



Demand Response Barriers Study

Introduction & Project Objectives

April 8, 2009

DECK WITH STAKEHOLDER COMMENTS

John Goodin

Lead, Demand Response

Regulatory & Policy Development

FERC Order 719

1. Accept bids from demand response resources in their markets for ancillary services comparable to any other A/S capable resources
2. Allow demand response units to specify limits on frequency, duration, and the amounts of their service in bids to provide ancillary services
3. Eliminate, during a system emergency, a charge to a buyer in the energy market for taking less electric energy in the real-time market than purchased in the day-ahead market
4. Requires ISOs to assess, through pilot projects, the technical feasibility and value to the market of using ancillary services from small demand response units
5. Permit a DR aggregator to bid demand response on behalf of retail customers directly into the organized energy market
6. **Study and report on whether further reforms are necessary to eliminate barriers to demand response in organized markets**

FERC Order 719 - Study Objectives

- Report on remaining barriers to comparable treatment of demand response resources
 - *ISOs have a duty to remove unreasonable barriers to treating demand response resources comparably with other resources*
- Propose solutions and a timeline for implementation
 - *Those issues that are practical to analyze by April 28th and communicate a time frame for analyzing the remainder*
- Identify any significant minority views
- The Market Monitor must submit a report describing its views on these issues to the Commission

CAISO Deliverables

1. Identify, analyze and prioritize barriers, incorporating possible solutions or needed reforms, where possible
2. Ensure minority views are represented and clearly identified
3. Coordinate a response from Market Monitoring/Market Surveillance Committee



Demand Response Barriers Study



California Background and DR Barriers

April 8, 2009

Dan Engel, FSC
Snuller Price and Eric Cutter, E3

Project Components Roadmap

1. DR Barriers Literature Review
2. Identify Stakeholders to interview
3. Develop interview guide with input from CAISO
4. Conduct interviews
5. Provide preliminary barrier assessment and gather stakeholder input via well announced Webinar
6. Stakeholder comment period
7. File Study in conjunction with April 28th FERC Filing

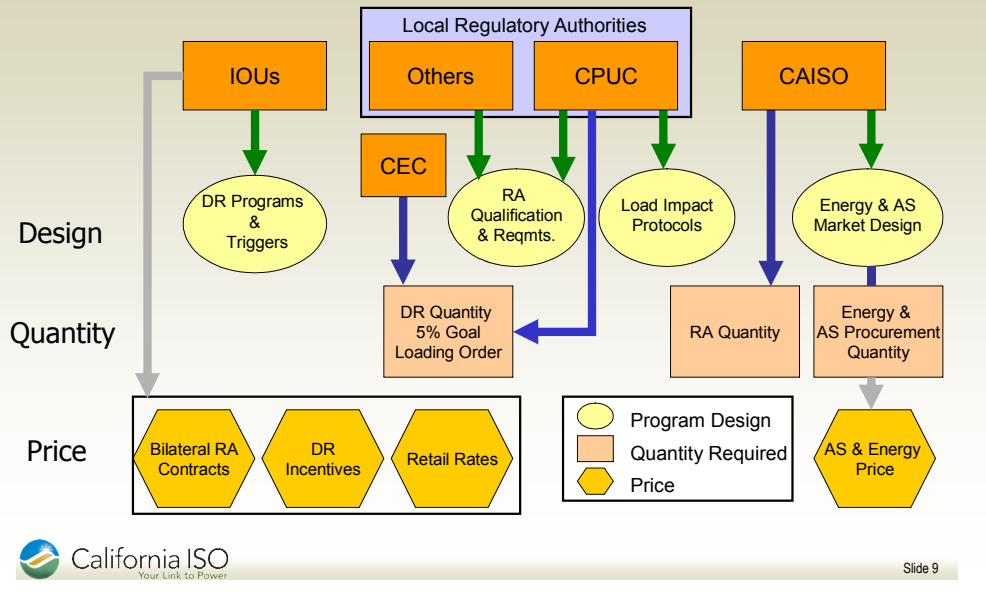
Project Schedule

- Feb 24 ⇒ Literature Search and Review
- Mar 24 – Apr 6: Interviews Conducted
- Apr 8: Stakeholder Webinar Conference Today
- Apr 17: Stakeholder Feedback Due to CAISO
- Apr 21: Final Draft Submitted to CAISO for Review and Comment
- Apr 23: CAISO Comments fed back for Incorporation into Final
- Apr 24: Final Report Due
- Apr 28: File DR Barriers Study with FERC
- May: Review by DMM and MSC
- June: File DMM/MSO Report/Opinion

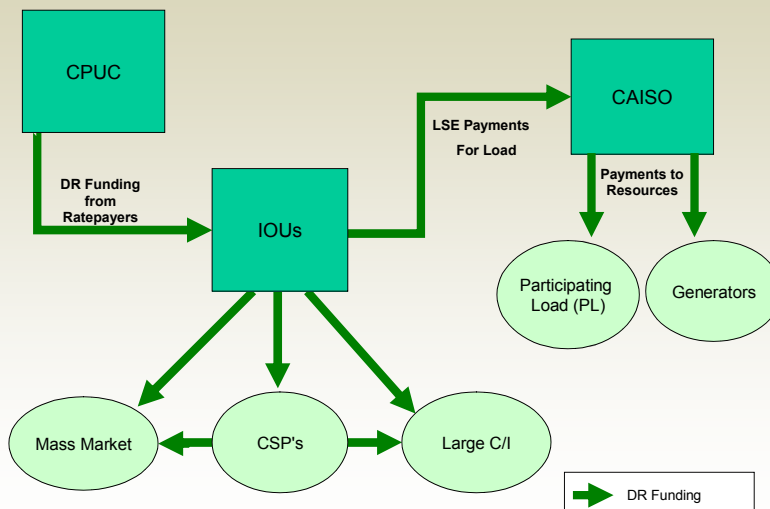
30-Year History of DR Programs in CA

- Long history in California of DR
 - Emergency-triggered DR Programs since PURPA
- Current status
 - Water agency pumps participate directly in the CA ISO markets as Participating Load
 - All other DR programs, price and reliability-based, are managed by utilities
 - Expected reduction of ~2,250 MW (CAISO 2008 Annual DR Report)
 - DR programs a mix of utility and 3rd party demand response aggregators

California Hybrid Market: DR Program Design, Quantity, and Value



Demand Response Funding Flow Chart



SCE Comment:

Slide 10: This graphic of the “funding” for demand response misses the “avoided cost” nature of demand response programs. While the IOU participation payments are “funded” from ratepayers, what is missing from this graphic is the reduction in resource adequacy costs incurred by IOUs as a result of procuring demand response. Also, the arrow labeled “LSE payments for load” should actually be “LSE reduced payments for energy” with the direction reversed.

Enrolled¹ MWs in Utility Demand Response Programs

	July 2003	July 2005	April 2008	5% DR Goal
Dynamic Pricing (CPP)	0 MWs	50 MWs	112 MWs	2,500 ² MWs
Incentive-Based DR Programs	0 MWs	800 MWs	1,024 MWs	
Emergency-triggered Programs	1,485 MWs	1,600 MWs	1,850 MWs	N/A

[1] "Upper-bound" estimates – represents highest potential load drop. Actual results may vary.

[2] 5% of an assumed 50,000 MWs of system peak demand – **illustration purposes only**

Information from CPUC – Bruce Kaneshiro presentation June 23, 2008

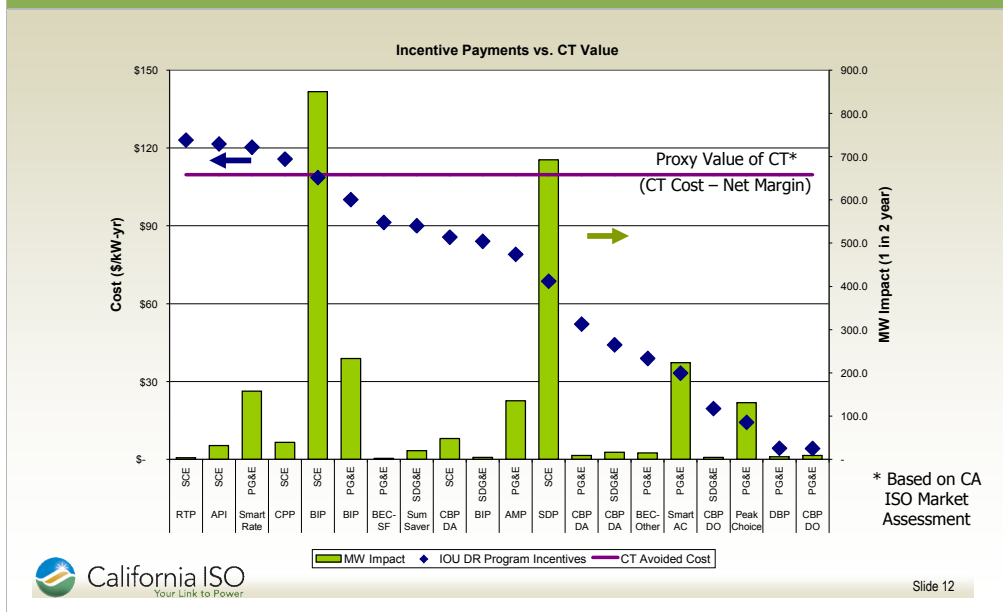


Slide 11

SCE Comment:

Slide 11: This chart is no longer accurate and should be updated, revised or eliminated. Regarding the quantification of 1,850 MW of "emergency-triggered programs", SCE believes that it has resolved the CAISO's concern with reliance on emergency-triggered programs by changing the trigger point of the BIP program to prior to when an emergency is declared. (A similar change to the SCE's other reliability programs (i.e. Agricultural Pumping and Air Conditioning Cycling, a.k.a. Summer Discount Plan, are pending approval.) There is a similar statement on Slide 19 that also requires correction. Also, the reference to a 5% goal as a price-responsive goal has been withdrawn by the CPUC pending reconsideration. In the proceeding considering Applications A.05-06-006, et al, Commissioner Chong issued a proposed decision explaining that revisions to the 5% price responsive goal were necessary. Subsequently, the Commission initiated rulemaking R.07-01-041 to address DR goals, cost effectiveness and other issues. DR goals are to be addressed in a pending decision under Phase II.

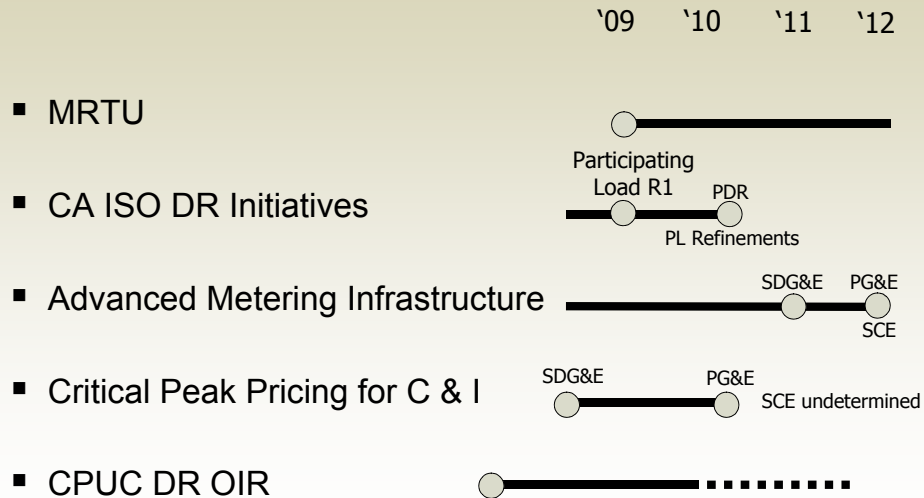
Proposed IOU Incentive Payments and Impact in 2009-2011 Program Plans



SCE Comment:

Slide 12: The graphic on the slide is misleading and provides no value. It also does not include SCE's entire proposed portfolio (e.g. DBP, CBP Day-of, and DR Contracts). Moreover, the incentives listed do not show any correlation to the MW impacts. In fact, RTP does not have incentives but rather increased prices due to weather conditions. Lastly, the slide does not prove whether or not a program is beneficial and should be adopted by the Commission.

Ongoing California DR Initiatives and Timelines



PG&E Comment:

Slide 13: We recommend that the CAISO add the IOU's 2009-2011 DR program applications as an item. The recently opened Smart Grid OIR is another item to consider for this chart.

SCE Comment:

Slide 13: This slide states that CPP for C&I is "undetermined" for SCE. However, SCE in Phase 2 of its 2009 GRC, has proposed for its medium commercial customers (20 to 200 kW) an optional CPP overlay for its GS-2 and GS-2-TOU customers and for its large commercial customers (>200kW), mandatory TOU rates with default TOU/ CPP on TOU-GS-3 (Option B) and on TOU-8. In addition, SCE recently filed comments pursuant to an Assigned Commissioner Ruling in A.08-03-002 stating that in Phase 2 of its 2012 GRC, it would propose for medium commercial customers, default TOU/ CPP and mandatory TOU for customers with advanced meters, with optional RTP based on post-MRTU experience.

Broad Cross-section of Stakeholders

- Investor Owned Utilities
- Publicly Owned Utilities
- California Public Utilities Commission
- Demand Response Providers
- Consumer Advocates
- Customer Representatives
- Electric Service Providers
- WECC / NERC
- FERC
- California Energy Commission
- California Air Resources Board
- Water Agencies
- California Legislature

Today's webinar, and follow-on feedback,
is designed to receive input from all participants

Scope Used to Define Study of California DR Barriers

- Focus on California market only
- Approximately five year time horizon
- Focus on “barriers” not “issues”
- Multiple perspectives



Structure of Barrier Feedback and Discussion

- Walk-through of the list of barriers by topic
 - Clarifying questions during walk-through
- Listen for the Following Areas
 - Accurate characterization?
 - Is something discussed an issue and not a barrier?
 - Is a barrier missing?
 - Can current initiatives address the barrier?
- Group Discussion with Remaining Time
- Comments Accepted until April 17 for Incorporation in the Study

Structure of Barrier Feedback and Discussion

Categories of Barriers

- Market
- Regulatory
- Customer Participation
- Infrastructure and Technology
- Operations and Settlements

Market Barriers

- **Customers accustomed to existing IOU programs**
 - Long history of DR programs in California since PURPA in the 1970s.
 - Shifting customers from well understood (both in terms of operations and compensation) IOU programs to competitive and generation based markets may result in reduced participation.
 - Customers accustomed to high capacity payments while utilities have in the past limited number of calls to retain customers.

SCE Comment:

Slides 18 and 19: These are not barriers to DR. Many of SCE's demand response programs have targeted customers willing to be interrupted during scarcity conditions in response for a fixed payment tied to the value of an avoided capacity purchase. SCE believes that the majority of such customers place significant value on the certainty of the participation payment they receive and have a relatively high "strike price" that is above CAISO bid caps. An attempt to shoehorn such customers into CAISO markets would risk having these customers drop out of SCE's demand response programs and require SCE to procure capacity from more expensive supply resources, in violation of Order 719's direction for equal treatment. SCE also has demand programs that have energy strike prices and have been coordinated with market prices. The CAISO needs to recognize that customers fit into different market niches and accommodate this diversity with a range of different approaches to demand response program integration. Labeling the preference for some customers to participate in capacity markets as a "barrier" simply because the CAISO does not have an organized capacity market is plainly wrong.

Market Barriers

- ***Existing programs poorly aligned with CAISO markets***
 - More frequent calls likely to lead customers to drop out.
 - No clear wholesale market parallel for emergency programs, aligning emergency type programs is akin to fitting square pegs in round holes.
 - Utilities emphasized emergency programs with high capacity payments to attract customers, but have more emergency DR than needed by ISO. But moving customers to 'earlier', more frequent or price based triggers may lead to drop out.
 - Utilities favor triggers that are predictable and transparent to customers, not necessarily aligned with CAISO needs.
 - Customers understand emergency program rationale and get behind participating due in part to "good corporate citizen" tag; price-responsiveness may not have that cache or appeal.



Slide 19

CPUC Comment:

Slide 19: The CPUC staff believes that the only barrier on this slide that is properly categorized as "poorly aligned with CAISO markets" is the issue of Emergency-Triggered DR (ETDR). ETDR programs are being addressed in the CPUC's DR Order instituting Rulemaking (R.07-01-041). The CPUC staff is aware of these arguments and will consider all parties input when making decisions on these matters.

The CPUC staff is aware that other retail DR programs (economic, price-responsive programs that are not emergency-triggered) may not align well with CAISO markets at this time. The CPUC is, however, working with CAISO and other stakeholders to remedy such problems where appropriate.

More frequent calls may, in fact, lead customers to drop out of DR programs, but this problem is not an alignment problem. This is a "Customer Participation" issue.

If Curtailment Service Providers (CSPs) are permitted to bid DR directly into the CAISO market, then the IOU preferences for "triggers that are predictable and transparent to customers" should not present a barrier. A preference for these types of triggers might mean that IOUs would not operate as a CSP, but it should not prevent a third party from bidding directly into CAISO markets. Again, this is not an alignment barrier between the CPUC programs and CAISO markets, but simply a matter of what the IOUs like versus what could happen with CSPs.

SCE Comment:

See Slide 18:

Market Barriers

- ***RA/Capacity market does not accommodate DR well***
 - Functioning RA/Capacity market will limit energy prices. Energy prices insufficient to encourage DR so capacity and AS payments will be of primary importance.
 - Lack of forward capacity market value stream viewed as a major impediment by many.
 - Need better accommodation of “use limited” resources to allow participation of different load types.
 - Capacity market rules should not be biased for or against particular resources (generation vs. non-generation) but be based on capability and performance.



Slide 20

CPUC Comment:

Slide 20: The first three arguments made on this slide are not specific to DR resources. These same statements can be made for traditional generating resources. For the fourth bullet point, the barrier is not clear. It seems to imply that capacity market rules that are based on capability and performance are somehow disadvantageous to DR. This issue should be better clarified.

PG&E Comment:

Slide 20: We disagree with the central point of this slide. In markets with functioning capacity markets, capacity revenues are the main form of wholesale market value for many types of DR.

Is the point of this slide that the volatile energy prices associated with energy-only approaches to resource adequacy might elicit larger curtailments from price responsive demand?

Are the first two sub-bullets inconsistent? Any resource adequacy/capacity market blunts the necessary energy price signals but the absence of a clear capacity price signal is also limiting the development of DR.

Virtually all existing DR programs now count towards resource adequacy requirements. What better accommodation of use limited resources is necessary in the existing resource adequacy rules?

SCE Comment:

Slide 20: SCE agrees that lack of a forward capacity market is a barrier to accommodating some forms of demand response into CAISO markets. Currently, SCE uses a combustion turbine proxy resource as the basis for pricing capacity value when procuring demand response resources. The availability of a forward capacity price provides a market price signal, and may also encourage ESPs or CSPs to participate directly in CAISO markets.

Market Barriers

- ***Disagreement over bilateral vs. centralized capacity market structure***
 - Some object to lack of transparency and high transaction costs of bilateral RA contracts.
 - Some feel bilateral contracts provide greater flexibility to accommodate different types of load and participants.
 - Impression based on experience in eastern markets that cost to ratepayers may increase with centralized capacity markets.

CPUC Comment:

Slide 21: This slide does not clearly explain the nature of the perceived barrier. The arguments for the two options for a capacity market are well known, but the CPUC staff would like additional explanation regarding how either a bilateral capacity market or a centralized market may pose barriers to direct bid-in demand.

PG&E Comment:

Slide 21: It is unclear how this slide pertains to DR. Perhaps this can be removed as a barrier to DR.

SCE Comment:

Slide 21: This is not a barrier, but rather a difference of opinion that should not be included in the CAISO's DR Barriers report to FERC.

Market Barriers

- **Regulation and spinning reserve AS markets revenues are essential to DR but precluded by WECC rules**
 - AS markets particularly important source of revenue if energy prices are limited by RA market.
 - Many customers that cannot commit to one year or four month program could participate in AS markets on ad hoc basis.
 - DR infrastructure investments need certainty of a long-term revenue stream.
 - Requirements should be based on system needs and capability, not on resource type.



Slide 22

CPUC Comment:

Slide 22: The CPUC staff agrees that AS markets may be an important revenue stream for DR resources. CPUC staff is concerned, however, that DR will face an additional barrier even if WECC allows DR to qualify for regulation and spinning reserves. Currently, because of WECC requirements, all CAISO AS products must respond within ten minutes. This short response time could prohibit DR resources from participating in CAISO's markets, as well as automatically disallowing residential customers who have hourly interval meters. This is a WECC imposed barrier and not necessarily a CAISO barrier. Therefore, CPUC staff believes that WECC should consider creating a thirty minute operating reserve product (similar to the product being used in Eastern Markets), which could increase the number of DR resources available to the CAISO. The CPUC staff understands the reliability concerns that WECC must balance when creating reliability standards, but CPUC staff believes that the existence of this product in Eastern Markets suggests that a thirty minute product may provide additional reliability resources.

CPower Comment:

Slide 22 – *Regulation and Spinning reserve Markets... precluded by WECC rules.* It is not clear to CPower why this is a barrier and not an issue. With the correct equipment and call ability, DR resources can meet the WECC requirements for reserves. This equipment may be expensive, but at the correct price signals this is not a barrier. ERCOT and other ISOs currently manage this.

SCE Comment:

Slide 22: SCE agrees that WECC and CAISO rules that preclude demand response providers from providing regulation and spinning and limit the opportunity to provide non-spinning reserve are a market barrier. However, SCE believes that provision of ancillary services by demand response providers is a "niche" market that is not likely to be significant in the near term. Few customers have energy management systems with the telemetry and control necessary to provide "shallow DR". SCE has programs in this area of customer response and believes that this could be a more important element of a demand response program as technology develops over time.

Market Barriers

- ***Gaming and cost-shifting issues posed with nodal pricing of generation vs. aggregated pricing of load***
 - Fundamentally unfair to allow only some customers to choose nodal pricing for load.
 - PL with shift of load from aggregated LAP to nodal price will encourage DR at low-priced nodes.
 - PDR with load priced at aggregated LAP and DR priced at custom LAP also presents gaming opportunity.
 - MRTU move to only three LAPs makes problem worse.
 - If customers think others can game system, they will not participate.



Slide 23

CPUC Comment:

Slide 23: The CPUC staff believes that gaming and cost shifting issues are two very different concerns, and that these issues should therefore be addressed separately. Both issues are matters that the CPUC takes very seriously, and CPUC staff works diligently to identify and remedy these problems. CPUC staff expects that the CAISO and the DMM is doing likewise.

The CPUC staff seeks additional clarity about the first bullet on this slide, which claims that some customers will not be able to choose nodal pricing. It is the CPUC staff's understanding that the CAISO envisions that CSP's would likely be permitted to enroll any customers that have or are willing to install any technology necessary to facilitate DR service. Therefore, all customers would have the opportunity to choose nodal, or at least CLAP, pricing for DR services. Additionally, the CPUC staff understands that DR services will be separated from load for settlement purposes.

The fourth bullet on this slide is unclear. It states "MRTU move to only three LAPs makes problem worse." It is unclear, however, which problem is being referenced.

The CPUC staff does not believe that some DR resources ability to game the system will necessarily prevent others from participating. Gaming will likely reduce participation only to the extent that one DR customer's gaming has negative impacts on another DR customer. Furthermore, it can argued that if one party is involved in gaming that leads to cost shifting, then other participants not only have to attempt to bid in their DR, but must also learn from the gaming of others to shift costs back off of themselves.

CPower Comment:

Slide 23 - *Gaming and cost-shifting issues posed with nodal pricing of generation vs. aggregated pricing of load*. Again, CAISO in common with all ISOs, has extensive market surveillance capability, and techniques exist to eliminate these concerns on the generation side, for instance in load pockets. CPower believes this to be an implementation issue and is overstated as a barrier.

EnerNOC Comment:

Slide 23: *Gaming and cost-shifting issues posed with nodal pricing of generation vs. aggregated pricing of load*. This appears to be more appropriate in response to the Proxy Demand Response (PDR) proposal than to this study, and the wording itself identifies this as an issue, not a barrier.

SCE Comment:

Slides 23 and 26: The issue of whether the price of power delivered to load should be nodally and hourly disaggregated is a challenging one. SCE would support a conclusion that the complexity of the existing market structure is a barrier to the timely integration of DR in CAISO markets. The advanced metering on all customers will not be available for many years. Nodal assignment of loads (which will necessarily be dynamic rather than static) presents new challenges for the utilities that will require significant time and expense.

Regulatory Barriers

■ **Barriers to growth of CSP/ESP programs**

- CSPs are in a difficult position with utilities as both customers and competitors.
- CSPs currently acquire DR via bilateral contracts with the utilities, which include regular capacity payments. Customers seem to like this certainty, and may shy away from offerings with energy only revenue streams.
- Utilities are perceived to have significant advantages in terms of market power, influence with regulators, large staffs, ability to shift administrative costs.
- CSPs could be better suited to marketing, innovation and managing diverse customers, but are currently hindered by the hybrid market in California.



Slide 24

AReM Comment:

Slide 24: This slide title says it identifies barriers to growth of the Curtailment Service Provider (CSP) and Electric Service Provider (ESP) programs, but the text says nothing about ESPs. The issues listed in bullets 1 and 4 also apply to ESPs and the report should make that clear. In addition, the report should note that the current suspension of the direct access market stymies the development of DR programs by ESPs, which is a significant DR barrier.

CPUC Comment:

Slide 24: The CPUC staff is concerned that CSPs and ESPs are presumed to be the same type of entity in this slide. This presumption raises significant concerns for the CPUC. The California's suspension of Direct Access under AB1X prohibits the ability of ESPs to serve new customers. The CPUC will likely soon consider whether CSPs would be providing a service that is distinct from that of an ESP with respect to the current bar on the expansion of Direct Access. The issue of whether an ESP could also act as a CSP has also not yet been addressed by the state. The distinction between an ESP and a CSP is a point that needs greater clarity. This is particularly important because the CPUC has not yet made a determination, pursuant to Order 719, if there are any state rules or regulations that prohibit DR's direct participation in the ISO's markets.

The CPUC staff agrees that CSPs would be in a very interesting position in California. Not only would they try to balance their role as a customer/competitor, they are also in a position to see how the IOUs are using DR resources while managing a DR portfolio of their own. This benefit would arise from potentially managing the IOUs aggregator-run contracts that are bid into in the CAISO market, allowing the CSP to strategically schedule their other resources.

The CPUC staff believes that some consumers will likely shy away from energy-only revenues. Those resources that are well suited to provide DR will likely see benefits of doing so, and will still attempt to participate in retail DR programs and/or direct bid-in. For example, the energy payments could provide monthly revenues similar to a monthly capacity payment when the customer responds, but offers no payment and requires no penalty for non-response. Under this payment mechanism, customers will be better off staying in DR programs and simply responding when they are able and willing.

It is unclear to the CPUC staff how the hybrid market may hinder CSP growth and development. The California energy market is a hybrid in many ways. The specific "hybrid" attribute referred to is unclear. This bullet could be referring to either the difference between wholesale and retail pricing/rate making, or to a dual DR market comprised of CPUC funded IOU programs and non-CPUC funded CSPs. If the comment is addressing the difference between wholesale and retail pricing/rate making then the hybrid system can actually be used the advantage of the CSPs if CSP are selling DR into the CAISO market and being accepted primarily when prices are high (i.e., higher than the average cost pricing used for retail rates). If the concern is that CSPs cannot fairly compete with the IOUs ratepayer funded DR programs, then the concern could be better framed. This outcome is not inherent in the "hybrid market," but rather has come about through the historical development of CPUC DR programs over the years. As DR develops in both the wholesale and retail markets, the CPUC will continue to adjust its policy to attempt to maximize the benefits of DR resources. Stakeholders that feel this is a concern should provide greater detail about how the hybrid market is a barrier so that potential solutions may be analyzed.

PG&E Comment:

Slide 24: What is the concern in the second sub-bullet? What aspect of the current hybrid market structure prevents CSPs from offering customers a high fraction of remuneration through capacity payments?

SCE Comment:

Slide 24: SCE recognizes, but does not share, the CSP's viewpoint that they are both "customers and competitors" of the utilities. SCE views CSPs as business partners who can provide different and innovative demand response approaches and whose efforts help SCE achieve the goals of the "loading order". It is not appropriate to call problems with the CSP business model a DR barrier, however, since CSPs are only one of a number of structural forms in which DR can be provided competitively. (IOU delivery, direct load participation, and LSE participation are other structural forms.) Instead, the CAISO DR Barriers report should identify the underlying difficulties that CSPs face in making their business work as the barriers. This may include the lack of forward capacity markets and an inability to offer ancillary services.

Regulatory Barriers

▪ ***'Irreconcilable differences' between FERC/CAISO and Legislature/CEC/CPUC***

- Utilities/stakeholders want CAISO to push back with FERC in terms of requesting sufficient time to do things right rather than jump through hoops, and do it in conjunction with the CPUC directives. "Timely" does not mean "quick."
- Regulatory disconnect - how does the EE and DR loading order set by policy fit with running a wholesale market to determine appropriate balance.
- Reliability is fundamentally a state responsibility and political issue that the CPUC is not likely to turn over to the CAISO or wholesale markets, particularly given the experience of the energy crisis.
- California and CPUC see need for long-term planning in addressing multiple policy goals that are not achieved through short-term wholesale market as envisioned by CAISO.
- CAISO needs to be more proactive at identifying inconsistencies between FERC and California mandates and engaging California agencies in resolving them.



Slide 25

CPUC Comment:

Slide 25: The CPUC and the CAISO must work together on numerous matters to allow both agencies to fulfill their goals effectively. Any differences that exist between the CPUC and FERC/CAISO are not irreconcilable. Currently, staff from both agencies work collaboratively and continue to resolve barriers to broader DR use and acceptance.

The CPUC staff agrees that "timely" does not necessarily mean "quick." California has determined, through its Loading Order,[1] that DR is a very important resource. The CPUC staff is concerned, however, that forcing wholesale DR towards implementation by a set deadline could have inadvertent negative consequences. The CPUC staff does not want to have to completely rework direct wholesale DR participation shortly after its introduction or damage the public or political image of wholesale DR generally by creating a hastily-constructed mechanism.

The second bullet seems to imply that DR resources will not be able to compete with other resources in the CAISO market. EE and DR provide CAISO with numerous benefits, including smoother load profiles and reduced long-term load growth rates. The CPUC staff is unclear as to how EE policies create barriers to direct bid-in DR resources. Therefore, the CPUC staff seeks further clarity on this point. Furthermore, this bullet seems to imply that the CPUC is funding DR resources that will still not be able to compete with traditional generating resources. Therefore, the CPUC staff seeks further explanation on this point. Furthermore, the CPUC and CAISO continue to work together to find the proper balance of resources to fulfill California's short and long-term energy needs.

Through tools such as LTPP and RA, the CPUC staff expects that effective long term planning will prevent most short term problems. Additionally, for the rare instances in which the CPUC's procurement programs do not address short term grid operational needs, the CPUC support various CAISO backstop procurement mechanisms such as RCST, ICPM, and Exceptional Dispatch.

EnerNoc Comment:

Slide 25: *'Irreconcilable differences' between FERC/CAISO and Legislature / CEC / CPUC.* The jurisdictional issues included are definitely challenges, but they don't appear to be true barriers.

PG&E Comment:

Slide 25: The first bullet is particularly relevant to the issue of "time" as a barrier. This slide raises many important points, however; we do not believe that the issues are "irreconcilable."

SCE Comment:

Slide 25: This is not a DR barrier.

Regulatory Barriers

- ***Political resistance to reflecting dynamic or locational pricing in retail rates***
 - AB 1X prohibits default dynamic pricing for residential customers.
 - Area-specific rates are politically very difficult / impossible to implement.
 - Cities like San Francisco and San Diego where high nodal prices are likely have significant political power and oppose locational pricing for retail pricing applications.
 - Makes it difficult to align pricing for generation, load and DR resources; misalignment may lead to gaming opportunities, cost shifting and perverse incentives.

CPower Comment:

Slide 26: *Political resistance to reflecting dynamic or locational pricing in retail rates.* Since it is not a requirement to have dynamic pricing in retail rates for direct wholesale participation of demand response services (and DR may be viewed at the wholesale level simply as negative generation), this does not appear to be a barrier.

EnerNOC Comment:

Slide 26: *Political resistance to reflecting dynamic or locational pricing in retail rates.* Dynamic prices are not a requirement to have direct wholesale participation of demand response services, so this appears to be an issue rather than a barrier.

SCE Comment:

See Slide 23:

Regulatory Barriers

- ***Program value may not be fully recovered in wholesale market***
 - Funding for incentives, AMI, auto DR or other enabling technologies currently comes through CPUC to the IOUs and then to customers. Unclear how getting monies to customers for enabling technologies would work under direct participation or CAISO “product” model.
 - CPUC-approved IOU DR programs reflect multiple policy priorities and program costs may not be fully recovered in wholesale markets.
 - Some say all funding should come from the market. If costs can’t be recovered from the market, either the market structure is wrong or DR isn’t as valuable as current payments suggest.
 - Market-based funding may overcome litigation over administrative pricing and challenges surrounding cost-effectiveness evaluation.

PG&E Comment:

Slide 27: PG&E agrees with the third sub-bullet. This point clearly reflects the spirit of our approach to cost-effectiveness.

SCE Comment:

Slide 27: The title of this slide doesn’t match the bullet points. Moreover, this is not a DR barrier. The CPUC has been very supportive of IOU efforts to promote enabling technologies; the apprehension that this support may disappear in the future is simply a concern.

Regulatory Barriers

- ***Mixed signals from 5% DR goal, EAP loading order and cost-effectiveness protocols***
 - Cannot take on DR policy in isolation; need to look at myriad of other policy issues that are intertwined like GHG mitigation, how wholesale prices may be impacted by legislative push for once through cooling, whether or not direct access will be allowed to return to CA, or will go back to full vertical integration. Many of the policy links will only be resolved over time.
 - From a utility/CPUC perspective, DR is judged by its cost-effectiveness - but there is little clarity on how to calculate C/E on DR resources.
 - 5% goal focused utilities on enrolling the maximum MW, not the most cost-effective.



Slide 28

CPUC Comment:

Slide 28: The CPUC is in the process of developing a DR Cost Effectiveness Protocol for CPUC authorized DR programs. Once this protocol is in place, the CPUC will be able to compare the cost effectiveness of various resources and authorize the best portfolio. The CPUC is attempting to achieve a delicate balance between creating a robust DR market and finding cost effective DR resources while the DR market is in its infancy. However, it should be noted that the California's Loading Order focuses on cost effective DR and price responsive.”[

CPower Comment:

Slide 28: *Mixed signals from 5% DR goal, EAP loading order and cost-effectiveness protocols.* These are policy issues that can be resolved by the appropriate authorities, and so should not be a barrier to direct participation.

EnerNOC Comment:

Slide 28: *Mixed signals from 5% DR goal, EAP loading order and cost-effectiveness protocols.* There are a number of policy issues that are unresolved, but this does not appear to be a barrier to direct participation.

PG&E Comment:

Slide 28: We disagree with the characterization in the last bullet that utilities ignore cost-effectiveness in the process of trying to meet their DR goals.

SCE Comment:

Slides 28, 29 and 36: These slides identify complaints, not barriers. The underlying barrier is the complexity of market structure and design, which makes it difficult to integrate DR into CAISO market operations. Ultimately, the implication of this complexity is that it takes substantial time to work through details.

Regulatory Barriers

- ***Multiple initiatives overwhelming capacity of stakeholders and market participants***
 - CAISO relying on storage stakeholder process to define AS requirements for DR, but requirements are not similar.
 - Stakeholders with limited staff must choose between attending Storage, DR, RA, MRTU proceedings (among others) at FERC, CPUC, CEC and CAISO.

CPower Comment:

Slide 29: *Multiple initiatives overwhelming capacity of stakeholders and market participants.* It would seem that the stakeholders involved need to find a way to prevent this from becoming a barrier to direct participation at CAISO (and this is not something that would seem appropriate in a response to FERC).

EnerNOC Comment:

Slide 29: *Multiple initiatives overwhelming capacity of stakeholders and market participants.* It is true that stakeholders and market participants are pulled in multiple directions at any given time, and this is a challenge of participating in the California market but it should not be a barrier to direct participation at CAISO.

SCE Comment:

See Slide 28:

Customer Participation Barriers

- ***Utilities and Regulators fundamentally underestimate challenge of changing customer behavior***
 - Utilities and regulators underestimate resistance to allowing utility or government control (witness the rejection of CEC PCT requirement).
 - Economic DR has no parallel in other markets and is a strange concept to customers – being paid not to do something you would otherwise do. Emergency programs have parallels (e.g. rationing seats on overbooked airlines), but economic programs?
 - Utilities core competency is not marketing and innovation.
 - Customers don't like it when programs or bills change.



Slide 30

CPower Comment:

Slides 30 and 31: *Utilities and regulators fundamentally underestimate challenge of changing customer behavior. Complexity of market from customers' perspective.* It is the entire business model of CSPs to simplify and manage these challenges on behalf of the customers and other stakeholders, and so this is not a barrier.

EnerNOC Comment:

Slides 30 and 31: *Utilities and regulators fundamentally underestimate challenge of changing customer behavior. Complexity of market from customers' perspective.* Third-party DR providers make it their entire business to simplify the customers' participation in both retail DR programs and wholesale DR markets, so this is not a barrier.

PG&E Comment:

Slide 30: PG&E does not agree with the bullet: "Utilities core competency is not marketing and innovation." In addition, this slide states "Utilities and Regulators fundamentally underestimate challenge of changing customer behavior." Based on this phrasing we think that the CAISO should be included in this title as well.

SCE Comment:

Slides 30, 31 and 32: These are not barriers. If the CAISO uses any of this material in the DR Barriers report (which SCE doesn't support), then these slides need to be better focused to separate the issue of overcoming customer "inertia" (resistance to change) from the issue of customer reasons to not participate in demand response. The former is an issue that can be addressed through educational efforts, word of mouth, etc. SCE strongly disputes the suggestions on Slide 30 that we "underestimate these challenges" and are not competent in marketing DR programs. We very much appreciate the challenges of marketing DR and have one of the largest and most successful DR programs in the world.

Customer Participation Barriers

- ***Complexity of market from customers' perspective***
 - In order to elicit interest among the customer base, DR offerings need to be simple, with consistent rules and expectations over time, and provide a tangible benefit to the customer.
 - Multiple stories of time and effort required to get relatively knowledgeable customers educated and comfortable with MRTU and PDR.
 - Customer lack of appetite for perceived risk when it comes to a basic commodity like electricity – their core business is something else.
 - CAISO requires participants to have or be an SC which requires significant investment in time and resources.

CPUC Comment:

Slide 31: The CPUC recognizes the numerous concerns regarding customer education, and continues to fund programs aimed at overcoming these barriers.

CPower Comment:

See Slide 30:

EnerNOC Comment:

See Slide 30:

SCE Comment:

See Slide 30:

Customer Participation Barriers

- **CAISO market requirements are ill-suited for many customers**
 - Once customers understand requirements of participating in RA/Capacity markets, they will likely find it unattractive (level of control ceded to CAISO, number of calls, poor accommodation of “use limited” resources). Customers are ‘protected’ by the utilities and CPUC now.
 - Few high use sophisticated energy consumers have the resources and desire to understand the nuances of the wholesale/retail electricity market, especially in terms of price-based products.
 - Customer need for simplicity and consistency is in conflict with volatility in wholesale electricity markets.



Slide 32

CPUC Comment:

Slide 32: The first bullet implies that complexities of participating in the RA/Capacity market will act as a deterrent to direct bid-in participation and that the CPUC and utilities ‘protect’ customers now. It is unclear what actions towards protection of consumers by the CPUC and utilities may create barriers to direct participation. The CPUC staff understands that protections such as use-limits and the number of times a unit can be called in a given period will still be honored by CAISO, and that the “protections” attributed to the CPUC and utilities in this bullet will continue to be honored by CAISO. Though few customers may have the sophistication to understand the nuances of the wholesale and retail electricity markets, the CPUC staff anticipates that they will not need to. CPUC staff believes that only end use customers that wish to be their own SC will have to understand the details of the wholesale and retail electricity markets. Most end use customers will simply have to understand the terms of payment and performance obligations detailed in the contract with a CSP. This appears to be an area of for great value to be added by aggregators. CPUC staff believes the items on this slide can be equally viewed as both a hurdle and an opportunity.

SCE Comment:

See Slide 30:

Infrastructure and Technology Barriers

- ***Scheduling Coordinator/Transmission level requirements for participating load***
 - Cost of telemetry currently envisioned to provide 4 second data will be exorbitant for the foreseeable future.
 - SC/Transmission level telemetry requirements are costly, onerous and unrealistic for distribution level customers.

AReM Comment:

Slide 33: The current CAISO DR rules were developed for customers connected at transmission-level voltages. The report should state that these rules should be re-evaluated and revised to address customer participation primarily at distribution-level voltages.

SCE Comment:

Slides 33, 34 and 35: Cost and technological limits (such as telemetry requirements and the lack of smart appliances) are not barriers, but rather realities in which demand response programs must operate. If telemetry requirements are unnecessary, then imposing them on demand response participants could be seen as a barrier even if generation resources are treated comparably. However, reasonable but costly infrastructure and systems costs simply raise the issue of whether specific types of demand response are cost effective.

Infrastructure and Technology Barriers

- ***Infrastructure and systems costs associated with locational marginal pricing***
 - Infrastructure costs for the IOUs associated with mapping customers to CAISO nodes, especially when circuits and the customers assigned to them are not static, may be significant.
 - Costs and time to implement communication and data exchange linkages between the customer, CSP, LSE, and CAISO will be significant.



Slide 34

CPUC Comment:

Slide 34: Are the infrastructure costs associated with mapping customers restricted to IOUs? Will CSP's face similar challenges as they gain and lose customers? Though creating the necessary data and communication links will take time, the CPUC staff expects that the Participating Load Pilot, which is scheduled to commence in the summer of 2009, will help the CAISO and market participants to develop this infrastructure.

EnerNOC Comment:

Slide 34: *Infrastructure and systems costs associated with locational marginal pricing.* It is EnerNOC's understanding that the IOUs are required to map customers to CAISO nodes as part of LMP implementation under MRTU, so this appears to be an argument against LMP rather than a barrier to direct participation.

SCE Comment:

See Slide 33

Infrastructure and Technology Barriers

▪ ***Limitations of AMI***

- Standard for WECC / CA ISO telemetry is not met by AMI systems which record data on an hourly interval for residential customers.
- To make AMI more DR enabling, one needs smart appliances; those are slow to roll into the market through appliance replacements, so that will be a longer term consideration.

SCE Comment:
See Slide 33

Operation and Settlement Barriers

▪ **Load Forecasting Challenges**

- With direct participation via CSPs that involve bundled customers, concern around load forecasting implications.
- Barrier or issue around separating DR capability as called upon by the CSP as a resource from its embedded position within the LSE's load forecasting function.
- System operators lack of experience with price-based, behavior-driven DR translates to a lack of confidence in its ability to deliver MW reductions.



Slide 36

EnerNOC Comment:

Slide 36: *Load Forecasting Challenges*. Separation of DR from load could be a challenge, but if the IOUs do the load forecast based on contracted MWs for CSPs, and CSPs do the demand reductions, this doesn't appear to be a barrier.

PG&E Comment:

Slide 36: This slide says: "System operators lack experience with price-based, behavior-driven DR translates to a lack of confidence in its ability to deliver MW reductions." This is an important issue that will require time and effort to resolve.

SCE Comment:

See Slide 28:

SCE Comment:

Slide 36: SCE agrees that issues regarding how to separate demand response from the associated load has been a barrier, or at least an impediment, to the development of a direct participation demand response framework. If the demand response is required to accompany load then participation is limited to Load Serving Entities, and moreover the demand response is limited to the capability of serving one's own load. For example, if the DR and Load are inseparable parts then a LSE can offer a demand response program to customers whose native load is also served by the LSE. A LSE whose existing demand response programs that cross LSE boundaries, specifically retail participants that receive benefits from a CSP and receive their load service from a different entity that is their LSE, is not able to participate in the wholesale market directly. The LSE is able to participate in the wholesale market with retail participants who receive both their CSP and LSE services from them, the same entity. But, where the LSE is serving only the function of CSP, those retail participants can only be served if the participation can be separated. The separation of DR and Load as modeled CAISO's PDR solves FERC's interest in providing direct participation for demand response in wholesale markets. The PDR model proposed by the CAISO attempts to resolve the principal barrier of a LSE serving DR, as a CSP, that belongs to another LSE. In other words, the PDR allows the CSP to serve DR independently of the LSE and participate directly with CAISO wholesale markets. That barrier between a CSP and DR when the DR belongs to another LSE is significant and makes the separation of demand response capability from the load consumption necessary. The final bullet point on this slide is a concern, not a barrier.

Operation and Settlement Barriers

- ***Inherent compromises in balancing multiple objectives of baseline methodology***
 - Some see need for single uniform transparent methodology to gain customer acceptance.
 - Inherent inaccuracies lead to gaming opportunities and cost-shifting.
 - CPUC workshop report in RA proceeding proposes that all DR aggregators must comply with 150 page load impact protocols. Protocols are set up for long term planning and cost-effectiveness, not relevant for CSP/ESP program operations.



Slide 37

AReM Comment:

Slide 37: The discussion about the proposed requirement that ESPs/CSPs meet IOU cost-effectiveness rules (in CPUC Proceeding R.08-01-025) should be deleted from this section (“Operation and Settlement Barriers”) and moved to “Regulatory Barriers,” which discusses the cost-effectiveness requirements (see Slide 28).

CPUC Comment:

Slide 37: The CPUC staff believes that any DR resource that wishes to receive a capacity payment must adhere to the Load Impact Protocols. The load impact protocols are the only way the CPUC is able to verify the load reduction capabilities of a DR resource. However, the CPUC staff is unclear how adherence to the Load Impact Protocols creates a barrier to direct bid-in demand.

CPower Comment:

Slide 37: *Inherent compromises in balancing multiple objectives of baseline methodology.* This is an issue inherent in all DR programs, both as managed by utilities and in IOU programs nationwide. There has been, and continues to be progress toward a common framework to form the foundation for any particular implementation. Again, CPower considers this overstated as a “barrier”.

EnerNOC Comment:

Slide 37: *Inherent compromises in balancing multiple objectives of baseline methodology.* EnerNOC is an active participant in baseline discussions and proceedings in California and will attest that developing a standard baseline methodology is challenging, but we do not perceive this to be a barrier to direct participation. The aggressive timing CAISO is proposing for baseline development may be a barrier. However, EnerNOC is committed to work with CAISO and the stakeholders in developing a baseline methodology to meet a May 2010 implementation target.

SCE Comment:

Slide 37: These are concerns about how measurement is performed, not DR barriers.

Wrap Up and Next Steps

- Review overall presentation findings
- Solicit additional over-arching comments
- Review schedule for comments to be submitted by Apr 17
- We will work to incorporate comments into the final study that will be filed with FERC on Apr 28

Feedback and Comments:

Please submit feedback and comments to:

John Goodin
jgoodin@caiso.com

by
April 17, 2009

Thank You!