



**Comments of the *Environmental Defense Fund*  
On the California Independent System Operator  
Demand Response and Energy Efficiency Roadmap:  
Making the Most of Green Grid Resources  
Draft June 12, 2013**

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## **I. Introduction**

Environmental Defense Fund (EDF) is a national non-profit consisting of passionate, pragmatic environmental lawyers, economists and scientists who believe in prosperity *and* stewardship, focusing on the most critical environmental problems. EDF appreciates the opportunity to provide comments to the California Independent System Operator (CAISO) on their “Demand Response and Energy Efficiency Roadmap: Making the Most of Green Grid Resources” Draft of June 12, 2013. EDF agrees with the CAISO that demand response (DR) and energy efficiency (EE) will play a crucial role in the transition to our clean energy future, and we fully support the CAISO in developing this roadmap.

## **II. Principles**

In this section we provide some high level principles that we believe will help guide this roadmap toward increasing DR and EE participation in the CAISO markets.

### **A. Learn from Others**

The successful EE and DR markets that exist in other parts of the United States can provide valuable examples and lessons to inform California’s market designs. For example, PJM has successfully developed a forward capacity market that includes contributions from DR and EE. The latest PJM auction procured over 12 GW of DR and 1100 MW of EE.<sup>1</sup>

EDF is not suggesting that California needs to develop a forward capacity market. However, there are elements of the PJM market that seem to encourage the kind of robust participation in DR and EE that California is seeking to create. While keeping in mind California’s unique

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<sup>1</sup> [PJM Press Release, May 24, 2013](#)

characteristics, we suggest examining the key elements of the PJM approach that have enabled them to achieve such results:

### **1. Simplicity and Transparency**

Simple and clear market rules In PJMs capacity market, along with capacity prices that clear in a transparent auction, provide not only clear price signals to market participants but also create a stable environment within which to rationally make such investment decisions. Additionally, the rules for participation are simple and straightforward. There are two ways that an EE or DR resource can participate in the PJM markets: either 1) through a Curtailment Service Provider (CSP) (which is analogous to a DR Provider in California) or 2) as a direct member of PJM itself.

### **2. Appropriate Compensation Mechanism Must Exist**

Without an appropriate compensation mechanism that reflects its value to the system, sufficient development of DR resources will not occur. The value of DR comes from its ability to replace energy (negawatts), from its ability to provide capacity to the system operator, and from its ability to provide ancillary services such as regulation or operational reserves.<sup>2</sup> In markets like California's with an energy price cap, the ability to garner sufficient revenue from energy payments alone is limited, especially since DR resources are only able to receive full Locational Marginal Price (LMP) compensation in the limited hours when a net system benefit can be demonstrated.<sup>3</sup> When revenue from energy compensation is limited in this way, capacity payments provide a crucial way to incentivize development of these resources. PJM has been successful in bringing DR resources to market in part because the forward capacity market provides a transparent and market based mechanism for valuing and compensating DR resources for their capacity value. While EDF is not definitively advocating for a forward capacity market in California, we do recognize the significance of being able to transparently value and compensate DR resources for their capacity contributions.

### **3. Valuation Based on a Forward Contract**

Any valuation of capacity that does not consider its forward value across some extended period of time – for example, a three year look ahead is used in the PJM market – runs the risk of being subject to boom-bust cycles: If excess generation resources exist at a given time, then capacity that is valued based on spot market prices will be extremely low, reflecting the low value of adding additional capacity. This results in little to no procurement of capacity. In contrast, if insufficient generation resources exist at a given time, then capacity values in a spot market will spike. Basing capacity prices on a multiyear forward contract, instead of a spot market – or in the case of California, a one year contract – will mitigate risk of a boom-bust cycle by providing a longer time horizon within which to value such capacity.

We consider the elements above to be some features of a successful approach that may help incorporate more DR and EE into California's energy markets as it strives to develop a clean energy future at least cost. A further, more detailed study of other successful markets such as PJM and ERCOT would also help inform any decisions being made in developing this roadmap.

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<sup>2</sup> Current WECC definitions limit the ability of DR from providing spinning reserves.

<sup>3</sup> See [CAISO DR Net Benefit Test](#)

## **B. Experience is Crucial**

While California has experience with pilot programs that clearly demonstrate the ability of DR to provide valuable system capabilities,<sup>4</sup> California lags behind the rest of the country in utilizing DR resources to meet our growing system needs. In the short term, California should continue developing pilot programs specifically aimed at substantially solving our near term local reliability issues resulting from the recent SONGS as well as ongoing OTC retirements. Pilots should be developed to provide the CAISO with experience in managing DR resources supplied by all customer classes and providing a range of services to meet local needs from operational reserves to frequency regulation. Direct experience with such pilot programs will not only address these near term needs, but may pave the way for a better understanding of how to develop robust solutions and rules governing resource participation in the future.

EDF is working in partnership with Southern California Edison (SCE), Lawrence Berkeley National Laboratory's DR Research Center, and the US Green Building Council to demonstrate automated DR (ADR) amongst Leadership in Energy and Environmental Design (LEED) commercial buildings in the SCE service territory. California can continue to learn from this and other DR programs being developed throughout the country.

## **C. Allow Markets to Function**

Creating clear and transparent market rules that provide the proper financial valuation and incentive mechanisms will encourage third party participation in DR and EE and will unleash the ingenuity and creativity of market forces. The CAISO and the CPUC should strive to develop opportunities for third party participation that encourage creativity allow for outside-the-box options.<sup>5</sup>

EDF fully supports efforts by the CAISO and the CPUC to simplify the ways in which DR is able to provide valuable system support. Current requirements for participation of DR are extremely complex and work against development of DR resources. For example, the CPUC has required DRPs to specify their DR contributions at the sub Load Aggregation Point (LAP) geographical resolution in order to satisfy IOU RA obligations at the Local Capacity Requirements (LCR) level. While there is no doubt that DR is able to provide support in satisfying IOU LCRs at this level of granularity, placing this requirement on DRPs for participation in retail DR programs compromises their ability to develop portfolios of geographically diversified DR resources. Portfolios of diversified DR resources are much easier for DRPs to manage when reliably meeting system needs.

Markets also need access to customers to function well. For example, restrictions keep DRPs from bidding the load from IOU bundled customers into the CAISO's wholesale market. While IOUs provide a full range of conventional services to these customers, innovative DR-based business models were not considered in depth with the development of the IOU regulatory framework. This misalignment with regulatory framework and technological innovation has contributed to the lackluster development of DR resources in California. Addressing these issues, while allowing DRPs access to bundled customers, would provide a more competitive environment for the development of DR programs within California.

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<sup>4</sup> See, for example, [CAISO 2009 Participating Load Pilot Project Report](#) as well as the [Southern California Edison Demand Response Partnership Program](#)

<sup>5</sup> See for example, [Colorpower](#)

#### **D. DR is not Conventional Generation**

While EDF is encouraged by this initiative to create a roadmap for more robust participation of DR and EE in the CAISO markets, we are concerned by the preferential treatment being given to conventional resources to solve the forecast system flexibility needs as considered in the CAISO's Flexible Resource Adequacy Capacity Must Offer Obligation (FRACMOO) initiative.<sup>6</sup> DR is not the same as conventional generation, and only counting DR towards satisfaction of flexibility needs if and only if it is able to behave in an identical manner to conventional generation will exclude DR from participating in these new markets<sup>7</sup> and incentivize unnecessary procurement of gas resources to satisfy these needs. Over procuring gas resources will flood the market with alternatives to DR and EE, and will make it challenging for utilities to meet California's loading order.

PJM has approached this issue by evaluating what the grid needs and creating programs based on those needs – an approach that levels the playing field for all resources. Those sources that match the needs most closely get incentivized on par with the value they provide, based on the needs of the grid.

#### **E. Account for the Capacity Value of DR**

Only through incentive mechanisms that transparently capture the system value of these resources will more widespread adoption of DR be achieved. One of the values of DR comes from its capacity. While DR provides virtual generation - which has value based on its energy content - such DR resources are typically only required for short periods of time, so that the compensation arising from the energy value is relatively small. Apart from its value as an ancillary service providing regulation or operational reserves, the primary value of DR therefore arises because peak load conditions are mitigated. Unfortunately, this value is not properly captured in the existing wholesale markets. In addition, while DR resources can conceivably be aggregated so they are able to ramp across several hours and satisfy the CAISO's requirement for the proposed flexible ramping capacity, DR actually mitigates the need for such multi hour ramping products.

#### **F. A Simplified User Experience May Incentivize More Retail Participation**

The California Flex Alert program<sup>8</sup> is a good example of how individual customers are willing and able to help mitigate critical reliability events. Last summer, Flex Alerts were able to reduce load during peak temperature events. A simple public safety announcement was sufficient to encourage targeted conservation by appealing to the individual's civic responsibility. No other financial incentive was provided. Based on this experience, it is reasonable to assume that rate payers will be willing to do more, but only if the user experience is simple and appeals to their civic responsibility. Given the enormous potential of tapping into the retail DR market, the user experience must be considered.

Within the CPUC's residential rate design initiative, EDF and others are advocating for default Time Of Use (TOU) retail rates. We believe default TOU rates will provide price responsive DR and help mitigate system peak load conditions. However, the challenges to codifying default TOU rates are considerable. If a simple user experience was developed with a clear value proposition, say for example by enabling technologies that automatically take advantage of real

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<sup>6</sup> [CAISO FRACMOO](#)

<sup>7</sup> See, for example, [Enernoc Comments on CAISO DR and EE Roadmap Workshop, 5/28/13](#)

<sup>8</sup> See <http://www.flexalert.org/>

time price signals, perhaps managed by third party aggregators, then more DR participation could be achieved in the IOU retail programs.

### **G. The Distinction Between Supply and Demand Side DR is Not Black and White**

The CAISO has been developing a conceptual framework for considering DR as either supply side, namely dispatchable directly by the system operator, or demand side, namely price responsive. However we do not believe this distinction is so clear, and in fact embracing the grey area could open up more retail participation. We note, by contrast, that no such distinction is made in the PJM market, and yet by all measures the PJM markets are functioning well.

For example, if a DRP is able to aggregate a geographically diverse portfolio of retail DR resources, and if the CPUC, through their ongoing work on Rule 24,<sup>9</sup> is able to clear the way for direct participation by DRPs in the wholesale markets (specifically in the CAISO's Proxy Demand Response (PDR) program<sup>10</sup>) then the DRP will be able to provide dispatchable DR to the CAISO wholesale markets without requiring each individual load participating in the DRP program to be directly telemetered by the CAISO. Instead, the diversity of a portfolio of individual loads can be modeled statistically by the DRP to ensure performance metrics within thresholds that will enable reliable participation of the aggregated portfolio directly in the wholesale markets.

There is no reason to require all load participating in the wholesale markets to be individually telemetered by or even registered with the CAISO, as is the current practice, especially when such loads can be aggregated and managed by the DRP. Telemetry solutions already exist that enable a DRP to manage their portfolio of participating DR customers while providing the CAISO with reliable DR performance. Furthermore, developing appliance standards that incorporate telemetry functionality and protocols will lead to more widespread adoption of such approaches in the future, as more appliances with this capability increase in number.

The CAISO is concerned with the operational complexities of having to manage huge numbers of individual, small, DR resources injecting virtual energy into the grid. But this concern results in part by thinking about each individual load as having to either be a supply side or demand side resource. By considering the impacts of aggregation on a diverse portfolio of DR resources, the CAISO could relax some of the more stringent telemetry requirements. Such approaches are already being successfully employed in other markets throughout the country.

### **H. Realistically Incorporate DR and EE into Forecasting**

Current forecasting done by the CAISO does not adequately represent California Energy Commissions (CEC) Integrated Energy Policy Report (IEPR) EE or DR projections nor is it consistent with the state's loading order. Part of this discounting is due to a lack of confidence that these resources will show up on operational timescales to meet net load, as they have proven themselves to do in other states. We believe that when sufficient experience has been developed and confidence built around how DR and EE are able to participate in the CAISO markets, it will be possible to realistically incorporate DR and EE into forecast models. With this

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<sup>9</sup> Given the importance of Rule 24 in developing a pathway to direct participation by DRPs into the wholesale markets, it is somewhat unfortunate that the CPUC has elected to use an advice letter process for the final review and approval of the rule. Such an approach lacks transparency and limits the ability of advocates to participate in the process.

<sup>10</sup> The requirements for providing DR at the sub Load Aggregation Point (LAP) level would need to be relaxed, since this requirement reduces the value of aggregation across a diverse DR portfolio.

experience, the CAISO will be able to inform the CPUC Long Term and Procurement Planning (LTPP) and RA processes as well as local capacity needs and transmission and distribution planning in a manner that fully values DR and EE consistent with California's loading order.

### **III. Conclusions**

EDF fully supports the CAISO in their efforts to establish a roadmap towards adoption of robust DR and EE programs in the CAISO markets. Achievement of these goals will keep California on track to meeting its loading order, reduce system costs, and lead to the least cost integration of renewable resources. We have attempted in these comments to lay out a series of principles that can be used to assist in this goal. The underlying theme of these principles is: California's energy policy makers must work together to ensure that proper incentives exist for the IOUs, demand response providers and customers.

Under the current rate of return regulation model, though, the IOUs lack financial incentives to develop successful demand response programs. Furthermore, the extensive restrictions that have thus far been placed on DR providers (DRPs) severely limit their ability to participate in wholesale markets. Under these conditions, California will be far from developing the robust DR markets that policy makers envision.

In its cost allocation principles, CAISO is now proposing that the costs of balancing the grid due to uncertainty and variability in net load<sup>11</sup> should be paid for by clean generation resources such as wind and solar, the very same resources that California is developing in our attempt to move to a clean energy future. This strong departure from current practice - where the system costs of balancing supply and demand have historically been socialized across load - will further reduce IOU's incentive to deploy DR resources, especially without a transparent mechanism for valuing their capacity.

The roadmap that is the subject of these comments will work to align the incentives and allow California to reach our clean energy goals. EDF thanks CAISO for the opportunity to assist in this transition to our clean energy future.

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<sup>11</sup> Net load is system load minus wind and solar generation