its highest peak loads.

The 33 percent RPS will decrease the need for energy from many existing conventional gas-fired resources even further. While the energy production of these conventional resources is being displaced by intermittent resources, the ISO will need even more of the flexible capacity that many conventional resources provide in order to maintain grid reliability under the 33 percent RPS. Consequently, the need to ensure that a sufficient fleet of flexible resources is maintained will only increase.

In 2011 the ISO undertook a number of studies to quantify the flexible capacity needed to reliably integrate the 33 percent RPS. Using assumptions provided by the CPUC, the ISO analyzed if a projected future generation fleet will be able to reliably integrate a 33 percent RPS.⁶ The study results indicate downward load following shortfalls in excess of 500 MWs in two of the CPUC's four priority scenarios.⁷ Additionally, the ISO studies found a shortfall of 4,600 MW of upward load following in the "High Load, Trajectory Scenario This "High Load, Trajectory Scenario" was a worst-case scenario constructed to demonstrate the implications of under forecasting load by 10 percent demand side management under-achieving goals.

2.2 Once-Through Cooling

Thirteen important conventional thermal generators (representing about 17,500 MW) and California's nuclear generators must retrofit, repower, or retire by 2020 and 2024, respectively, to comply with the California's "once-through cooling" policy mandate that restricts the use of coastal waters for power plant cooling. Many of these generators are located in load centers and areas with transmission constraints, making them necessary to maintain reliability. Additionally, a number of these generators are flexible and dispatchable and can be started quickly. The ISO must ensure that sufficient flexible capacity is available as the state works to implement the once-through cooling policy mandate.

2.3 CPUC's RA and Long-Term Procurement Plan (LTTP) Proceedings

The CPUC's LTTP and RA Proceedings are the primary mechanisms that ensure California has adequate generation capacity. The RA process requires load-serving entities to demonstrate that they have procured sufficient generation capacity to meet the upcoming year's forecast demand. The LTTP is the process by which the CPUC determines the three California Investor Owned Utilities' (IOUs) procurement needs for the next 10 years, including contracting for energy and constructing new generation.

The RA provisions require load-serving entities to demonstrate resource adequacy through annual and monthly RA showings.⁸ The annual RA showing, which occurs in October of the

⁶ The ISO assumed retirement of once-through-cooling plants and a certain amount of new generation.

⁷ These are detailed in the ISO's July 1, 2011 filing (Testimony of Mark Rothleder) in the CPUC's Long-Term Procurement Plan Proceedings

⁸ The ISO tariff has RA provisions that mirror CPUC requirements for non-CPUC jurisdictional entities.

prior year, requires that each load-serving entity demonstrate that it has procured at least 90 percent of 115 percent of their forecast peak load for the five summer months. In addition, there is an annual showing to demonstrate compliance with an annual local capacity requirement. Finally, load-serving entities make monthly showings to demonstrate that they have procured the remainder of the capacity needed to meet their forecast peak load.

The RA contracts provide revenue for generators in addition to energy payments, contributing towards generators recovering costs. The ISO is proposing a flexible capacity requirement in the current CPUC RA proceeding to ensure the amount of RA capacity that can provide load following, ramping, and fast-start capability. Otherwise, as the proportion of renewable and intermittent resources that count towards RA capacity requirements increases, the amount of RA capacity from conventional flexible resources could decrease as it is replaced by RA capacity from renewable resources. Consequently, the conventional flexible resources could receive less revenue and be at greater risk of being retired.

Uncertainty of maintaining conventional flexible resources also exists despite the LTPP provisions. While the CPUC looks out to a 10-year horizon in LTPP (with a particular focus on new capacity builds) and a single year ahead in RA, neither of these programs currently completely addresses the capacity needed in years two through nine. For example, while LTPP looks out 10 years, with the exception of some anticipated generation retirements, it assumes that the existing generation fleet remains intact. The LTPP does not consider the economic decisions of owners of generation without RA contracts. If a generator's power purchase agreement or RA contract expires in the middle of the LTPP outlook, there is no consideration in the LTPP that retirement might be the best economic option for the generator owner. Importantly, the ISO's ability to meet its future reliability requirements could be reduced if such a retirement occurs. The ISO believes that this is a reason that it needs a mechanism for backstop procurement of flexible capacity as a means to ensure reliability.

In addition, the CPUC last issued a LTPP final decision of need in 2007 (to meet 2014 demand). While the ISO has supported the resources that have been procured based on this needs determination, the 2007 CPUC LTPP decision did not fully consider the ISO's needs for integrating large numbers of renewable resources because this was not within the scope of the LTPP proceeding.

Finally, while approximately 90 percent of the ISO load is CPUC jurisdictional and subject to the CPUC's RA requirements, there is still approximately 10 percent of the ISO's load that is not. Ensuring the ISO has sufficient access to flexible resources requires a larger effort that includes not just the CPUC, but also non-CPUC jurisdictional entities within the ISO footprint. Therefore, the ISO will reach out to the other LRAs and work collaboratively with them to ensure that sufficient flexible capacity is available to the ISO from all LRAs.

2.4 Distributed generation

California is now examining policies to achieve 12,000 MW of distributed generation in California. Distributed generation is often behind the meter generation and the ISO cannot dispatch this generation and may not have visibility of the output of these resources. While increased levels of distributed generation may decrease system peaks, it may also increase what appears as load variability on the grid. For example, much of this distributed generation is expected to be photovoltaic installations, which could vary when cloud cover is intermittent, and which will start and stop production in unison as the sun rises and sets. Even with tools to improve the ISO's visibility of these resources, a large increase in distributed generation will likely increase the ISO's operational challenges.

2.5 Existing ISO Backstop Authority

While the ISO relies on the resources provided to it under RA mechanisms, the ISO maintains several methods it can use to ensure adequate capacity in various time frames. Among these mechanisms are the Capacity Procurement Mechanism (CPM) provisions of the ISO tariff. As defined in section 43 of the ISO tariff, the CPM provisions allow the ISO to procure generation capacity under several circumstances, including:

- 1) Insufficient Local Capacity Area Resources in an annual or monthly Resource Adequacy Plan;
- 2) Collective deficiency in Local Capacity Area Resources;
- 3) Insufficient Resource Adequacy Resources in an LSE's annual or monthly Resource Adequacy Plan;
- 4) A CPM Significant Event;
- 5) A reliability or operational need for an Exceptional Dispatch CPM; and
- 6) Capacity at risk of retirement within the current RA Compliance Year that will be needed for reliability by the end of the calendar year following the current RA Compliance Year.

Capacity eligible for CPM under the risk of retirement clause is further defined in Section 43.2.6 of the ISO tariff, granting the ISO the authority to:

Designate CPM Capacity to keep a resource in operation that is at risk of retirement during the current RA Compliance Year and that will be needed for reliability by the end of the calendar year following the current RA Compliance Year.

The ISO may issue a CPM designation for resources at risk of retirement if a given resource satisfies the following five criteria.

- 1) The resource was not contracted as RA Capacity nor listed as RA Capacity in any LSE's annual Resource Adequacy Plan during the current RA Compliance Year.
- 2) The CAISO did not identify any deficiency, individual or collective, in an LSE's annual Resource Adequacy Plan for the current RA Compliance Year that resulted in a CPM designation for the resource in the current RA Compliance Year.
- 3) CAISO technical assessments project that the resource will be needed for reliability purposes, either for its locational or operational characteristics, by the end of the calendar year following the current RA Compliance Year.
- 4) No new generation is projected by the ISO to be in operation by the start of the subsequent RA Compliance Year that will meet the identified reliability need.
- 5) The resource owner submits to the CAISO and DMM, at least 180 days prior to terminating the resource's PGA or removing the resource from PGA Schedule 1, a request for a CPM designation under this Section 43.2.6 and the affidavit of an executive officer of the company who has the legal authority to bind such entity, with the supporting financial information and documentation discussed in the BPM for Reliability Requirements, that attests that it will be uneconomic for the resource to remain in service in the current RA Compliance Year and that the decision to retire is definite unless CPM procurement occurs.

While the ISO is not proposing to expand the procurement authority of its existing CPM, it is reasonable to use the CPM design and its terms as a starting point. It is also important to use the CPM terms and conditions to highlight areas that need to be addressed to ensure there is no deficiency in the amount of flexible capacity required by the system. The existing CPM provides the ISO with the authority to backstop a resource, ensuring its availability if it is needed before the end of the second year. However, it does not allow the ISO to ensure sufficient flexible resources will be available beyond two years. Therefore, similar to the CPUC's RA and LTPP programs, the ISO's backstop authority also has a significant gap that must be addressed to avoid premature retirements of needed flexible resources.

2.5.1 *The Sutter Waiver Filing*

On December 12, 2011, the ISO issued "Basis and Need for Capacity Procurement Mechanism Designation of Sutter Energy Center."⁹ In this report, the ISO determined that the Sutter Energy Center (Sutter) plant satisfied four of the five criteria established in Section 43.2.6 of the ISO

⁹ Available at http://www.caiso.com/Documents/Basis_Need_CapacityProcurementMechanismDesignation_SutterEnergyCenter.pdf

tariff, failing to meet only criteria (3) listed above (i.e. that the plant is needed for reliability requirements in the immediately following year). Based on study results conducted as part of the CPUC's LTPP proceeding, the ISO determined the Sutter plant will be needed in the 2017-2018 time frame.¹⁰ Further, due to once-through cooling resource retirements, the ISO study results show shortages in the 2017-2018 time frame of over 3500 MW even if the Sutter plant is available to the ISO. As a result of this assessment, on January 25th, 2012 the ISO filed a waiver request at FERC in order to issue a CPM designation for Sutter for the remainder of 2012.¹¹ The ISO committed to conduct a stakeholder process to modify its tariff and provide an appropriate backstop authority to use for protecting capacity at risk of retirement multiple years in a forward time horizon as well as flexible characteristics.

2.6 Summary

In summary, the ISO has the following critical concerns moving forward that must be addressed through enhancements to the resource adequacy program and this initiative:

1. As California moves towards higher RPS goals, flexible generators will likely receive less revenue from energy payments, while they will be subject to more cycling and more frequent ramping.
2. Given the current fleet and potential OTC retirements, additional flexible capacity will be needed to integrate 33 percent RPS.
3. DG resources create unique operational challenges because currently, most DG resources cannot be managed, dispatched, or seen by the ISO and consequently can create additional variability to the grid.
4. The amount of current RA capacity having ramping, load following, and fast-start capabilities will shrink as more renewable resources are procured and receive RA credit.
5. Because CPUC jurisdictional LSEs currently account for only about 90 percent of the ISO's load, the ISO may have to secure additional flexible capacity through new backstop capacity procurement authority even if the CPUC implements new flexible capacity procurement requirements in their RA program and their jurisdictional LSEs meet those new requirements.

¹⁰ This shortage was identified in the CPUC's 33 Percent High Load (Trajectory) Scenario

¹¹ Additionally, the CPUC, in Resolution E-4471 (filed February 16, 2012) proposes that PG&E, SCE, and SDG&E enter into negotiations to contract with Sutter. The proposed contract duration is through December 31, 2012. This resolution has not yet been approved by the CPUC.

6. RA only covers the next year and LTPP covers year 10, but does neither fully ensures sufficient resources remain economically viable for years 2-9.
7. Current ISO backstop authority allows the ISO to procure resources that do not have an RA contract in the current year but may be needed by the end of the following calendar year. Thus, the ISO does not have sufficient backstop authority for any period greater than two years.
8. Current ISO backstop authority does not enable the ISO to procure flexible capacity resources should there be shortfalls in LSE's procurement of flexible capacity resources in meeting any flexible capacity requirement that is incorporated into the CPUC's current RA proceeding (R.11-10-023) and in other LRAs requirements.

3 Guiding Principles

In order to ensure capacity is available to provide adequate system flexibility and ensure the ISO is able to address each of the above issues, the ISO is:

- Actively participating in the CPUC's RA and LTPP proceedings and is committed to work with other non-CPUC jurisdictional LRAs to establish requirements to ensure load-serving entities procure flexible capacity.
- Designing a backstop procurement mechanism, using up to a five year forward assessment, by which flexible capacity at risk of retirement can be secured to prevent retirements that could exacerbate the challenges of reliably operating the grid. Additionally, this backstop authority would allow the ISO to backstop any deficiencies in the load-serving entity's procurement of flexible capacity resources under CPUC's or other LRA's respective RA programs.

The ISO proposes a two-phased stakeholder process to establish a backstop procurement mechanism. The first phase will focus on ensuring the ISO has sufficient backstop authority to address flexible capacity at risk of retirement and provide backstop authority needed to support any modifications made in the CPUC's or other LRAs existing RA procurement mechanism.¹²

The second phase will focus on additions to or modifications of flexibility requirements in anticipation of additional changes to the CPUC and other LRAs RA procurement requirements.

¹² While the Flexible Capacity Requirements proposal was initially presented in the CPUC's RA proceeding, the ISO intends that it would be applicable to all load-serving entities in the ISO balancing authority area and will require ISO tariff changes to implement.

The ISO expects that these flexibility requirements considered in Phase 2 will include assessments and procurement goals using a horizon of five years into the future.

The ISO proposes the following guidelines for this initiative:

- 1) This stakeholder process will set forth the ISO's authority and role for backstop procurement of flexible capacity.

The ISO does not wish to enter into the business or role of primary capacity procurement as part of this stakeholder process; this is the load-serving entities role based on CPUC and other LRAs requirements. The ISO will actively work with the CPUC and other LRAs to ensure long-term resource adequacy.

- 2) LRAs should make the assessment of the need for new generation construction.
- 3) The ISO should minimize the use of any backstop procurement mechanism. The ISO expects that modifications to RA program requirements will provide the vast majority of the flexible capacity the ISO will need.
- 4) At a minimum, the backstop procurement mechanism must be able to ensure that the portfolio of flexible resources is sufficient to maintain grid reliability.
- 5) The backstop procurement mechanism must balance the need to ensure flexible resources have sufficient capacity revenues to remain viable with the desire to minimize use this mechanism.
- 6) Resources should not receive a double payment for providing the same capacity

4 Proposed Timeline for the ISO Stakeholder Process

As noted above, the ISO is proposing a two phased approach. The ISO anticipates completing phase one by July 2012 and phase two by July 2013, with filings at FERC to follow each phase. The ISO offers the following initial schedule for this stakeholder process:

Date	Action
January 25, 2012	Issue Paper Release
February 6, 2012	Stakeholder Meeting
February 16, 2012	Stakeholder comments due
March 5, 2012	Draft Straw proposal
March 12, 2012	Stakeholder Meeting
March 22, 2012	Stakeholder Comments Due
April 3, 2012	Revised Draft Straw proposal
April 10, 2012	Stakeholder meeting
April 20, 2012	Stakeholder Comments due
May 8, 2012	Draft final Proposal
May 15, 2012	Stakeholder meeting
May 18, 2012	Comments due
July 12-13, 2012	ISO Board meeting
End of July, 2012	File at FERC
August 2012	Issue Paper detailing outstanding issues to be resolved in Phase two
September 2012	Stakeholder Meeting
Late September, 2012	Comments due
October 2012	Draft Straw proposal
November 2012	Stakeholder Meeting
Late November 2012	Stakeholder Comments Due
January 2013	Revised Draft Straw proposal
February 2013	Stakeholder meeting
Late February 2013	Stakeholder Comments due
April 2013	Draft final Proposal
May 2013	Stakeholder meeting
Late May 2013	Comments due
July 2013	ISO Board meeting
End of July 2013	File at FERC

5 Design Questions

5.1 Defining the Product

The ISO recently filed recommended modifications to the existing RA requirements in the current resource adequacy proceeding at the CPUC.¹³ The ISO's proposal would require, as a part of an LSE's procurement, that minimum amounts of specific flexible characteristics be procured. Through this initiative, the ISO is seeking backstop procurement authority to procure the flexible attributes from resources defined in the ISO's CPUC filing: Maximum Ramping, Load Following, and Regulation. These products are outlined in Table 2 below.

The ISO will use its backstop procurement authority to fill deficiencies in LSE resource adequacy flexibility requirements and for resources where ISO technical assessments project that a resource at risk of retirement will be needed for reliability purposes, either for its locational or operational/flexibility characteristics, within the next five years.

¹³ For greater detail, see the ISO's proposal at <http://docs.cpuc.ca.gov/efile/CM/157720.pdf>.

Table 2: ISO Proposed Flexible Requirement Categories

Maximum Ramping	Load Following	Regulation
Maximum Continuous Ramping for the Month	15-Minute Ramping	1-Minute Ramping
Requirement determined by longest continuous ramp <ul style="list-style-type: none"> • MW of ramp possible during longest continuous ramping period 	Requirement is the 15-minute ramping capacity need	Requirement is the need for regulation expressed in ramp rate of MW/min
Units must respond to ISO dispatch instructions. Renewable generation, base load units, and units that self-schedule are not eligible.	Unit must respond to ISO dispatch instructions.	Units must be regulation certified
Each resource’s contribution is ramping capacity over the time period: <ul style="list-style-type: none"> • Pmax – Pmin if the unit cannot start quick enough • Pmax if the unit starts and reaches Pmax during the ramp interval (example - if longest ramp interval is 5 hours for the month, a resource that starts and gets to its maximum output in less than 5 hours can count its Pmax toward maximum ramping requirements) 	Each resource’s contribution is the minimum of: <ul style="list-style-type: none"> • Pmax-Pmin • Ramp Rate(/minute) * 15minutes • Ramp Rate based on the MW weighted average ramp-rate of the resource for a resource with different ramp-rates for different operating ranges(i.e., use the megawatt size of the operating zone to weight the ramp rate for that zone). 	Ramp rate based on the MW weighted average ramp rate of the resource for the operating ranges where it can provide regulation.

5.1.1 Risk of Retirement

As revenues for conventional generation decrease and costs increase, the ISO is concerned that resources needed to provide flexible capacity in three to five years will retire. As noted above, the ISO tariff allows the ISO to offer a CPM payment when “CAISO technical assessments

project that the resource will be needed for reliability purposes, either for its locational or operational characteristics, by the end of the calendar year following the current RA Compliance Year.” However, as demonstrated by the Sutter Waiver filing, the ISO currently has no means of assuring flexible resources will be available beyond the next RA compliance year. Currently, in California, it can take seven years to build new capacity. If resources retire, leaving a forecasted deficiency of flexible capacity three to five years into the future, it will be very difficult to fill the void with new capacity. Therefore, the ISO proposes to design a mechanism that allows the ISO to use a five year outlook to assess the ISO’s need for resources at risk of retirement. Addressing flexible resources at risk of retirement beyond the existing CPM tariff provisions requires that the ISO create a new procurement mechanism and assess the most appropriate means and level for compensating resources as a part of the current stakeholder process. These issues are discussed in greater detail in Sections 5.2-5.5 of this paper.

5.1.2 RA Backstop

The CPUC is currently considering modifications to the RA program that “will consider any recommendations from the CAISO regarding the type of resources needed to manage the grid, and how to provide such resources to the CAISO within the RA program.”¹⁴ As noted above, the ISO has filed a proposal at the CPUC for flexible resource procurement requirements. Additionally, the ISO will work with other LRAs to address modifications to their RA programs that will enable the ISO to continue reliably operating the grid. Based on the modifications made to the CPUC’s RA program and other LRAs programs, the ISO will modify its tariff to allow the ISO backstop any RA procurement deficiencies.

5.2 Eligible Resources

The ISO must determine which resources provide the type of capacity that meets the ISO’s requirements since the ISO is seeking backstop procurement authority for resources that are able to provide flexible capacity. Additionally, the ISO must consider how a resource’s current RA status should be considered when evaluating needs in years beyond the current RA compliance year.

5.2.1 Resource Adequacy Status

When establishing which resources are eligible for CPM awards under a risk of retirement procurement, the ISO must determine if it is appropriate to only allow resources that do not currently have a RA contract for the current RA compliance year and any year moving forward to request a CPM award or allow resources that do not have a RA contract in the year in which

¹⁴ CPUC RA scoping memo at <http://docs.cpuc.ca.gov/efile/RULC/156371.pdf>.

a deficiency is forecast to apply as well. While a pool of resources that do not have any RA contract likely represents the resources most at risk of retirement, restricting the eligibility options to these resources may not fully address the risk of retirement concerns of the ISO. Additionally, using the smaller pool of resources may be discriminate against resources that currently have RA contracts.

5.2.2 Use Limited Resources

Use limited resources raise unique questions for the ISO. While these resources may have rapid ramping capabilities and locational benefits, they may not be available during all hours when the ISO needs ramp capability. For example, ISO studies show an increased need for ramping capabilities in shoulder months. It is possible that the ISO would need these resources for spring ramps, using all a resource's hours before summer peaks or fall ramps.

5.2.3 Interties

The ISO must carefully consider how interties are able to provide ramping capacity. To a certain degree, the ISO receives limited information from resources that bid and schedule at interties. This limited visibility creates challenges for the ISO when considering how to procure flexible capacity. Dynamically scheduled resources and resources at pseudo-ties provide the ISO with greater visibility and provide greater assurances that the ISO has procured capacity that will provide the needed flexibility.

5.3 Selection Criteria

The ISO must establish well defined criteria by which resources are selected for risk of retirement or RA backstop procurement. However, establishing these criteria requires the ISO to balance several different attributes of resources. Depending on the modifications made to the CPUC's and other LRAs procurement requirement, the selection criteria for risk of retirement and RA backstop may need to be somewhat different.¹⁵ Decision made with regards to the items outlined in Section 4.1 and 4.2 above are relevant in the selection criteria. However, the most important criteria will be a resources ability to provide the proper ramping capabilities.

As detailed the ISO's proposal in the CPUC's RA proceeding, there are three types of ramping capabilities the ISO will need to continue reliably operating the grid: Maximum Ramping, Load Following, and Regulation. If backstop procurement is needed, the ISO will focus on procuring

¹⁵ The primary difference may be the result of different procurement time horizons. For example, if risk of retirement looks at a five year horizon, but backstop currently only looks at a single year horizon.

the resources that are able to provide the proper capabilities, but will also consider the full set of capabilities to maximize the value of the backstop procurement.

5.4 Price and Cost Allocation

The ISO believes that price and cost allocation are core components of any backstop procurement mechanism. Furthermore, the ISO believes that, when possible, costs should be allocated to those that are deficient and require the ISO to exercise its backstop procurement authority. Secondly, the ISO believes it is appropriate to minimize the use of and the cost of backstop procurement. As such, ISO believes that LSEs should first have an opportunity to cure any identified procurement deficiencies. The ISO aims to provide incentives that adequately address the ISO's capacity needs while allowing LSEs and resource owners to come to a mutually agreeable resolution that may include long term energy and capacity solutions. Therefore, the ISO must determine not only the proper price to pay for capacity, but also must determine the proper payment schedule (time period over which a resource receives payment) and the obligations that apply to resources that receive an ISO capacity award. For example, if a resource is at risk of retiring and the ISO determines the resource is needed in four years, is it appropriate to pay the resource today or put in place an agreement for year four? Additionally, if the ISO offers a capacity award to a resource in year four, are there any performance requirements (must-offer obligations) for the first three years. The following provides greater detail regarding the correct price for backstopping flexible capacity and cost allocation for this procurement.

5.4.1 *Determining the Correct Price*

The focus of this initiative is backstop procurement authority for flexible capacity for deficiencies in the current year RA requirements and for units at risk of retirement. Therefore, the ISO must determine what is a just and reasonable rate to pay flexible resources for providing the specific flexibility requirement and how to establish this price. However, the goal of this backstop procurement authority is not to incent investment in new capacity, but focuses on maintaining existing capacity.

Some of the backstop procurement decisions will be based on forecasted need beyond the current RA compliance year (i.e. risk of retirement). Therefore the ISO must determine how resources should be compensated for providing flexible capacity for these future capacity needs. One option for compensation is graduated payments that eventually reach a fixed level by the year of need. Such a payment schedule could still provide an opportunity for LSE's to contract with a resource prior to the time of the forecasted deficiency. Another option includes full upfront payment when the need is identified. Such an arrangement would require assurances that the resource would be, at a minimum, available in the year of the forecasted

need. While, it is not clear that such a provision is necessary, the ISO also wishes to consider the need for a clawback provision for backstop capacity payment if a resource eventually receives and RA contract. If the ISO uses a clawback provision, is it reasonable to consider the clawback of all payments or only portion. Additionally, under a clawback mechanism, the ISO must consider how to address the risk that a resource is not available for the year for which the capacity had been procured.

5.4.2 Cost Allocation

As noted above, when possible the ISO believes it is important to allocate the costs of backstopping flexible capacity to the entity that causes the ISO to use its backstop procurement authority. The manner in which this allocation occurs will depend greatly on the modifications made in the CPUC's current RA proceeding (R.11-10-023) and other LRAs' procurement requirements. If annual flexible capacity requirements are set for each LSE, then the ISO is able to identify entities that are deficient and allocate costs to those entities. The further into the future these requirements are set, the further out the ISO can assess how to properly allocate these costs.

Resources at risk of retirement may pose a different challenge than backstopping RA flexibility deficiencies for cost allocation. Important resources may be at risk of retirement even if all entities have procured up to their established flexible capacity requirements. In this case, the ISO may not be able to determine that a single entity is at fault for the needed backstop award. One possible solution to this situation would be to allocate the cost of this backstop procurement to all LSEs/LRAs, as is done with the CPM. Therefore, the ISO may require separate cost allocation methodologies for risk of retirement and flexible capacity requirement deficiencies.

5.4.3 Resource Obligations

Because some resources will be procured several years before the identified need, it is also important to address the obligations of these resources in the interim. At this time, it is not clear that a resource receiving a backstop capacity award for a year beyond the current RA compliance year should be subject to requirements such as a must offer obligation in the current RA compliance year. However, there may be other requirements/showings that must be made that ensure a resource will be available for the contracted year (i.e. annual operational demonstration).

5.5 Contract Duration

Because the ISO may forecast a need for multiple years in the future, the ISO must consider the proper duration of a backstop capacity award. For example, if the ISO forecasts that a resource

at risk of retirement is needed in years four and five, should the ISO consider offering this resource a two year backstop award? Alternatively, the ISO could make a single year award for year four, leaving year five to be addressed closer to real time. While, the second option may provide greater incentives for LSEs and the resource to reach a mutually agreeable solution that could include year five, it still leaves the resource at risk of retirement for year five. The ISO is aware, however, that awarding multiyear backstop capacity awards may impact the incentives for LSE and resources to negotiate long term contract solutions. The ISO must also consider relying primarily on single year contracts, but including stipulations for cases of extreme need to offer longer term contracts to resources that can demonstrate extreme distress.

5.6 Others

The ISO has identified numerous matters that must be resolved. However, there are likely others that have not been captured in this issue paper. The ISO seeks stakeholder feedback regarding other issues that may need to be resolved as a part of this initiative.

6 Next Steps

The ISO will host a stakeholder meeting on February 6th, 2012 to discuss the contents of this Issue Paper. Additionally, the ISO appreciates that this is a complex matter with far reaching implications. As such, stakeholder comments on this issue paper will be due February 16th, 2012. The ISO will issue a straw proposal on this matter in early March 2012 and anticipates seeking Board Approval at the July Board Meeting.