BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking To Enhance the Role of Demand Response in Meeting the State's Resource Planning Needs and Operational Requirements.	Rulemaking 13-09-011 (Filed September 19, 2013)

RESPONSES TO PHASE TWO FOUNDATIONAL QUESTIONS OF ENVIRONMENTAL DEFENSE FUND

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1. Introduction

The Environmental Defense Fund ("EDF") thanks the California Public Utilities Commission ("CPUC" or "Commission") for this opportunity to respond to the Phase Two Foundational Questions raised in the CPUC Joint Assigned Commissioner and Administrative Law Judge Ruling and Scoping Memo ("DR Scoping Memo").[1]

This proceeding represents an opportunity to significantly improve how Demand Response ("DR") programs are developed, administered, and implemented in California. Examining and addressing foundational DR issues related to bifurcation, cost-allocation, and back-up generation is instrumental to this end, as decisions made in this proceeding will form the basis for consequent program development and deployment.

EDF believes that the proposed bifurcation, if created, should ensure equitable attention and treatment between not only types of DR, but between DR and generation resources. Categorization can be helpful in better understanding and administering DR, but should not be done to the detriment of any particular DR resource. Likewise, cost allocation should reflect

[1] Role of Demand Response in Meeting the State's Resource Planning Needs and Operational Requirements, R. 13-09-011 (issued Nov. 14, 2013).

underlying marginal cost and revenue allocation methods that properly motivate efficient behavior.

This proceeding also represents the opportunity to apply forward-thinking solutions to issues that cut across a host of challenges important to California. For example, back-up generation, currently a poor solution to providing emergency load from an environmental standpoint, could be re-deployed in such a way that it creates a path towards cleaner reliability. As detailed herein, EDF proposes a possible avenue in this regard: natural gas and diesel back-up generators can be replaced as they depreciate or as part of expansions by clean storage devices, networked into the grid, to provide flexible capacity services. This approach would enable back-up owners to secure economic benefits from an otherwise sunk cost investment and help the utilities meet current storage capacity requirements.

In sum, EDF supports the following in respect to the foundational issues considered herein:

- If the Commission bifurcates DR resources, both demand- and supply-side resources should be treated in commensurate fashion;
- Overall compensation between DR and generation resources should be commensurate among resources, and provide opportunity to third parties;
- An examination of the characteristics of demand- and supply-side resources, matched with possible transition pathways and future regulatory treatment, is merited, with one possible approach outlined herein;
- The Commission should develop a least-cost curve of demand- and supply-side resources, and focus on developing the right mechanisms to draw in the most beneficial, cost-effective resources. Where possible, markets should be created to harvest these resources in a low transaction cost manner.

- Existing natural gas and diesel back-up generators could be replaced as they depreciate or as part of expansions by storage devices, networked into the grid, and provide flexible capacity services. This approach would enable back-up owners to recoup their investment, and, if linked with renewable generation, produce clean energy. It would also help the utilities meet current requirements to rapidly increase storage capacity. EDF proposes that a pilot along these lines be included as part of this OIR.

An approach to DR consistent with the thoughts provided herein have the potential to not only aid the Commission in achieving its DR goals, but will contribute to State clean energy objectives and other Commission targets.

2. Bifurcation

A. The Order Instituting Rulemaking ("OIR") defines the demand-side programs as customer-focused programs and rates, and supply side resources as reliable and flexible demand response that meets local and system resource planning and operational requirements. Please comment on the terms, demand-side and supply-side resources, and the definitions provided. If you disagree with the terms and/or definitions, please provide your recommended changes and explain why your recommendation is more appropriate.

Definitions are useful to the extent that they enhance communication, create insight, and provide a basis for action. Designating an apple as an apple is helpful, for example, as it conveys a common agreement that it is a certain type of fruit (communication), which can be eaten (insight), and should be planted (action). From this perspective, it will only be useful to bifurcate demand response programs into demand- and supply-side resources if by so doing all three of the above elements are achieved.

The DR OIR in this proceeding suggests that demand-side DR consists of "customer-focused programs and rates," while supply-side resources are "reliable and flexible demand response that meets local and system resource planning operational requirements."[2] Though supply-side resources would not seem to be able to meet the demand-side definition, the opposite is not true. That is, demand-side resources can be reliable, flexible, and (help to) meet local and system resource planning operational requirements.

For example, tariffs and other types of DR can be reliably forecasted to achieve a range of demand changes, and, once in place for some time, can be as predictable (i.e., reliable) as generation. Likewise, tariffs, and DR in general, are arguably more flexible than other resources, in that rate structures and programs can be altered as needed, and include elastic price triggers. The purpose of marginal cost-based rates is to provide energy users with an accurate signal of the expenses they impose on the utility system, as exhibited through tariffs and other incentive structures, so that utility planners can properly plan for the resulting operational requirements. When in tight sync with underlying costs, tariffs can contribute to reliability, and thus pricing can become a key control lever.

EDF is concerned that the DR Scoping Memo further attempts to define DR resources by proposing differing methods to increase penetration levels for demand-side resources ("improved program effectiveness") and supply-side resources ("increased and expanded participation in CAISO energy markets").[3] Said differently, supply-side resources would be categorized as those subjected to California Independent System Operator ("CAISO") energy markets, while demand-side resources would be outside of this realm.

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[2] Role of Demand Response in Meeting the State's Resource Planning Needs and Operational Requirements, R. 13-09-011 at 14 (issued Sept. 25, 2013)("DR OIR").
[3] DR Scoping Memo at Attachment 1 page 1.

This definition is inadequate to pinpoint which resources should be considered demand- or supply-side – particularly when a resource has overlapping characteristics – and would require additional work to create the basis for "insight" and "action". For example, why should demand-side resources be outside the CAISO market, and left to the passive realm of "improved program effectiveness?" Bifurcation should not undermine the potential to fully activate demand-side DR's potential by creating barriers to accessing markets.

Given the above, EDF believes that a careful examination of the characteristics of demand- and supply-side resources, matched with possible transition pathways and future regulatory treatment, is merited.[4] For example, Table One below illustrates a possible framework with which to define and map different DR resources. In the table, "demand" is defined as resources that are load modifiers, and whose impacts are reflected in the California Energy Commission's ("CEC") load forecast, as suggested in the OIR, while "supply" consists of resources that are only triggered when needed.

[4] This OIR should also be coordinated with the CAISO's DR roadmap. Cal. Indep. Sys. Operator, *Demand Response and Energy Efficiency Roadmap: Making the Most of Green Grid Resources* (June 12, 2013), http://www.caiso.com/Documents/Draft-ISODemandResponseandEnergyEfficiencyRoadmap.pdf.

Table One: DR Mapping

Resource	**Supply**	**Demand**	**Services (e.g., energy, capacity, voltage support)**	**Incentive Mechanisms/ Market Access**	**Institution**
Pricing Tariffs	Direct Load Control; Dynamic Critical Peak Pricing[5]	Time-Variant Rates; Demand Charges	Capacity; Peak load shaving	Utility performance incentives (e.g., Arizona)	LSEs
Permanent Load Shifting		Energy Efficiency	Peak load shaving	Tariff signals	LSEs, Third parties, customers
Rebate Programs	20/20; Alerts	Peak Time Rebates	Peak load shaving	Bid into markets.	LSEs
Technology -Enabled DR Programs	Auto-AC	Tariff-triggered thermostats		Tariff signals; Markets	LSEs, CAISO, Third parties
DR Bundles	DR + Storage			Markets	CPUC
DR Incentive Programs	Capacity Bidding Program; Base Interruptible Program			Markets	CPUC

[5] *See* Heather Sanders, *Wholesale Grid State Indicator to Enable Price Responsive Demand* (June 22, 2012), CAISO, http://www.caiso.com/Documents/WhitePaperProposal-WholesaleGridStateIndicator-EnablePriceResponsiveDemand.pdf.

B. Are there any potential problems or concerns with the proposed bifurcation or realignment of demand response programs into demand-side and supply-side resources? For example, are there any legal issues or other concerns such as missed opportunities for integration?

If the Commission bifurcates DR resources, both demand- and supply-side resources should be linked with commensurate incentives and metrics. Given that the OIR states that "there is no intention to diminish the value of retail demand response,"[6] a bifurcation that tips the incentive scales towards supply-side resources – for example, by exclusively allowing supply-side DR to qualify for resource adequacy ("RA") credits[7], without offering demand-side DR commensurate inducements – could undercut the Commission's overall stated goals and intent.

There should be commensurate inducements and tracking mechanisms in place for resources that are outside CAISO energy market procurement as those that are within this market. Such inducements and mechanisms should allow for both utility and third party access, a goal identified in the OIR.[8] It is important to note that resources inside the CAISO energy market will have double the institutional pressures and incentives – utilities and CAISO – than those outside this market will experience – just the utilities.

DR resources categorized as "demand-side" may be quite effective at minimizing or avoiding entirely future needs for ramping resources. Time-variant rates and tailored DR programs could be used to shift consumption away from what otherwise would be ramping periods, particularly if associated with enabling technology and/or storage.

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[6] DR OIR at 15.
[7] *Id.* at 17.
[8] *See id.* at 16 ("the Commission considers third party demand response providers to be able to provide additional innovation and services to the market, yielding greater demand response potential in California").

From this perspective, the CPUC should develop a least-cost curve of demand- and supply-side resources, and focus on developing the right mechanisms to draw in the most beneficial, cost-effective ones, with more costly measures used to patch any remaining reliability holes. Where possible, markets should be created to harvest these resources in a low transaction cost manner.

EDF recognizes that not every resource should be procured through market mechanisms; at times, specific funding programs are merited. An appropriate mix between market and administrative approaches would align with the OIR's stated goals of enabling DR to "contribute to the efficient use of resources, take[ing] advantage of competitive markets, and be simple to administer."[9]

In this vein it is important to note that price-responsive demand-side DR programs can provide *more* value than central generators because they can be applied – with well-understood and data-informed statistics – homogenously across the grid in ways that enhance power quality. For example, a system in which time-variant rates and other DR programs are reliably attached to enabling technologies and practices could create a better ability to manage power quality than a more expensive set of differently sized generation assets.

C. The OIR describes an ongoing tension between the supply-side and demand-side requirements for demand response. The OIR states that demand response as resource adequacy resources are held to the same requirements as generation resources for system reliability and economic efficiency. Simultaneously, the needs and technical capabilities of customers and providers should also be considered in program design. How could the proposed bifurcation or

[9] *Id.*

realignment of supply-side and demand-side resources be designed to serve both sets of requirements?

EDF is concerned that the "lessons learned" discussion reflected in the OIR may mischaracterize both DR's opportunities and challenges.[10] For example, while DR programs were certainly mis- or underutilized during the summer of 2012, it is not the case that the evidence demonstrates that DR "…is not as reliable and useful as expected." Instead, it may be institutional, programmatic, and/or pricing elements that failed, rather than the underlying category of assets itself.

The CAISO 2012 annual report referenced in the OIR suggests that technical issues, such as the timing of forecast reports from the utilities to CAISO, underlie many of the challenges faced by DR programs.[11] Likewise, a large body of evidence suggests that tariff-based and technology-enabled DR, combined with effective information treatments, can be quite reliable and useful.[12] A variety of end-user devices can be associated with price-responsive demand management, including electric vehicle charging, management of thermal energy storage and air conditioner cycling systems, automated timing of consumer appliance operation, and simple demand reductions during high-priced time periods. Beneficial load management changes can likewise be secured through a host of different incentive structures, such as:

- Time of use rates that are closely matched to general wholesale conditions, enabling participants to save money by reducing their demand during high-price intervals while not having to submit market bids;

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[10] *See, e.g. id.* at 6.
[11] Cal. Indep. Sys. Operator. *2012 Annual Report on Market Issues and Performance*, at 36, http//www.caiso.com/Documents/2012AnnualReportMarketIssue-Performance.pdf.
[12] *See* Environmental Defense Fund, *Residential Rate Design Proposal* (May 29, 2013); *see also* Ahmad Faruqui and Sanem Sergici, *Arcturus: International Evidence on Dynamic Pricing,* (Jul. 1, 2013), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2288116.

- Tariffs that cater to ratepayers who want to be "green" by conserving energy resources at times of shortages or to move their energy consumption to high wind production periods; and
- Aggregated customer groups or resources that are optimized through utility or energy service provider programs for local reliability or economics.[13]

Under current conditions, DR that can have the same megawatt for megawatt reliability effects as generation or that would otherwise be included in the RA process, such as tariffs, but do not currently qualify for RA, receive minimal incentives to be comprehensively activated. For example, low participation rates in the investor-owned utilities' voluntary time-variant residential rate schedules, compared to experience in other states like Arizona suggests that there is insufficient consumer education and outreach and utility incentives to fully utilize this DR resource.[14] Participation could be increased through payment structures that reward utilities based on their success in educating their customers about all of their tariff options, with particular focus on those that offset the need for additional costly generation.

Relatedly, as indicated in the Preferred Resources loading order, fossil fuel generation should be the last in line for dispatch to meet system reliability needs. From that perspective, and given the demonstrable ability for DR resources to reshape load, procurement of additional must-run flexible capacity should be seen as a residual need, after DR has been fully implemented.

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[13] Heather Sanders, *Wholesale Grid State Indicator to Enable Price Responsive Demand* (June 22, 2012), CAISO, http://www.caiso.com/Documents/WhitePaperProposal-WholesaleGridStateIndicator-EnablePriceResponsiveDemand.pdf.

[14] Arizona has a greater than 50% participation in its TOU program. Smart Grid Consumer Collaborative, *Excellence in Consumer Engagement* 25 (Oct. 24, 2011), http://smartgridcc.org/wp-content/uploads/2011/10/SGCC-Excellence-in-Consumer-Engagement.pdf.

The visibility of demand-side resources to CAISO can be enhanced in multiple ways, including more energetic, real-time use of Smartmeter data and better syncing and updating of demand forecasts developed by the CEC. This proceeding and proposed bifurcation should work to remedy these issues, by both ensuring that DR is compensated equally to generation and working to alleviate DR implementation issues that decrease this asset's effectiveness.

In this vein, EDF notes that DR has distinct operating characteristics and opportunity costs as compared with fossil fuel generation. These differences should be taken into account when developing RA requirements, including compensation structures and levels. Although DR services may be delivered under divergent time-related features, overall compensation and requirements should be equivalent among resources.

D. What role, if any, will the load impact protocol serve in this realignment? Are revisions required? Should the Commission develop separate sets of evaluation criteria and/or processes for the demand and supply sides?

Modified load protocols – that measure cost-effectiveness and performance – need to be developed that recognize a broader set of DR, particularly time-variant tariffs, as part of long-term resource planning and adequacy, as well as associated distribution investment planning. For example, tariff-based price elasticities should be included in long-term forecasts used in planning processes, disaggregated to appropriate geographic areas.

Likewise, metrics will be required to measure the performance of the institutional and incentive arrangements developed to draw-in DR, overall DR management structures, and DR's actual performance. This should include the use of Smartmeter data to monitor the load impacts of deployment of different tariffs.

As noted in an early load impact protocol analysis, "[d]ictating the specific methods that must be used for each impact evaluation or ex ante forecast would require an unrealistic level of foresight, not to mention dozens, if not hundreds, of specific requirements. More importantly, it would stifle the flexibility and creativity that is so important to improving the state of the art."[15] From this perspective EDF recommends that the Commission conduct a thorough review of metrics and protocols as part of this OIR to ensure that they are up to date and reflective of existing and emerging conditions.

3. Cost Allocation

A. Current policy requires the utilities to identify, in their demand response applications, the rates used for cost recovery of each program and the justification for that rate. What, if any, additional information should the Commission require to ensure equitable cost allocation and why?

EDF recommends that the Commission pay close attention to investments and expenditures that are not "used and useful." Demonstrating, through thoughtful monitoring and reporting, that investments create the benefit promised by the investor-owned utility ("IOU") should be incented and rewarded. At the same time, expenditures that do not deliver the expected value should be allocated to utility shareholders.

B. If the Commission bifurcates the demand response programs into demand-side and supply-side, does it need to revise its requirements for cost allocation in order to ensure equitable cost allocation? How and why?

DR should be equitably treated, whether it be categorized as supply- or demand-side. If there is a bifurcation, the benefits and costs of demand- and supply-side resources should be separately

[15] *See* California Public Utilities Commission Energy Division, *Load Impact Estimation for Demand Response: Protocols and Regulatory Guidance, Attachment A*, at 7 (Apr. 2008), www.calmac.org/events/FinalDecision_AttachementA.pdf .

tracked, to enable the Commission and stakeholders to examine whether expenditure levels are allocated appropriately.

C. In resource adequacy procurement, costs are allocated across the LSE's. If the Commission bifurcates demand response programs into demand side and supply side, should costs for supply-side procurement be allocated in the same fashion as resource adequacy procurement? If not, recommend other frameworks?

Although EDF recommends that reliability demand and levels, as well as DR investments and expenditures, be tracked by distribution planning level, we also suggest that the three utility service areas be porous in terms of investment decisions and associated cost allocation. That is, if one LSE has a higher-value DR program and population than another LSE, and that program would create benefits across the LSEs, then both entities should be allowed to invest in it, and allocate the associated costs appropriately. Similar to free trade or water markets, this approach would result in lower overall costs via the equimarginal principle.

4. Back-Up Generators[16]

A. If the Commission bifurcates demand response programs, how should the Commission develop rules that are consistent with the D.11-10-003 policy statement?

Although EDF strongly supports D.11-10-003, Conclusion of Law Number 5, we believe that the development of non-fossil fuel back-up "generation" could provide for a "game-changer," both in terms of the utility system and for the owners of these back-up generators ("BUGs"). For example, existing natural gas and diesel BUGs could be replaced as they depreciate or as part of expansions by storage devices, networked into the grid, and provide flexible capacity services. This approach would enable back-up owners to recoup their investment, and, if linked with

[16] EDF did not provide a response to question 3(a), as it does not have data regarding the use of back-up generators.

renewable generation, produce clean energy. It would also help the utilities meet current requirements to rapidly increase storage capacity. EDF proposes that a pilot along these lines be included as part of this OIR.

B. What are the current laws and regulations regarding back-up generation, including those by the Air Resources Board, local air quality management districts and/or any other related regulatory body?

In D.11-10-003, the CPUC determined that "we do not want to allow fossil-fueled emergency back-up generation to receive system or local RA credit as demand response resources…we have consistently stated that demand response programs that rely on using back-up generation were contradictory to our vision for demand response and the Loading Order."[17] This determination applies only to fossil-fueled back-up generation, not clean energy storage or other environmentally benign devices.

EDF's position on BUGs powered by fossil fuels is consistent with restrictions promulgated in California. The California Air Resources Board ("CARB") and local air quality management districts have put restricted stationary diesel back-up generators in a number of ways to avoid their negative effects. In a 2011 regulation, CARB restricted use of diesel in stationary engines, including generators, that have a rated brake horsepower greater than 50.[18]

The South Coast Air Quality Management District ("AQMD") requires a permit for certain emergency BUGs,[19] the Bay Area AQMD requires a permit for diesel generators,[20] the Santa

[17] Oversee the Resource Adequacy Program, Consider Program Refinements, and Establish Annual Local Procurement Obligations, R. 09-10-032 at 26 (issued Oct. 10. 2011) (OIR).
[18] 17 Cal. Code. Regs. § 93115.5.
[19] Internal combustion engines greater than 50 brake horsepower and gas turbines greater than 2,975,000 BTU/hour. South Coast Air Quality Management District, *Fact Sheet on Emergency Back Up Generators*, http://www.aqmd.gov/permit/fact_sheet_emergency_backup_gen.htm#Fact1.
[20] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines,* Rule 4-2,

Barbara Air Pollution Control District ("APCD") mandates that BUGs only be used when absolutely necessary and requires permits for stationary diesel engines 50 horsepower or greater[21], and the Sacramento Metropolitan AQMD limits BUGs to no more than 200 hours per year for non-emergency purposes.[22] In contrast, AQMDs and APCDs do not prohibit the use of clean back-up in support of DR programs.

At the same time, the State has taken clear and positive steps towards achieving greater clean energy storage capacity. In September 2010, the California Legislature enacted AB 2514, which directed the CPUC to create energy storage procurement targets for IOUs and publicly-owned utilities ("POUs").[23] The CPUC filed an OIR in December of that year and set forth a procurement target in a decision that came out last month for Southern California Edison, Pacific Gas & Electric and San Diego Gas & Electric of 1,325 MW by 2020.[24]

In addition, several State agencies have recognized the importance of energy storage: a report prepared for the CEC states that energy storage is relevant to several major action areas, including renewable energy, electricity adequacy, reliability, and infrastructure.[25] Likewise, both the 2009 and 2011 IEPR identify energy storage as an important component of integrating preferred resources,[26] and the Governor's *Clean Energy Jobs Plan* recognizes energy storage's

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http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_Final_May%202012.ashx.

[21] Santa Barbara Air Pollution Control District, *Do You Really Need a Back Up Generator?* http://www.sbcapcd.org/generators.htm.

[22] San Joaquin Air Pollution Control District, Rule 2201.

[23] Cal. Pub. Util. Code § 2835 *et seq.* (West 2013).

[24] Adoption of Procurement Targets for Viable and Cost-Effective Energy Storage Systems, R. 10-12-007 (issued Dec. 21, 2010) (OIR); Adoption of Procurement Targets for Viable and Cost-Effective Energy Storage Systems, R. 10-12-007 (issued Dec. 17, 2013) (OIR, final decision).

[25] Public Interest Energy Research Program, University of California, *2020 Strategic Analysis of Energy Storage in California,* at 71-72 (Nov. 2011), http://www.law.berkeley.edu/files/bccj/CEC-500-2011-047.pdf.

[26] Cal. Energy Commission, *2009 Integrated Energy Policy Report Update*, at 193, http://www.energy.ca.gov/2009publications/CEC-100-2009-003/CEC-100-2009-003-CMF.PDF; Cal. Energy Commission, *2011 Integrated Energy Policy Report Update*, at 39, http://www.energy.ca.gov/2011publications/CEC-100-2011-001/CEC-100-2011-001-CMF.pdf.

role in integrating preferred resources and creating jobs.[27] In this context, deploying storage to replace dirty BUGs while supporting grid reliability through system networks would reflect significant progress toward meeting state energy policy goals.

5. Conclusion

EDF believes that a well-designed DR foundation will support future development, administration, and implementation of DR programs in the State, and thanks the Commission for the opportunity to comment on these foundational questions. Goals laid out in the DR OIR, including creating a "competitive procurement process," ensuring that the "value of retail demand response" is not diminished, and allowing "third party demand response providers to play a much larger role in the procurement of supply-side demand response" will be essential to this end.[28] As such, EDF strongly supports ensuring equity among DR resources and between DR and generation resources.

A number of considerations should be taken into account as part of any Commission decision to bifurcate DR into demand- and supply-side resources. Definitions should not be structured in such a way that barriers to accessing markets are created – thereby undermining demand-side DR's potential. EDF believes that a careful examination of the characteristics of demand- and supply-side resources, matched with possible transition pathways and future regulatory treatment, is merited.

Further, as "fossil-fueled emergency back-up generation resources [are not] allowed as part of a demand response program for resource adequacy purposes,"[29] the Commission should consider opportunities for clean technologies, such as storage, to meet the State's back-up resource needs, both for individual facilities and as contributors to utility wide reliability. EDF's

[27] Governor Edmund Brown, *Clean Energy Jobs Plan*, at 3, http://gov.ca.gov/docs/Clean_Energy_Plan.pdf.
[28] DR OIR at 15-16.
[29] *Id.* at Attachment 1, p.3.

proposed approach could enable back-up owners to recoup their investment, utilities to meet storage capacity requirements, and the State to meet environmental and energy needs.

Respectfully signed and submitted on December 13, 2013.

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