

Center for Energy Efficiency and Renewable Technologies
Comments on the California ISO
Cost Allocation Guiding Principles, Draft Final Proposal and the
Flexible Ramping Product Cost Allocation, Straw Proposal of
March 19, 2012

Submitted by:	Company	Date Submitted
David Miller david@ceert.org 916-340-2638 James H. Caldwell Jr. jhcaldwelljr@gmail.com	Center for Energy Efficiency and Renewable Technologies	March 29, 2012

The Center for Energy Efficiency and Renewable Technologies (CEERT) appreciates the opportunity to comment on the CAISO's Cost Allocation Guiding Principles, Draft Final Proposal and the Flexible Ramping Product Cost Allocation, Straw Proposal of March 19, 2012.

Why do we need a Flexible Ramping Product? Before commenting on the draft final cost allocation guiding principles and its application to the Flexible Ramping Product (FRP), CEERT would like to register our significant concerns regarding the very necessity of the FRP. CEERT does not believe that the CAISO has sufficiently demonstrated the need for the FRP. California utility customers already pay a significant premium to generation resources in the form of capacity payments. The purpose of these capacity payments is to ensure that sufficient resources are available in real time to reliably serve load. The costs associated with the proposed FRP will not reduce existing capacity payments, but may instead represent an additional premium that will ultimately be borne by utility customers. CEERT has significant concerns that costs associated with the FRP are not easily calculated and in fact will not be known until after the FRP market is operational. FRP is a brand new product that has never been tested or even simulated, so the charges that such a market will incur are completely unknown at this time. In addition, the uncertainty and risk that these additional costs will add to the procurement of VERs will not only impede development of new resources but will greatly increase system costs that will ultimately be paid by utility customers. Existing Power Purchase Agreements (PPAs) will also be exposed to ex post costs that may compromise original contractual terms. We also have grave concerns that given its significant complexity, the FRP will be vulnerable to gaming opportunities or unintended consequences that will expose developers and utility customers to additional and unacceptable risk.

While we recognize that increasing VER penetration adds operational challenges to the grid operator, market enhancements such as the Flexible Ramping Constraint (FRC) that currently exists within the CAISO market perform the same function as the proposed FRP. However the FRC can easily and more transparently manage flexible ramping needs for the CAISO, as it is currently doing. Furthermore, and more importantly, we do not believe that the addition of a real

time market for flexible ramping capacity will adequately serve California utility customers. A modified and integrated Resource Adequacy (RA) and Long Term Procurement Process (LTPP) at the California Public Utilities Commission (CPUC) will serve the same function with less complexity and with reduced cost and risk. We therefore question the very need for the FRP product. The CAISO needs to clearly demonstrate the need for the FRP and provide realistic estimates of expected costs and uncertainties in procurement and utility customer exposure before continuing in the development of this new market product. Because of this, any discussion of applying cost allocation principles to this product are premature.

Generators Receiving RA Payments Should Bid Economically: Within the CAISO BA, only around 10% of all energy products are economically bid into the market. Therefore there is not a robust 5 minute dispatch stack to serve load. It might therefore be argued that the CAISO has been compelled to develop a more complex market structure (Real Time Pre Dispatch – RTPD) precisely because of its shallow dispatch stack. Why not instead just develop a deeper 5 minute dispatch stack based on capacity that utility customers are already paying for? For example, if resources accepting capacity payments were required to bid economically, then there would be a much deeper 5 minute dispatch stack that could potentially manage grid variability more efficiently than an FRP. Clearly the CPUC's RA and LTPP processes will need to evolve in conjunction with ongoing modeling efforts by the CAISO in order to ensure an evolving generation stack with the appropriate operational characteristics. And naturally, as VER penetration increases, and as demand side management resources mature, the fleet of resources and the nature of these capacity payments could coevolve. And unlike FRP, such a system is significantly less complex and hence more transparent. As ramping needs evolve, so too will our understanding of the grid and our ability to ensure that such operational characteristics show up in real time, with transparent payment for such services. We invoke Occam's razor here: Why develop a complex solution such as the FRP with its concomitant cost, uncertainty and lack of transparency when a simpler and highly functional energy service market, with some form of the FRC enhancement to handle those rare "extreme ramping events," already exists?

Without a "Perfect" Cost Allocation Mechanism, Gaming Opportunities Will Exist and Be Exploited: CEERT has significant concerns that the CAISO may be about to embark on a partial repeat of the California energy crisis of 2001. At that time, market manipulation became possible as a result of a complex market design produced by the process of partial deregulation. We believe that introducing a new and incredibly complex market such as FRP may lead to gaming opportunities which will take a significant amount of time to address once the tariff has been put into effect at FERC. Several real options exist for gaming the system: Resources could either "pretend" to supply flexibility while avoiding the consequences of CAISO dispatch, or actively work to increase the demand for flexibility by "strategic bidding" of some portion of their portfolio against the prevailing ramp which can then be mitigated with more expensive and more profitable resources. Regardless of the precise arbitrage mechanism, without a "perfect" cost allocation methodology, any available arbitrage opportunities will be exploited for private advantage against the public good.

A System Designed with Sufficient Flexibility Including a Robust DSM Program

Precludes the Need for the FRP: If and only if the system is designed to proactively ensure that there is enough "flexibility" in new resources that will replace retiring OTC plants and foregone coal contracts, and if and only if such resources are appropriately compensated for their "cycling costs" – while not giving them an unfair competitive advantage relative to their "competitors" in the dispatch stack by allowing a select number of them to avoid these cycling costs by self-scheduling (i.e. forcing them to recover marginal cycling costs in the energy market if and only if they are actually called and thus if and only if they actually incur those costs) – then the FRP market becomes unnecessary. Any out of merit order dispatch during the rare but real "extreme ramping events" can be compensated through the existing FRC. Then with the addition of a cost effective supply of "flexibility" provided through a robust DSM program, the whole cost allocation argument is mostly solved. All integration costs can then be expressed as some fraction of real FRC costs and real RA payments. It would then be possible to rationally deliberate over what is the appropriate fraction of real system costs for these ancillary services that could potentially be assigned to VERs, and what is a defensible billing determinant to charge individual projects for these collective costs that works for all resources contributing to these costs, including load and base load generation.

A “Real Time” Capacity Market May Increase the Demand for Flexibility by Assuming it is Required as a Separate Good in Each and Every Hour:

On the other hand, if the CAISO proceeds with the FRP and a real time capacity market, the demand for "flexibility" will be increased by assuming that it is required as a separate good in each and every hour and always having it on hand at a maximum level "just in case," as well as reducing the supply by restricting it only to those resources that can meet a semi-arbitrary product definition.

The Need for Flexible Ramping Capacity: CEERT recognizes that flexible ramping capacity is a very real and growing need of the system operator to manage increasing VER penetration. However, we believe the problem is mostly in the planning rather than the operational arena. At the very time that the demand for more grid flexibility is increasing, the supply is potentially decreasing as the resources that currently supply flexibility retire due to age and state policy to eliminate once through cooling. It is imperative that the replacement resources be designed and constructed with flexibility as a defining attribute and that they offer this flexibility to the market in order to receive RA capacity payments.

Moreover, we believe that these needs can be more transparently managed in real time by an FRC, as currently exists within the CAISO market, and in the longer term by a coordinated Resource Adequacy (RA) and Long Term Procurement Process (LTPP) at the California Public Utilities Commission (CPUC) that balances the need for fast ramping dispatchable resources with the levels of system VER penetration in a manner that is consistent with increasingly accurate modeling and forecasting tools that the CAISO is developing, along with the increasing real time experience of the system operator in managing these resources.

The Recently Proposed CPUC Modification to the RA Process Addresses the Need for Flexible Resources: The CPUC has recently proposed developing a revised RA process in which Maximum Cumulative Capacity (MCC) buckets would not be based solely on contractual hours of operation but would also be distinguished on operational dispatchability.¹ CEERT agrees with the basic premise of this CPUC proposal. It provides a basis for distinguishing different ‘flavors’ of capacity in a manner that can also be incorporated into revised LTPP and RA processes. By distinguishing different types of capacity, the RA proposal would provide a mechanism for capacity payments to resources commensurate with their value to the system.

A market based FRP would also offer a mechanism for valuing resources able to provide value to the system in real time. And while we recognize the appeal of a market based approach, we question the need for the addition of this costly, opaque and complex solution when a simpler approach would provide a more direct solution. Moreover, adding such a complex solution on top of a dysfunctional LTPP/RA process would still not necessarily solve the underlying problem: It is highly questionable whether an FRP market would properly incentivize development of critical fast ramping resources if the underlying LTPP/RA process is not already aligned with evolving CAISO forecasts. And if the LTPP/RA process is aligned with CAISO forecasts, and additionally and critically, if those resources receiving capacity payments are required to bid economically, then the proper mix of resources will be available to the CAISO in real time to reliably and cost effectively serve load. CEERT appeals to the notion that if a simpler, more transparent system is able to provide the same system benefit at reduced cost, and if the more complex solution still does not address the underlying dysfunction, then what is the real value of the FRP? If the CAISO is intent on implementing the FRP, then California utility customers should recognize that a redundant mechanism is being put into place for incentivizing fast ramping resources, one that we argue will not even guarantee such resources will be available to the market, and moreover one that will greatly increase utility customer costs and developer risk.

What is the Benefit of FRP over FRC? The FRC is a feature that currently exists within the CAISO market to aid in the management of increased VER penetration. The FRC works by dispatching generation out of merit order in order to preserve flexible ramping capacity for subsequent periods. Resources are compensated by paying them for their opportunity cost of preserving ramping capacity for use in the next period. The quantity of preserved flexible ramping capacity is chosen by the system operator in order to manage forecast uncertainty between the Real Time Pre Dispatch (RTPD) (15 minute look ahead) and Real Time Dispatch (RTD) (5 minute look ahead) processes. The FRP is essentially a market based approach that performs a similar function as the FRC. Instead of optimizing flexible ramping capacity needs based on energy bids from the Hour Ahead Scheduling Process (HASP) and resource operational characteristics, FRP utilizes explicit flexible ramping capacity bids submitted in HASP and additionally operates in the Day Ahead (DA) market. Given that the stated need for both FRC and FRP is to minimize forecast uncertainty between RTPD and RTD, there is little

¹ CPUC Docket R.11-10-023, Attachment, Filed March 23, 2012, “Energy Division Report, Resource Adequacy Workshop, January 26 – 27, 2012”

reason to believe that the proposed FRP will perform any better than the existing FRC. The main advantage of the FRP appears to be that it provides a more transparent way in which to allocate the costs of this product to market participants. However the underlying costs of the FRP market are still not transparent, and without a significant simulation effort, can only be determined once the FRP market is operational. Furthermore, the complexity of FRP may lead to gaming opportunities. CEERT believes the appropriate question to ask at this time is whether the additional risk and cost of developing and operating the FRP is worth the perceived benefit of having a transparent cost allocation mechanism.

The Midwest ISO (MISO) is currently contemplating a feature that similar to the FRC in order to reduce periods of occasional scarcity pricing.² Their premise is that an FRC will actually benefit overall load, even if energy prices are slightly increased for some hours by the minor out of merit order dispatch and the subsequent make-whole payments. MISO believes that the total cost of serving load will be decreased with an FRC because the few (but very expensive) hours of ramping scarcity are reduced. Under this philosophy, it would not make any sense to allocate the "cost" of the ramping constrain to anyone because the overall cost of serving load is reduced.

Within the CAISO market, lack of sufficient RTD resources means that the system has to rely on regulation services to resolve imbalance issues in real time after the imbalance has caused frequency deviation or area control error (ACE). If there is insufficient regulation service, the result of insufficient ramping capability may result in leaning on the inerties. In the CAISO, when power balance is violated, the RTD energy price is not priced by economic bids, but by administrative penalty prices, similar to the scarcity pricing experienced by the MISO system under similar situations. It is therefore not unreasonable to assume that the same benefit to overall load which is anticipated in the MISO market as a result of their FRC will also occur in the CAISO market under similar circumstances.

Therefore we conclude that the FRC should act as a system benefit, not a cost. The fact that the CAISO is asking us to accept the FRP as a system cost is a strong indication of a market inefficiency. Clearly, if both FRC and FRP offer the system the same ability to preserve ramping capacity in the current period to serve load in the next period, but one acts as a system benefit while the other acts as a system cost, then it should be clear that the market based solution is not providing a system benefit. And while we understand that there are compelling arguments for a market based FRP over the more simple FRC, unless the FRP can provide a net system benefit like the FRC offers, there would seem to be no point in pursuing an FRP. However, the underlying problem may be the lack of a sufficiently deep dispatch stack of resources with appropriate operational characteristics.

² "Ramp Capability for Load Following in the MISO Markets, Version 1.0," N. Navid, G. Rosenwald and D. Chatterjee, July 15, 2011

The Cost Allocation Principles Proposed by CAISO are Not Being Applied to FRP in a Just and Reasonable Manner: Specifically, we believe that three of the principles are being violated when applied to the FRP:

Incentivize: The CAISO “Incentivize” principle states that “...Cost allocation should incent proper behavior by market participants.” As we have pointed out in prior comments, the output of Variable Energy Resources (VERs) is variable and uncertain precisely because of fluctuations in, and incomplete knowledge of, weather patterns. Such physical attributes will directly affect aspects of their output characteristics in a manner that is completely outside of their control. For this reason, charging VERs for the integration costs that they impose on the system due to variability and uncertainty in their output that is physically outside of their control will not in any way incentivize improvements in their market performance. Such a charge is simply punitive in nature. Furthermore, such charges will simply add an unnecessary transactional cost that will impede the development and operation of these vital and policy driven resources, a cost that will ultimately be borne by load, regardless of the mechanism by which it is allocated.

Comparable Treatment: The “Comparable Treatment” principle would suggest that the CAISO is applying these principles across all ancillary services. It is interesting to note that CAISO markets do not currently allocate costs based on cost causation. Rather, costs for ancillary services in the CAISO markets are currently based on hourly energy consumption, which do not reflect actual costs to the system nor do they incentivize market participants to reduce these costs. Accordingly, if the CAISO wants to allocate costs based on cost causation in a just and reasonable manner, then it needs to apply this principle across all generators and across all ancillary services. Simply developing cost allocation rules and applying them to the new proposed flexible ramping product will disproportionately and unfairly impact VERs, while at the same time overlooking the historical allocation of all other ancillary service costs to load. Such a treatment would be per se discriminatory. While the CAISO has suggested that it will develop cost allocation models across additional ancillary services, we see the immediate application to the FRP as unduly discriminatory.

Accurate Price Signals: The “Accurate Price Signals” principle suggests that any cost allocation mechanism should “...support the economically efficient achievement of state and federal policy goals.” In fact, implementation of the proposed flexible ramping cost allocation mechanism will add costs to and increase uncertainty and risk of existing and proposed VER projects. We therefore believe that implementation of this cost allocation mechanism, contrary to the stated purpose of this principle, will instead greatly impede development of these vital state mandated VER resources.

We therefore categorically reject the notion that the CAISO’s cost allocation principles are being applied in a just and reasonable manner to the FRP.

Costs Should Be Allocated to PPA Purchasers: Should the CAISO proceed with the flexible ramping product cost allocation proposal, then we are concerned that costs allocated to VERs

on a per resource basis will result in excessive pricing uncertainty that will be difficult for these resources to mitigate. Given that the price of FRP cost allocation is currently unknown, and given there is no existing mechanism to account for such costs either in the RA or LTPP processes, we are concerned that such ex post costs applied to VERs may impede development of these resources and greatly complicate compliance with the PPAs of existing resources. For these reasons we support allocating any allocated costs to the PPA purchaser, who is better situated to manage such costs.

Any Cost Allocation Mechanism Needs to Account for Benefits of Aggregating VER

Variability: VERs are fundamentally different from conventional resources in that the variability of individual VERs will tend to be uncorrelated with other similar resources across large geographical distances. This is due to the fact that weather patterns tend to be uncorrelated across large regions. In addition, the output characteristics of different VER technologies may complement each other in a manner that reduces overall system variability. For this reason, we see the CAISO's proposal to allocate flexible ramping costs on a per resource basis to be unduly discriminatory. Moreover, such an approach will overlook a key feature of VERs that, when recognized, could translate into significant reductions in integration costs and result in utility customer savings.

The CAISO has proposed to use the RTPD demand forecast as the baseline for measuring load deviations, while measuring generation deviations on an individual resource basis. This seems unduly discriminatory to generators, and especially to VERs which will disproportionately drive FRP costs: Why does fully aggregating load across the BA make sense when generation deviations are measured on an individual resource basis?

The benefit of spatial diversity is included in the proposed procurement of FRP by the CAISO. So VERs and utility customers will benefit in the determination of FRP need, because there is less overall FRP procured and less cost to be allocated. However, in the allocation of costs, the same level of aggregation should exist for load and generation. Otherwise spatial diversity is not considered in the allocation of costs. Also, deviations should count only in the direction of net need over the course of the month. This is important, because it will help distinguish between VERs that have high correlation with overall need and VERs that may be variable, but have a low correlation with overall need.

Conclusion: While CEERT concurs with the CAISO that provision of flexible ramping capacity is an important problem that must be dealt with in order to cost effectively provide grid reliability, we believe that the proposed FRP product is a complicated, expensive, opaque and uncertain solution to the wrong problem. Because of this, any discussion of applying cost allocation principles to this product are premature.

There are two problems that need to be addressed in order to ensure sufficient flexible ramping capacity exists to the system operator. First, without explicit intervention at the CEC siting process and at the CPUC RA and LTPP processes, the existing supply of ramping capability is likely to decrease as the resources that have supplied California with ramping capability for

several decades “for free” are retired. Flexibility is not an inherent attribute of modern combined cycle natural gas plants and must be designed into the plant at a modest but real cost and accounted for in the new plant operating permits with modest but real consequences for fuel efficiency and plant emissions, principally NOx. Furthermore, the time and energy involved in designing a new FRP product and market with no real world experience to guide the process would be better spent in the proven strategy of designing programs that would allow demand side resources to provide cost effective grid flexibility. Second, the actual delivery of flexibility causes the “flexible” facility to incur modest but real operational costs as compared to when the resource is self scheduled. The existing RA contract modified to require economic bidding in order to receive RA payments provides a transparent, known method of providing compensation for provision of these services. Furthermore, the existing FRC tariff provisions could provide an appropriate mechanism to compensate operators for the occasional out of merit order dispatch during extreme ramping event, without incurring excess costs “just in case” scarcity might appear in the real time dispatch stack.

CEERT maintains that these problems must be solved regardless of the details of the CAISO market design. FRP is not a solution to these very real issues. Experience in Balancing Authorities around the world, many with higher VERs penetration than contemplated in California, does not support the need for a novel concept such as FRP. CEERT respectfully maintains that these real problems need to be solved first. There is plenty of time to worry about details of execution or fine tuning cost allocation among generators later.