Draft Final Proposal
For the Design of Proxy Demand Resource (PDR)

April 26, 2009

Design of PDR and Direct Participation

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1. Executive Summary

The California ISO (the ISO) has been working on enhancements to enable greater participation by Demand Response in the ISO's wholesale energy market. The enhancements that the ISO is proposing to be implemented by May 2010 are as follows:

- Refinements to existing Participating Load functionality that exists at MRTU start-up to allow for a single integrated Demand Response resource that may be co-optimized in the CAISO Energy and Ancillary Services Markets
- Proxy Demand Resource (PDR) which is a new Demand Response product offering designed to meet the new requirements for Demand Response set by the Federal Energy Regulatory Commission (FERC) in FERC Order[1]

This Draft Final Proposal explains the PDR product and how the PDR design is consistent with FERC Order 719. Refinements to functionality that are proposed to the ISO's existing Participating Load model are described in a separate document posted on the ISO website at:

http://www.caiso.com/2070/2070c79e59140.pdf

FERC Order 719, which was issued in October of 2008, requires that ISOs permit a DR aggregator also known as a Curtailment Service Provider (CSP) to bid demand response on behalf of retail customers into the organized energy markets. The ISO and its stakeholders use the term "direct participation" to convey this concept of a DR aggregator bidding DR resources directly into the ISO's wholesale electricity markets.

In response to the FERC Order 719 requirements as well as the request from market participants for a product that would better accommodate existing Demand Response retail programs; the ISO developed the concept of the PDR product. The proposed PDR product was developed based on feedback from market participants that the Participating Load functionality available at MRTU start-up and the proposed refinements to Participating Load did not provide flexibility needed to incorporate price responsive Demand Response programs into the ISO markets. Specifically, the PDR Product addresses the following challenges:

- Allows the Curtailment Service Provider (CSP) to bid Demand Response directly into the ISO's energy and ancillary service markets and to participate separately from the Load Serving Entity (LSE) as required by FERC Order 719
- Allows retail DR programs that are imbedded as part of the Investor-Owned Utility's (IOU) load to participate in the ISO's energy and ancillary services markets through a market bid rather than through a manual process which is the done presently.

[1] FERC Final Rule re Wholesale Competition in Regions with Organized Electric Markets (125 FERC ¶ 61,071) (issued in Docket Nos. RM07-19-000 and AD07-7-000 on October 17, 2008) (hereinafter "FERC Oct 17 Final Rule"). Appendix A to this document summarizes the relevant sections of Order 719 pertaining to the direct participation by ARCs

- Does not require the base load associated with the DR resource or program to be pulled out and uniquely forecast and scheduled at the CLAP[2] which posed a barrier for market participant participation.[3] In response, the PDR product enables the underlying base load associated with the DR resource or program to be embedded in the LSE's overall load schedule at the Default LAP level, while a separate bid for DR, represented as a proxy-generator, will represent the price-responsive demand within a Custom LAP.

This Draft Final proposal for PDR was developed jointly by the ISO and a stakeholder formed working group[4] through a series of stakeholder and working group meetings that took place from November 2008 through April 2009.

A Straw Proposal for PDR and Impacts of Direct Participation was posted on March 5, and further discussed at a combined Market Steering Committee (MSC) and Stakeholder Meeting held on March 12th. Stakeholder submitted written comments on March 20th that were reviewed and incorporated into this Draft Final Proposal.

The ISO will seek board approval on the conceptual design of PDR in May 2009. A stakeholder process will continue after that time up through August 2009 to determine requirements and business processes for the seven key areas that are impacted by FERC Order 719 direct participation requirements as they relate to the design of PDR. The Straw Proposal posted on March 5th included both the conceptual proposal for PDR and a discussion on the impacts of FERC Order 719 direct participation requirements in a single document. Since the direct participation requirements will be further refined later, this Draft Final Proposal includes only the conceptual proposal for PDR and, therefore, the impacts of direct participation are now included in a separate document entitled Straw Proposal for Direct Participation of Proxy Demand Resource (PDR) posted at:

http://www.caiso.com/1893/1893e350393b0.html

This Draft Final Proposal contains the following revisions from the April 15th version:

- Page 22- corrected references to Diagram 6
- Page 25 - clarified that measures to mitigate gaming concerns are proposed as initial starting point to be re-evaluated after summer 2010.
- Page 26 – added tariff reference for requirement under Qualification that discusses requirements around emergency demand response programs
- Page 27- deleted requirement from notification section that CSP needs to be aware of the amount of demand being scheduled by the LSE
- Page 30 – specified that written stakeholder comments must be received by close of business April 29 to be included in the documents for the ISO Board.

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[2] A CLAP is an aggregation of Load PNodes created by the CAISO based on a set of custom LDFs submitted by a Scheduling Coordinator, at which such Scheduling Coordinator may submit a single Bid and settle Demand consistent with the CAISO Tariff rules, and for which the Scheduling Coordinator is required to submit to the CAISO Meter Data for the nodal Load represented in such aggregation

[3] Stakeholders conveyed that it would be burdensome and difficult to forecast and schedule load at the granularity of a customer or group of aggregated customers.

4 Specifically, the stakeholder formed working group consisted of representatives from PG&E, SCE, SDG&E, the CPUC, Enernoc, AReM, EUF and CMTA.

2. Stakeholder Effort

The table below summarizes the key steps that have been conducted in the stakeholder process on Proxy Demand Resource. All the documents referenced in the table, as well as Stakeholder comments, and meeting and conference call presentations are available on the ISO website at the following link:

http://www.caiso.com/1893/1893e350393b0.html

November 5, 2008	Demand Response Stakeholder Meeting
December 22, 2008	Issue Paper on Direct Participation posted
January 5, 2009	Stakeholder Conference Call
January 12, 2009	Stakeholder Comments Due on Issue Paper
January 15, 2009	Demand Response Stakeholder Meeting
February 9, February 20, February 25 , 2009	Working Group meetings to resolve PDR design
February 27, 2009	Stakeholder Conference Call
March 5, 2009	PDR Straw Proposal posted
March 12, 2009	MSC/Stakeholder Meeting
March 19, 2009	Stakeholder Comment Due on Straw Proposal
March 20 , 2009	Stakeholder Conference Call
April 14 , 2009	Draft Final Proposal posted
April 22, 2009	Stakeholder Conference Call
April 24, 2009	Stakeholder Comments Due on Draft Final Proposal
May 19 -20. 2009	Board of Governors Meeting
April – August 2009	Stakeholder process on further defining direct participation requirements

Summary of Stakeholder Comments

Stakeholders submitted comments to the Straw Proposal on PDR and Direct Participation on March 20th. Stakeholders gave their support in written comments for the conceptual design of PDR and also recognized that there is still work to be done to refine and implement the direct participation requirements. Stakeholder comments are summarized below:

Market Participant	Comments	ISO Response
CPUC	The CPUC staff supports the conceptual PDR product laid	The ISO plans to use the CPUC baselines as a starting point for

	out in the Straw Proposal. CPUC staff also supports CAISO using the CPUC baseline methodologies as a starting point for further analysis, but believes that that this is an issue that requires additional stakeholder discussion before making a final determination. Many of the issues raised in the Straw Proposal are either issues that are CPUC jurisdictional and/or would greatly benefit from coordinated efforts across the CPUC and CAISO. Therefore, CPUC staff will work with CAISO staff to resolve issues so that PDR can be used effectively and will not conflict with CPUC authorized retail based DR programs. The CPUC staff supports the PDR-A Option (hereafter, PDR). Though the "money machine" gaming concern is a legitimate concern, CPUC staff agrees with CAISO that this matter should be subject to resolution through product design.	stakeholder discussion and analysis and will make the final determination after working with stakeholders through a series of meetings that will take place from April – August. The ISO agrees that coordinated efforts between the ISO and CPUC are needed to ensure compatibility of the PDR design with the retail DR programs.
SCE	SCE is supportive of the Straw Proposal for the design of Proxy Demand Resource thus far. SCE believes the current Straw Proposal for PDR satisfactorily motivates demand response resources to compete with supply in developing additional resources in high priced areas while at the same time allows for direct participation as required by FERC Order 719. SCE also encourages CAISO to temporarily postpone plans to introduce additional DR products. SCE feels that now is	The ISO will implement the needed refinements to complete the existing Participating Load design as designed for MRTU and ordered by FERC, but will introduce no additional DR products other than PDR at this time. Stakeholder efforts will be focused solely on PDR for the next several months.

	the right time for market participants to solidify their understanding of PDR and prepare this new resource to play in the product framework. SCE reiterates its belief that there are three aspects to mitigation of the gaming concerns: A good baseline will reduce gaming opportunity significantly; a price bid threshold will eliminate ability to participate as "price taker" and reduce predictability of dispatch; Limited availability of the resources likely to participate as a PDR are supportive of strong correlation between loads and prices. The risk of a customer inflating their usage tocapture PDR payments is further mitigated since customers would pay for their increased load, intended to increase their baseline, with no guarantee that the PDR bid would be accepted or dispatched.	
AReM	AReM supports the direction of the CAISO and further development of the PDR concept outlined in the Straw Proposal. AReM intends to work closely with CAISO staff and stakeholders to ensure that the final CAISO rules and protocols are flexible and workable for both end use customers and the LSEs that serve them. AReM is concerned that the CAISO's proposed schedule is overly ambitious. While we understand the commitment to implement PDR by May 2010,	The details of the business processes that support direct participation will continue to be addressed through a stakeholder process after the May board meeting. The board will be approving the conceptual design of PDR and not setting in stone the implementation details around direct participation requirements.

	there needs to be ample time to address policy options before they are set in stone by a Board vote. The CAISO should allow more time for an upfront stakeholder process to resolve policy issues and, if needed, consider delaying the Board vote to July	
CDWR	Gaming opportunities, i.e. "money machine" scenarios, remain unsolved with CAISO's current design for PDR The solution is to have an identical level of settlement for Demand and DR, whether that level is at the DLAP, Sub-LAP, CLAP, or PNode. In the current proposal for PDR, Demand is bid and settled at the DLAP while DR is bid and settled at the CLAP. Per the CAISO presentation, PDR has "no requirement for underlying load associated with DR resource or program to be uniquely forecast and scheduled at CLAP"; this fact has created a "loophole." The assumed price difference between these settlement locations provides a weakness in the design that can be exploited. These problems can be resolved by eliminating the separate levels for settlement of Demand and DR.	The ISO believes that gaming opportunities with PDR are limited for the reasons described in Section 5 of this proposal. Implementing direct participation requirements of allowing the CSP and LSE to participate as separate entities presented challenges in settling the Demand and DR at the same level as customers participating in DR retail programs bid in by a CSP may belong to multiple LSE's or ESPs and it is not necessarily feasible for those entities to move all of their base load to the Sub-LAP or CLAP level to accommodate a portion of load that is demand response. On the other hand, settling the Demand Response at the Default LAP along with the base load did not promote Demand Response towards high prices areas.
PG&E	The straw proposal is a very complete and well developed document. The team that put it together has done a excellent job. However, a lot of work and discussion is needed to finalize this document. It is important that the CAISO issue a detailed schedule for the deliverables and meetings	A detailed schedule for completion of the requirements around direct participation will be provided to stakeholders at the April 30th stakeholder meeting.

	to accomplish this work.	
CMTA, CHA, EUF	The benefits of the PDRA proposal are that (1) payments will be based on performance not bids, (2) settlements will be no more complex than necessary for the customer because the ISO pays the CSP per the bids without funneling money off for the ESP, (3) payments will be at least as much as the bid so the risk that payments could be lower because locations used were different, markets bid and paid were different or the amount settled was different than the amount produced are not an issue. Furthermore, under PDR A, the ISO does not insert itself into the contractual relationship between a customer and its CSP and a customer and its LSE. The ISO originally presented Dynamic Demand Resource (DDR) and PDR jointly. However, DDR is much more complex, engenders many more concerns and was opposed by a significant number stakeholders and a majority of the PDR working group as presented. We do not oppose upgrades to the Participating Load tariff meant to eliminate manual workarounds and integrate it with the MRTU platform. However, we oppose changes to the Participating Load tariff meant to increase participation before a thorough review of the design and gaming is conducted by the working group and mitigation for potential gaming is developed. Furthermore, the	The ISO will evaluate how direct participation could work with the Participating Load model after PDR is implemented and the ISO and market participants can gain some experience with direct participation. The proposal for DDR involves refinements to the existing Participating Load model to eliminate manual workarounds that exist at MRTU start-up. The ISO has received FERC direction to move forward with these enhancements and ISO Board approval as part of the MRTU design.

	expected benefits of DDR/Expanded PL must be weighed against the expected amount of structural cost shifting. PL/DDR must provide for direct participation in the future, if PL/DDR is to be allowed. A learning period with PDR is reasonable, but it is discriminatory and does not provide "equal access" if some CSPs are not allowed to provide DDR based products.	

3. Background on Development of PDR Proposal

The PDR model is intended to make it easier to administer end-use customer participation, and lessen the coordination requirements of forecasting, scheduling and curtailing load within CLAPs by separate entities, i.e. the Curtailment Service Providers and the Load Serving Entities.

In the January 15th Stakeholder Meeting, three options for the design of PDR were presented to market participants. Those options included:

1. PDR Option 1

Under the PDR 1 proposal, the bid to curtail load is submitted by the CSP using a proxy generator at the CLAP and the LSE schedules their load at the Default LAP. The LSE's Day-Ahead schedule is adjusted based on the quantity of the cleared Day-Ahead bid to curtail submitted by the CSP. Therefore, the LSE is getting paid implicitly the Day-Ahead price for that curtailed load that cleared the Day-Ahead Market. Bids to curtail load that clear the Real-Time Market are settled as uninstructed Deviation with the LSE. The CSP receives no direct settlement from the ISO under PDR option 1 and there is no baseline methodology employed by the ISO to determine performance of the curtailed load.

2. PDR Option 2

PDR Option 2 has the same characteristics as Option 1 with the exception that there is no adjustment made to the LSE's Day-Ahead Schedule for the cleared Day-Ahead bid to curtail load submitted by the CSP. Therefore all curtailed load is settled as uninstructed deviation with the LSE. This option was added to eliminate the need to establish a link between the CSP and LSE in the ISO's settlement system so that the ISO could adjust the LSE's Day-Ahead schedule by the CSP's cleared Day-Ahead PDR bid. Again, under this option, the CSP receives no settlement from the ISO and there is no baseline methodology employed by the ISO to determine performance of the curtailed load.

3. PDR A

Similar to the other two proposals, under the PDR A proposal all PDR bids to curtail load are submitted by the CSP at the CLAP and the LSE schedules their load at the Default LAP. The

key differences with the PDR A proposal as compared to the other two options are that all settlement for curtailed load is directly with the CSP rather than with the LSE and performance of the curtailed load is determined through a baseline calculation. The LSE's Day-Ahead schedule is adjusted for both Day-Ahead and/or Real-Time curtailed load based on the performance of the CSP's curtailed load as measured by the baseline.

Table 1 below illustrates a simple example of the three PDR options. The example assumes a single LSE to a single CSP and perfect compliance by the PDR resource. Additional examples that illustrate the three PDR options discussed are posted on the ISO website at:

http://www.caiso.com/2360/23608821fc90.xls

The assumptions for this example are as follows:

- LSE schedules 10 MW of Load in the Day-Ahead Market
- CSP clears 1 MW of load reduction in Day-Ahead and another 1 MW of load reduction in Real-Time
- Perfect compliance by PDR resource

Table 1 – Example of Basic Scenario for Three PDR Options

	PDR 1	PDR 2	PDR A
LSE Day-Ahead Demand Schedule			
LSE Cleared Day-Ahead Schedule	10	10	10
Adjustment	-1		
Adjusted Schedule for Day-Ahead Energy	9	10	10
CSP's Operation in Day-Ahead Market			
CSP's Cleared Demand Bid Day-Ahead	-1	-1	-1
Settlement to CSP			-1
CSP's Operation in Real-Time Market			
Cleared demand reduction Real-Time	-1	-1	-1
Settlement to CSP			-1
LSE Final Metered			

Demand			
Meter Read	8	8	8
Settlement to LSE			
Uninstructed Deviation	-1	-2	See Below
Calculation of UIE for PDR A			
LSE's Original Day-Ahead Schedule			10
Actual PDR (Baseline – Meter Reads)			-2
LSE Adjusted Day-Ahead Schedule			8
Actual Meter Read			8
Uninstructed Deviation			0

3.1. Pros and Cons of Three PDR Options

Table 2 summarizes the Pros and Cons identified by the working group for each of the three PDR design options[5].

	PDR 1	PDR 2	PDR A
Positives	▪ LSE paid Day-Ahead price for Day-Ahead DR ▪ No baseline resulting in simple implementation for ISO ▪ Settlement flexibility between CSP and LSE ▪ PDR impacts the LMPs	▪ Easiest for the ISO to implement due to no baseline and no settlement impact ▪ No linkage needed between CSP and LSE for purpose of settlements ▪ Settlement flexibility between CSP and LSE	▪ DR dispatched at CLAP and paid CLAP price ▪ Day-Ahead DR dispatch receives Day-Ahead price ▪ Motivates DR to high priced CLAPs ▪ Measurable and reportable performance of DR due to baseline ▪ DR benefits accrue to CSP

[5] This is a summary of the Positives and Negatives and not a complete list of what was compiled in the working group meetings

			rather than LSE
Negatives	▪ CSP has no obligation to perform ▪ CSP benefits accrue to benefit of LSE ▪ Need to allocate PDR specifically to each LSE to allow for adjustment of LSE DAM Schedule ▪ Motivates DR to low price CLAPs ▪ Dispatch price (CLAP) and settlement price (DLAP) at different location .	▪ CSP has no obligation to perform ▪ CSP benefits accrue to benefit of LSE ▪ Motivates DR to low priced CLAPs ▪ Day-Ahead DR settled at Real-Time price ▪ DR is not measurable and can get lost in Uninstructed Deviation	▪ Linkage between LSE and CSP needed for settlement same as PDR 1 ▪ ISO managed baseline adds complexity to implementation and policy ▪ Gaming concerns per LECG Money Machine (Load at DLAP and PDR @ CLAP) ▪ Meter data required at customer level for ISO settlement

One of the key issues that came out of the January 15th ISO stakeholder meeting was that the ISO needed to quickly narrow down the PDR options. In order to meet this objective, the ISO worked with the existing stakeholder working group that originally developed the PDR A proposal to help refine and develop a consensus PDR proposal. The working group created examples for all three PDR options, determined pros and cons of each, discussed gaming concerns and settlements impacts. There were some differences in opinion among the working group regarding what the best option for PDR but ultimately, the ISO and the stakeholder working group came to the consensus that PDR A is the proposal that is the closest to what FERC Order 719 intends.

PDR A is the option that was selected and is referred to as PDR throughout this document.

3.2. PDR Functionality

PDR-based demand response is the combination of load that is scheduled by the LSE using the Default LAP (DLAP) and a portion of that same load that is bid to be curtailed by the CSP at the Custom LAP (CLAP) using a proxy generator resource.

Demand Response participating as PDR may participate in the Day-Ahead Market (DAM) including RUC, the hourly or 5-minute Real-Time Energy Market (RTM) and the Day-Ahead and or Real-Time

Spinning Reserve[6] and Non-Spinning Reserve Market at a CLAP. The configuration of a CLAP may be as small as a PNode, or as large as an ISO defined Sub-LAP[7]..

The ISO recognizes that management of the data required for scheduling CLAPs may be difficult for DR resources that aggregate numerous small end-use customers, with frequent migration, i.e. enrollments and de-enrollments in a DR program. Therefore, the ISO proposes to provide market participants the option to designate their DR resources as located in ISO defined Sub-LAPs rather than to define a CLAP. In this case the ISO will use standard distribution factors that are derived from the EMS State Estimator and are stored in the Load Distribution Factor (LDF) library. The LDF library produces historical average LDFs based on a similar-day methodology. A number of market participants expressed concern about this approach in their comments submitted on March 20th and the ISO will discuss these concerns with stakeholders on the April 22 conference call.

PDR Bids to curtail load will be submitted to the ISO as if the PDR were a generator, using all of the same characteristics and attributes set by the ISO for a generator's market participation.

In accordance with requirements defined in FERC Order 719, the LSE and the CSP may be the same entity or different entities and a bid to curtail submitted by a CSP may include load served by multiple LSEs.

The settlement for the curtailed portion of the load would be settled by the ISO directly with the CSP at the PDR's specified CLAP, based on the LMPs of the PNodes that make up that PDR's CLAP. Any other settlements between the CSP and the LSE would be performed bi-laterally between the LSE and CSP outside of the ISO's settlement process. Determination of actual PDR delivery would be derived from measurement of aggregate meter usage, calculated from a pre-determined baseline.[8] Verified performance against the baseline would determine the energy settlement with the CSP at the CLAP. The ISO proposes to determine performance versus baseline on an aggregate basis rather than by calculating each end-use customer's baseline versus actual and summing the results. This topic will require more discussion with stakeholders through the Direct Participation Stakeholder process where the baseline methodology will be determined.

In accordance with this process, bids to curtail load that clear the Day-Ahead and/or Real-Time Market will appear as a reduction to the LSE's Day-Ahead Load Schedule for the purpose of settlement of uninstructed deviation. This is the only adjustment affecting LSE operations and its settlements processes with the ISO. Outside of the ISO's settlement processes there may be meter-to-cash impacts between the LSE and the retail participant due to DR resource participation in the wholesale markets. Otherwise, the LSE's Load is unaffected by the participation of DR resources in the ISO markets.

Some market participants support the ISO formalizing an explicit settlement between the LSE and the CSP to compensate the LSE for the energy that it procured/scheduled which was then curtailed by the CSP. This would involve the ISO creating a hybrid settlement approach where, rather than settling only with the CSP, the ISO would settle with both the CSP and the LSE based on an agreed to price and/or method. These market participants believe that having a formalized settlement may provide better financial "clarity" in the market and encourage more participation by CSPs. One option the ISO illustrated for discussion was the ISO paying the LSE the Day-Ahead DLAP price for

[6] Spinning reserve may have technical requirements beyond those required for non-spinning reserve. The outcome of these issues depends largely on seeking WECC interpretation of the technical requirements for these services. Because actual participation in ISO markets appears likely to occur for energy storage systems before PL resources, and because the technical specifications for these services appears to be the same (i.e., requirements for non-generation resources regardless of technology), the development of these technical specifications will occur in a parallel stakeholder process for energy storage systems.

[7] A Sub-LAP is defined as a CAISO set of defined PNodes within a Default LAP

[8] This established baseline will be developed in discussions with market participants through the ISO stakeholder process

cleared Day-Ahead PDR bids submitted by the CSP. This settlement, in effect, makes the LSE whole for energy purchased in the Day-Ahead market to support the load. The CSP would then be paid the difference between the DLAP price and the CLAP price for the demand reduction. However, a criticism of this approach is the Day-ahead price may not be representative of the actual price paid by the LSE for the energy; thus, other compensatory arrangements may still be needed outside of the ISO settlement process.

Other market participants support the settlements as proposed, only between the ISO and the CSP. These market participants believe that it would be very difficult for the ISO to determine an appropriate price to settle between the LSE and CSP and it is better to be left outside of the ISO's process and resolved through bi-lateral agreements. If the ISO determines and inaccurate price there would still be the need for bi-lateral agreements to resolve the discrepancies.

Market participants agreed that the ISO could move forward with the settlements as proposed for the conceptual proposal and that any variations to this settlement could be further discussed in the continuing stakeholder process where the detailed business requirements and processes for direct participation will be determined.

3.3. Illustrative Examples of PDR

Consider a specific Sub-LAP where there are two Local Capacity Areas. This is illustrated in the diagram below.

Diagram 1: Baseline Characteristics of a Network Environment

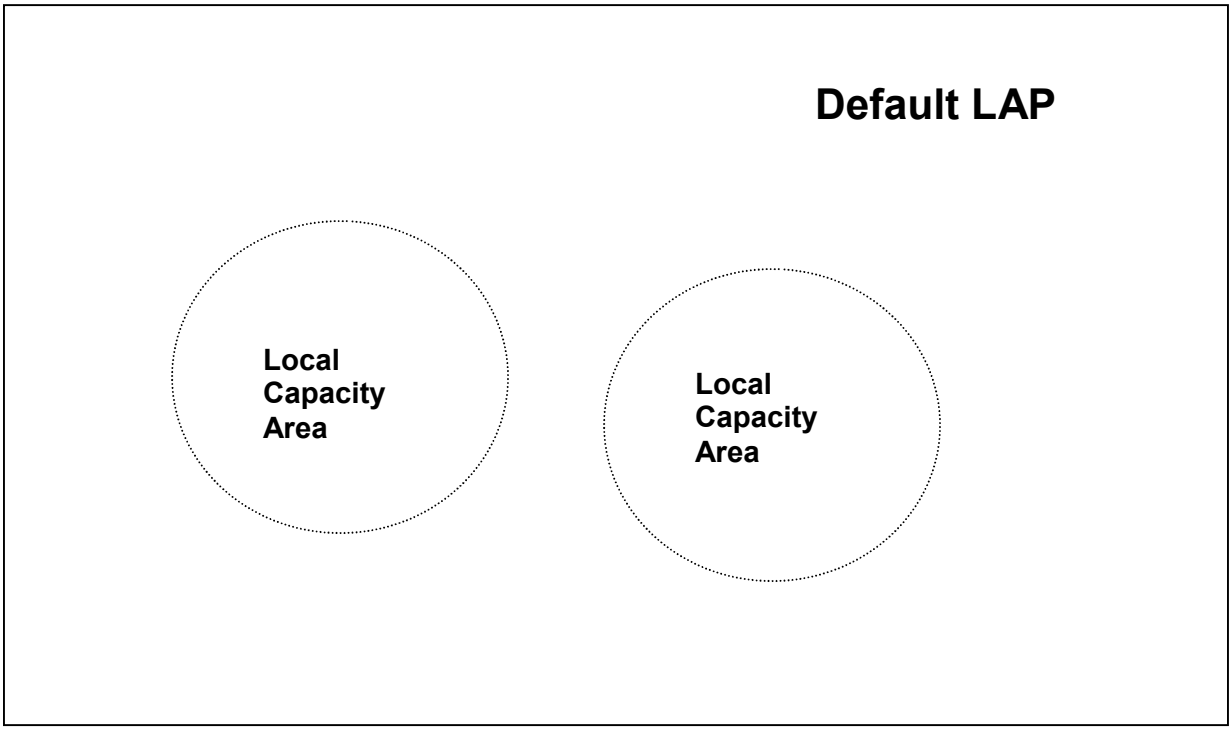
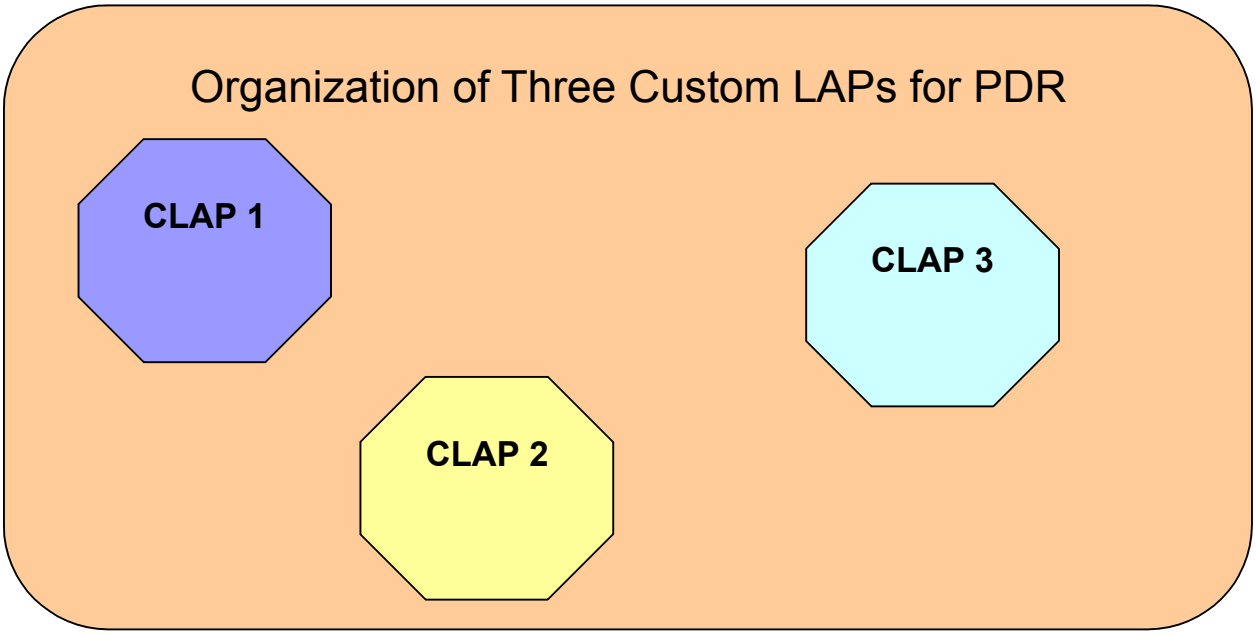


Diagram 1 shows a simple network environment composed of two local capacity areas. To meet reliability requirements and/or congestion constraints DR resources will be organized into CLAPs.

3.3.1. Energy and Cash Flow Between Affected Parties

Diagram 2: Organization of Three PDRs at Custom LAPS (CLAPs)

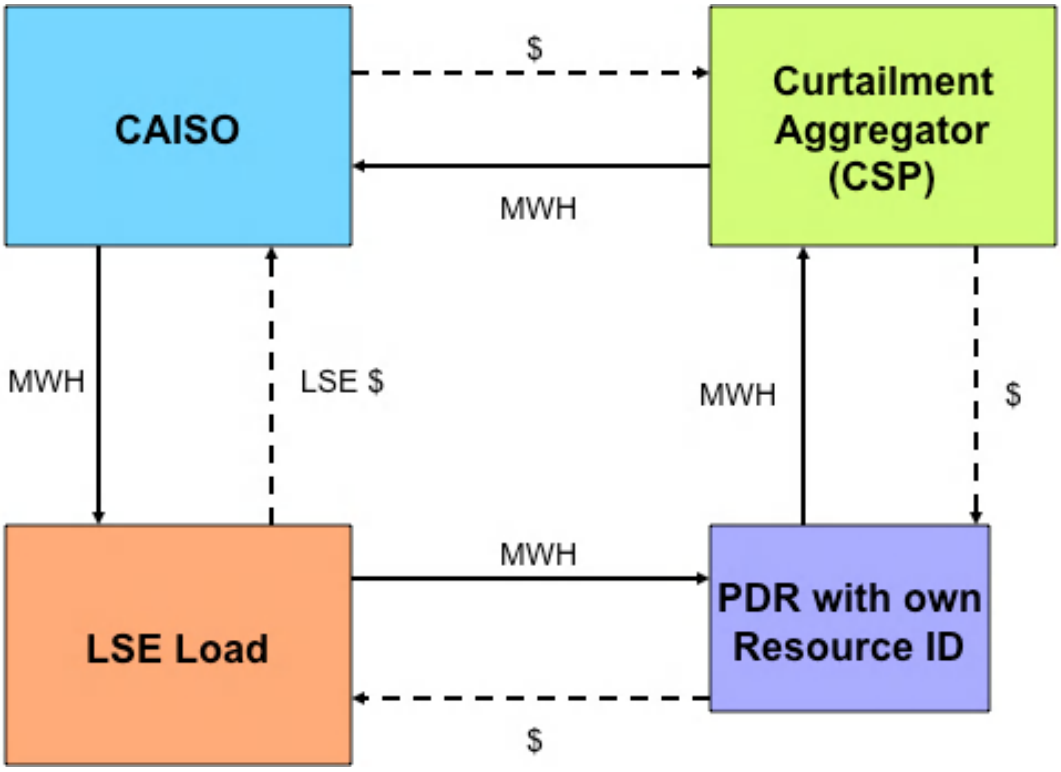


One or more CSPs proceed to organize PDRs in CLAPs to deliver DR resources to meet network reliability and/or congestion mitigation requirements. These CLAP based PDRs may be bid into ISO's Day-Ahead Market and or Real-Time Market.

- The PDR is bid into the ISO markets using its own specific Resource ID and is the source of the demand curtailment.
- The ISO pays money to the responsible CSP(s) and receives in return Megawatt quantities from demand curtailments.
- The ISO delivers Megawatt quantities from demand curtailments as it would from other supply side resources.

Diagram 3 below visually depicts energy and money flows.

Diagram 3: Energy and Cash Flow Between Affected Parties



Retail Load is split at the bottom carving out the PDR with its own specific Resource ID. Since all financial settlement is between the ISO and the CSP there may be bilateral agreements outside of the ISO between the CSP, End-Use Customer, and LSE to ensure that compensation is appropriately shared.

3.3.2. Bidding PDR into ISO Markets at the CLAP

To illustrate bidding PDR into ISO Markets at the CLAP, Diagram 4 depicts the curtailment capability of a hypothetical LSE where the DR contributions are aligned with LSE customer accounts identified as the sources of the DR resource for a specific PDR with its own specific Resource ID.

In Diagram 4 below, there are three sources of curtailment capability – LSE A , which can deliver 10MW out of a 100MW load, LSE -B, which can deliver 10 MWs and LSE C which can deliver 30 MWs.

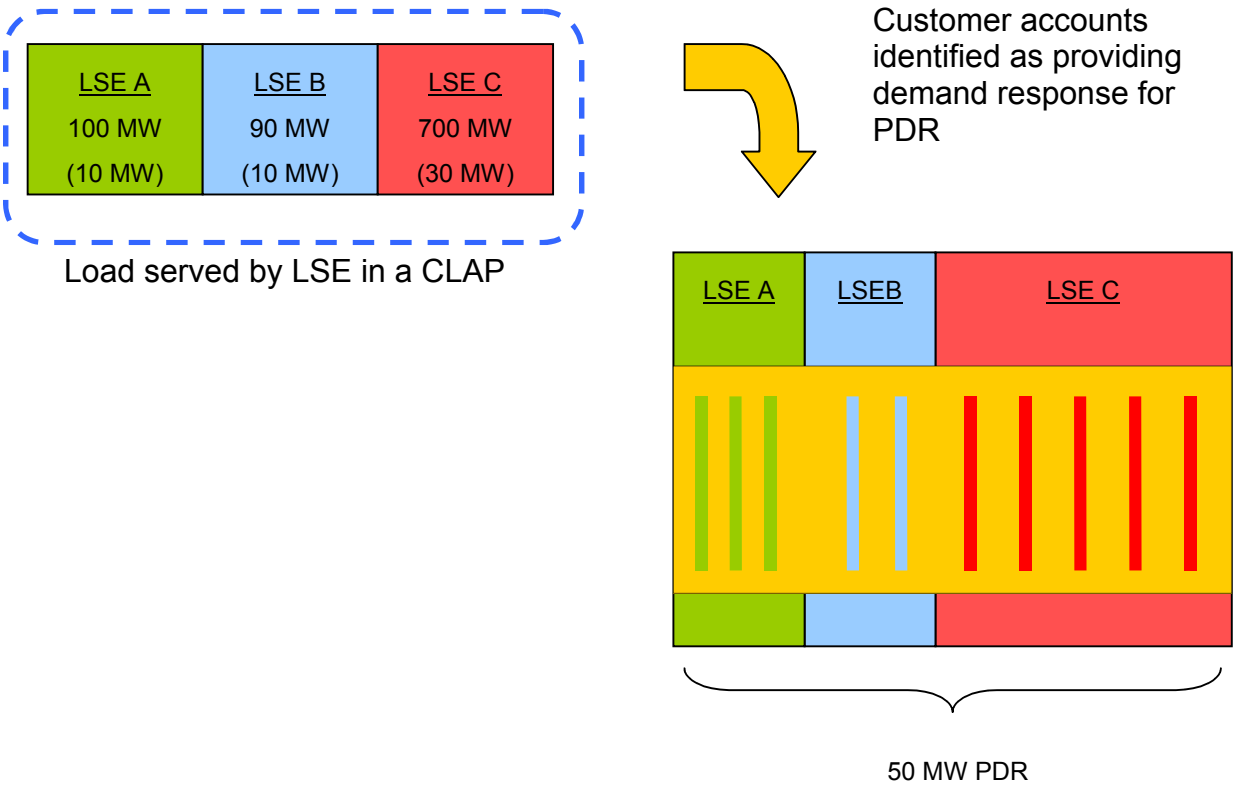
It is important to remember that under the PDR model, where DR resources are uncoupled from the base Load, it is possible for a PDR with its own specific Resource ID to consist of curtailable demand from customers that belong to more than one LSE.

Assume for illustration purposes that Diagram 4 curtailment sources do belong to multiple LSEs. The reason for using this assumption will be explained in discussion of Diagram 7 below.

These three sources align with specific customer accounts. The visual depiction shows the curtailment source and the lines under each curtailment source are abstract symbols representing the actual customer accounts.

When these curtailment sources are combined, they create a 50 MW PDR that can be bid into ISO's markets.

Diagram 4: Sourcing Curtailment from LSE Customer



3.3.3. Single versus Multiple DR Programs and PDR

PDR can be bid into ISO's markets as a single DR program or as multiple DR programs. The distinction between single and multiple DR programs rests in how individual LSE customer curtailment capabilities are bundled and mapped into specific CLAPs.

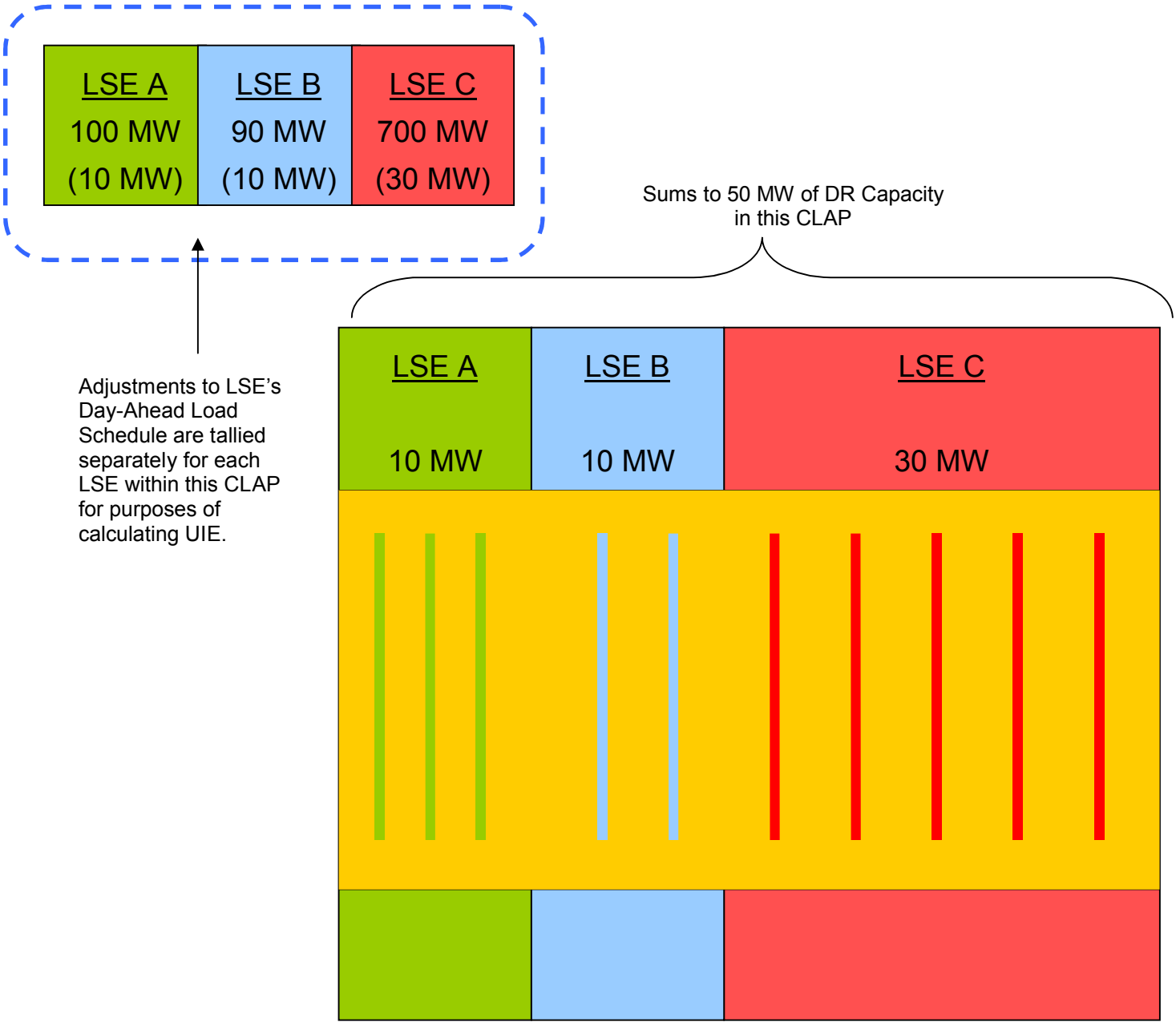
Each PDR bid could contain one or more DR programs that are located in a single CLAP. A bid may not contain DR programs that are located across multiple CLAPs.

3.3.4. PDR Settlements

Returning to the curtailment sourcing case depicted in Diagram 4, consider the settlement of the PDR derived from the three curtailment sources – LSE-A, LSE B, and LSE C.

The PDR settlements flow from and to the CSP, to the right, for the energy and cash flows, as depicted in Diagram 3. Since, in the PDR Model the DR and the Load are unbundled, there is a Day-Ahead Schedule adjustment for the purpose of calculating Uninstructed Deviation (UIE) that is made separately for each LSE within the PDR, i.e. each LSE, LSE-A, LSE-B, and LSE C, will have an adjustment to their Day-Ahead schedule taking into account their Load's participation in the DR. This adjustment is necessary to accommodate curtailment sources that consist of customers that belong to multiple LSEs. The adjustment is made solely for the purpose of calculating UIE. The LSE will still pay the Day-Ahead price to procure energy for load that is scheduled in the ISO's Day-Ahead Market. This is visually depicted in Diagram 5 below.

Diagram 5: Depiction of PDR Settlement Involving Multiple LSEs



Now, with this foundation in place, consider a specific example of a Capacity Bidding Program (CBP) at the retail service level, which serves a PDR bid into ISO's wholesale markets.

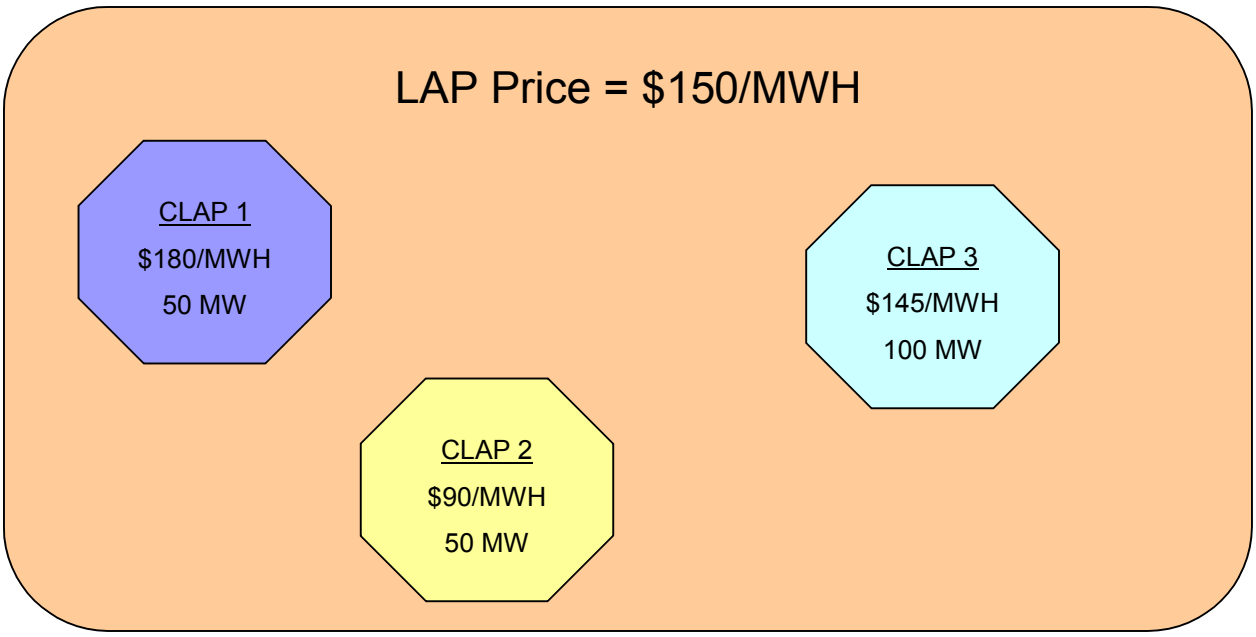
The CBP has the following characteristics:

- Monday-Friday (HE 12 – HE19)
- Three firm energy products: (1) 1-4 hour, (2) 2-6 hour, and (3) 4-8 hour
- 15,000 equivalent heat rate
- Maximum dispatch: 24 hours per month

The retail program is a 200 MW demand response program that translates into DR resources composed of a 50 MW PDR in one CLAP, labeled in Diagram 6 as CLAP 1; a 50 MW PDR in CLAP2, and 100 MW PDR in CLAP3. In the Diagram 6 case, the PDR bid prices are set at $150/MWH (using a natural gas price of $10/MMBtu). Since in this case there are DR programs located in three different CLAPs, three separate bids would be submitted with three individual Resource IDs.

Diagram 6 below shows the CLAP prices that reflect the market prices that settled in ISO's Day-Ahead Market. In other words, in Diagram 6, you see two numbers shown within each CLAP. The top CLAP number is a $/MWH value that reflects the CLAP market price, and the bottom number is the MW quantity making up the PDR, as described in the preceding paragraph.

Diagram 6: Value of Specific CLAPs when Called by ISO and Cleared in ISO's Day-Ahead Market



Continuing with the example case, consider the value differences shown between the CLAP market prices and the PDR bid prices at $150/MWH. In addition, this case also indicates that the DLAP market price is also $150/MWH.

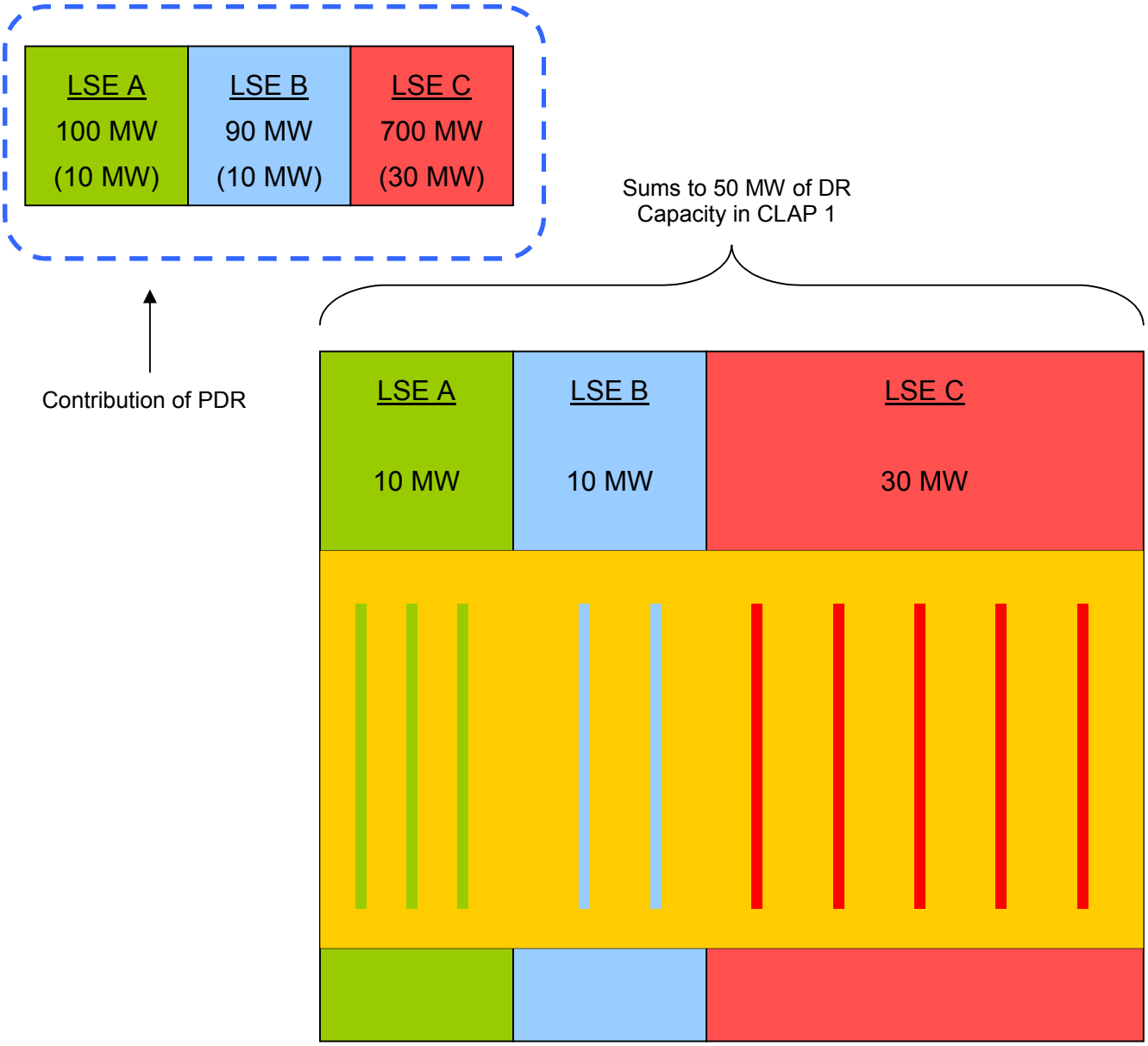
- PDR in CLAP 1 – is the only PDR that is dispatched since the market clearing price exceeds the bid price by $30/MWH (180/MWH – 150/MWH = $30/MWH gain).

- PDR in CLAP 2 – is not dispatched since the market clearing price fails to meet the $150/MWH PDR bid price by $60/MWH.
- PDR in CLAP3 – is not dispatched since the market clearing price fails to meet the $150/MWH PDR bid price $5/MWH.

Given these outcomes, DR resources are developed in CLAP1 because the gain is superior to outcomes for CLAP2 and CLAP3. In principle, the higher priced CLAPs will draw DR resource development. The development of additional resources (DR or generic supply) in high priced CLAPs will lower market prices and cause convergence between CLAP and DLAP market prices.

Diagram 7 below visually depicts the settlement

Diagram 7: 50 MW Award for PDR in CLAP



Value derived from the settlement is allocated back to the CSP consistent with the performance of each specific PDR. Table 2 below describes a settlement example where a bid to curtail submitted by a CSP involves the load of multiple LSEs. The example is based on Figure 9 above. The assumptions for this example are as follows:

- Three LSEs schedule 890 MW of Load in the Day-Ahead Market
- CSP clears 50 MW of load reduction in the Day-Ahead Market that is comprised of load from each of the three LSEs.
- Perfect compliance by PDR resource

Table 2 Settlement Example Involving Multiple LSEs in ISO Day-Ahead Market

	LSE A	LSE B	LSE C	Comment
LSE's DA Demand Schedule				
Cleared DA Schedule	100	90	700	
CSP's operation in DA Market				
Cleared Demand Reduction	10	10	30	
Settlement to CSP	-10	-10	-30	**Credit to CSP for DA DR award.**
CSP's operation in RT Market				
Cleared Demand Reduction	0	0	0	
Settlement to CSP	0	0	0	
LSE's Final Metered Demand				
Meter Read	90	80	670	
Settlement to LSE				
"Uninstructed" Deviation	See below			
Calculation of "Uninstructed" Deviation :				
LSE's Original DA Schedule	100	90	700	
"Actual PDR" (baseline - meter reads)	-10	-10	-30	**CSP informs ISO regarding allocation of MW between LSEs.**
LSE's Adjusted DA Schedule	90	80	670	
Actual Meter Read	90	80	670	
"Uninstructed" Deviation	0	0	0	

4. Development of Baseline for PDR

The conceptual design of PDR includes the need for a baseline calculation to determine the quantity of load curtailed in order to settle with the CSP. A baseline is defined as an estimate of what a customer's load would have been during the DR event without taking any DR actions, for the purpose of determining the customer's load reduction.

The specifics of the baseline calculation will be determined through further discussions with stakeholders in meetings that will be held in April through August 2009. The CPUC is currently engaged in a proceeding to provide guidelines for baseline methodologies for DR retail programs. The CPUC decision is planned for May 2009. The ISO may use the CPUC baseline methodologies as a starting point for analysis and further discussion with stakeholders.

5. LECG Gaming Concerns and PDR Model

The PDR proposal involves scheduling, dispatch and settlement of the curtailed load or PDR at the CLAP and the scheduling of the LSE base load at the Default LAP. LECG identified gaming concerns in the case when DR dispatches are not settled at the same location as the underlying demand schedules which are explained in "Comments on the California ISO MRTU LMP Market Design", which is Attachment C to the ISO's May 13, 2005 amendments to its MRTU comprehensive design as filed with FERC, which are available at

http://www.caiso.com/docs/2005/05/13/2005051314175518804.pdf).

The gaming opportunity for demand response that LECG identified (p. 62 in the LECG comments) is described as follows:

> "The sixth of the major implementation issues identified with the MRTU market design is the proposed mechanism for demand response. Since demand response buys power at the zonal/LAP price in the DAM and sells power back at the nodal price, demand response at nodes within constrained regions have a money machine whenever their actual load is less than their allowed maximum demand response offer. The LSE providing demand response would merely buy power equal to its demonstrated dispatch capability at the LAP price in the DAM and bid demand response at a low enough price to ensure it is dispatched nodally down to its planned consumption in RT, earning the difference between the nodal price and the zonal price for doing nothing. This would be equivalent to the effect of virtual demand purchases at zonal prices in the DAM that are settled at nodal pricing in real- time.
>
> "A load's demonstrated dispatch capability is presumably limited by its maximum energy consumption but it may be economic to inflate this if the spread between the LAP and nodal price is material over a large number of hours. The implicit subsidy in buying at the LAP and selling at the nodal price could become expensive to other consumers. This cost could be exacerbated by some of the other market design features, such as the way LAP bids are cleared in the DAM, which would tend to magnify the difference between the DAM LAP price and the RT nodal price.
>
> "Conversely, demand response resources would have little incentive to reduce load at times when congestion is low but prices high. Indeed, demand response loads in unconstrained portions of the transmission system might rarely have an incentive to provide demand response, as the RT nodal price would need to rise above the LAP price before it would be profitable for them to respond. If there is material congestion within the LAP, the RT LAP price could be higher than the nodal price for these loads, diminishing their incentive to participate in such programs."

The ISO believes that potential gaming opportunities for PDR are very limited for the following reasons:

- LECG's gaming concerns involve DR participation that occurs in a significant number of hours but DR programs that aggregate numerous customers, which is what PDR was developed to accommodate, have limits on hours of use and are more likely to involve infrequent operations.
- The DR resources that PDR is designed to accommodate will tend to be high priced resources which limits the probability of guaranteed dispatch which is a key element of LECGs gaming concern
- Gaming concerns involving strategic moves by customers to manipulate the outcome of the baseline calculation appear to be less likely when customers are part of larger aggregations, assuming the baseline is applied to the aggregate load.

In order to further mitigate possible gaming concerns and to ensure that DR resources using the PDR model have the characteristics that PDR is designed to accommodate, as an initial starting point, the ISO proposes a limit for proxy demand resources of operation of 200 hours per year and a minimum bid price set to the Default LAP price that was exceeded for only 200 hours in the previous year. These limits will be re-evaluated after summer 2010 based on experience with the PDR product.

6. Impact of Direct Participation Requirements on PDR

The ISO identified the following seven categories as a framework to identify and resolve business issues and processes related to the Direct Participation directive in Order 719. The ISO shared this framework with stakeholders at the January 15 stakeholder meeting. The ISO's initial position on each of the categories is summarized below and is described in more detail in the Straw Proposal for Direct Participation and PDR. The business processes needed to address each of the seven areas will be discussed and developed with stakeholders through a series of stakeholder and working group meetings in April – August of 2009.

1. Qualification (program definition, participant and resource qualification)

- The ISO does not find it necessary to either broaden its role beyond that of market operator, or to change either the existing requirements for market resources to be represented by Scheduling Coordinators. The ISO does not see needs for extensive revisions to the tariff provisions governing Scheduling Coordinators.
- When seeking to qualify a DR resource, the CSP must certify to the ISO that participation by its resource is not precluded by the Local Regulatory Authority, e.g., the CPUC. The eligibility of the DR resources themselves does not seem to be affected by whether they are operated by a CSP that is the same entity as the LSE, or by an independent CSP through Direct Participation.
- It is the CSP's role, not the ISO's, to create demand resource aggregations.
- The ISO's market recognizes market resources' operational constraints as part of bid submissions using PDR, but the ISO does not determine the resources' operational constraints.

- The utilities' retail programs include emergency response programs such as interruptible tariffs, but the ISO's markets do not have emergency response products. The ISO tariff already limits the participation of the same end-use customers in emergency response programs and PL resources, and the ISO does not see the addition of CSPs to the market as changing the existing tariff provisions.[9]
- The ISO does not currently operate and is not currently developing a market for resource adequacy capacity, and instead works with Local Regulatory Agencies (such as the CPUC) to develop RA requirements that market participants must meet. The LRAs define which resources qualify as RA capacity.

2. Registration (resource characteristics, enrollment, transfers, testing & auditing)

The following principles appear to be appropriate requirements for Direct Participation:

- A PDR is served by one CSP and may consist of multiple end use customers from one or more LSEs
- An end use customer that is participating as a PDR can be registered to one CSP and one LSE at a time on any given trading day.
- The end use customer that is participating as a PDR is registered to the correct CSP / LSE
- All registered end use customers that comprise a PDR are aware that they are registered with a specific CSP / LSE
- Confirmation of any change of CSP / LSE is communicated to the end use customer that is participating as a PDR and the end use customer that is participating as a PDR affirmatively confirms that change
- An end use customer that is participating as a PDR who wishes to leave the PDR resource pool confirms that it has been removed
- The CSP / LSE's report to the ISO of DR capability is accurate and reflects the registered PDR capacities.

- The ISO's existing processes for registering PDRare documented in the MRTU Release 1 Participating Load User Guide, and provide a flexible structure for managing PDR, and for providing the ISO with the information it needs to manage its markets without excessive needs for the ISO to track individual end-use customers.
- Each CSP is responsible for managing its PDRs and will see the financial impacts of any mismanagement in its final settlements. There appears to be no need for the ISO to develop complex systems for tracking individual end-use customers to actively manage the registration and confirmation process. Instead, market participants should be responsible for managing end-use customer registrations, pursuant to rules and processes that the ISO and CPUC will establish.
- LSEs as well as CSPs need to be aware of PDR enrollments and schedule changes. The ISO's tariff will establish the principles for this data exchange, followed by development of implementation details in the Business Practice Manuals and Participating Load Users Guide.

[9] See section 7.7.11.2 of the CAISO Tariff

In actual operations, the CSP's enrollment of PDR will require the CSP to identify the LSE to the ISO, so that the LSE can be notified of the PDR schedule changes.

3. Scheduling (system and resource forecasting, resource scheduling & bidding)

- Except for the presence of both the LSE and CSP as market participants, the basic functions of scheduling are not changed by the addition of the CSP as a market participant that is separate from the LSE.
- When the LSE and CSP are separate entities, scheduling functions that would be performed to schedule demand that if it were not participating in DR would remain with the LSE, but functions that exist because of participation in a DR program would be the CSP's responsibility.

4. Notifications (market schedules & awards, RT dispatch, outages)

- Other than new needs to communicate MW quantities of demand schedules and dispatches to both the CSP and LSE, the ISO has identified no need to change the existing notification mechanisms for communicating schedules in the DA market and dispatches in the RT market, and will continue to use the existing mechanisms as documented in the User Guide.
- LSEs as well as CSPs need to be aware of DR enrollments and schedule changes.
- There will need to be a process for the CSP to inform the ISO how to allocate the PDR MWs that are part of a PDR bid between LSE's in the PDR model.

5. Metering and Telemetry (data availability, data exchange, data type & granularity)

- The ISO has already established requirements for metering and telemetry, which are documented in the MRTU Release 1 Participating Load User Guide and will continue to apply after Release 1. Interval metering is required for settlement of interval energy usage, but telemetry is required only for providers of ancillary services. If a DR resource participates only in hourly energy markets, only hourly interval metering is required.
- Although there are alternatives for the ISO's direct settlement of the energy resulting from DR directly with the LSE and CSP, bilateral arrangements between the CSP and LSE are an alternative for reallocation of the energy settlements between these entities. Regardless of the mechanism for energy settlement, the ISO's settlements for ancillary service and RUC capacity products are anticipated to be to the CSP. Settlement of ancillary service and RUC capacity relies on a "baseline" calculation that estimates of energy usage in the absence of the dispatched DR, which has some amount of error. Because there inherently is error in the baseline calculation, the ISO anticipates allowing the CSP to provide either telemetry-based data or revenue quality meter-based data to support settlements of AS and RUC capacity.
- Ultimately, metering, meter data management, and telemetry issues will require significant stakeholder discussions, which will continue as implementation issues after policy issues concerning ISO markets are resolved.
- The ISO proposes that PL or PDR that connects to the ISO Controlled Grid without other loads being served from the same grid takeout point would be a ISO Metered Entity, and otherwise PL or PDR would be SC Metered Entities.

6. Settlement (calculation of load changes, calculation of credits & charges)

- Because "baseline" methodologies for calculating energy usage in the absence of the dispatched DR are used in allocating financial payments among the ISO's market participants, but will take considerable time to develop and implement, the initial implementation of market enhancements needs to use a set of initial requirements for use of baseline calculations, and then examine potential refinements over time. Settling the energy for DR dispatches at different locations, with different LMPs, than the underlying schedules requires greater precision in the baseline calculation for determining the amount of response, compared to direct settlement of DR as simply a capacity resource. As the ISO and its market participants gain experience with baseline calculations, the ISO can re-examine its initial design of baseline calculations and financial settlements.
- Allocation of savings between market participants involves complex trade-offs among multiple alternatives. The ISO will continue to work with the CPUC and stakeholders to develop sufficiently mature baseline methodologies to support ISO settlements. Based on adoption of a standard methodology, after receiving input from Local Regulatory Authorities, the ISO would proceed with settlements that allocate the DR savings to the CSP or divide the savings between the CSP and LSE, for example by reimbursing the LSE for its DA schedule that is curtailed by the CSP, and crediting the CSP with the balance. The ISO anticipates directly settling AS and RUC capacity payments with the CSP. This does not mean that revenues received by the CSP are limited to the capacity payments, because the CSP and LSE may negotiate a sharing of the energy revenues that are initially paid by the ISO.

7. Performance & Compliance Evaluation (resource, participant, program, and system performance evaluation, compliance monitoring)

- Given the explicit UDP exemption to all loads that is already in the ISO tariff, and the FERC requirement to implement Convergence Bidding 12 months after MRTU Go-Live, the ISO does not see needs for additional non-compliance penalties for price-responsive energy dispatched from DR resources, beyond the existing provisions that apply to AS, RUC, and RA capacity resources. However, the ISO will enforce the existing provisions for DR resources just as it does for other market resources.

7. Next Steps

The ISO, along with the stakeholder Demand Response working group, came to the consensus that the PDR proposal described in this document was most closely aligned with FERC Order 719 direction on direct participation and provides the best market-based solution for integrating demand response resources and programs into the ISO's energy and ancillary services markets. The requirement for employing a baseline calculation to measure and verify performance of the PDR resource introduces complexity, but, at the same time, it enables the ISO to measure and report on the performance on Demand Response resources in its wholesale markets. In addition, the demand response resources participating under PDR are paid at the CLAP price rather than the DLAP price which the ISO and its stakeholders believe is the appropriate price signal to send to help develop demand response resources where they are needed most.

The ISO will seek Board approval on the conceptual design of PDR in May 2009 and plans to implement PDR by May 2010. A stakeholder process will continue after that time up to August 2009

to resolve and determine requirements for the seven key areas that are impacted by direct participation requirements as they relate to the design of PDR.

The ISO requests that Stakeholders submit written comments to mmiller@caiso.com by close of business April 29 in order for those comments to be considered in the ISO Board documents. The ISO will discuss and answer questions on this proposal on a stakeholder conference call scheduled for April 22.