BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Integrate and Refine Procurement Policies and Consider Long-Term Procurement Plans	R.12-03-014 (Filed March 22, 2012)

CALIFORNIA ENVIRONMENTAL JUSTICE ALLIANCE'S COMMENTS RELATED TO THE LOADING ORDER

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The California Environmental Justice Alliance (CEJA) respectfully submits these comments in response to the September 14, 2012 Administrative Law Judge's Ruling Seeking Comment on Workshop Topics. These comments address considerations for ensuring fair evaluation of preferred resources pursuant to California's policies and requirements in response to the questions posed in the September 14, 2012 ALJ Ruling. Although CEJA does not believe that procurement is necessary at this time, if the Commission does authorize procurement, it is imperative that the loading order is followed.

DISCUSSION

Years ago, California set goals to transition its energy generation from an old conventional-grid that relied primarily on fossil fuel generation to a grid that significantly increases and integrates renewable energy and reduces air emissions. To facilitate this transition, California's loading order requires thoughtful consideration of alternatives to reliance on fossil fuel generation such as energy efficiency and demand response. Despite this, the utilities have continued to conduct business in much the same way as they did years ago, continually failing to evaluate resources such as energy efficiency, demand response, and distributed generation as ways to meet unmet needs. This is only inconsistent with the loading order; it is leading California down the wrong path. This proceeding presents the Commission with an important opportunity to change that direction and require compliance with the loading order.

QUESTION 1: *What changes should be made to the rules governing the Investor-owned Utilities (IOUs') procurement process that would allow all resources (natural gas combined cycle, combustion turbine, storage, demand response, combined heat and power, renewable, etc.) to compete fairly in meeting identified needs? Please provide specific proposals for structuring an all-source procurement process.*

RESPONSE TO QUESTION 1: ***Procurement Rules Should Be Changed to Assure a Fair, Competitive Evaluation of Resources Pursuant to the Loading Order to Meet Unmet Needs.***

The Commission should continue to fund preferred resource programs and initiatives separate from the procurement process, as it currently does. After accounting for these programs

and initiatives, if there is a residual need, the Commission should change and amend the procurement process to assure that all resources can be fairly considered pursuant to the loading order. The loading order requires utilities to "invest first in energy efficiency and demand-side resources, followed by renewable resources, and only then in clean conventional electricity supply."[1] The "loading order applies to all utility procurement, even if pre-set targets for certain preferred resources have been achieved."[2] The Commission has further directed that "[t]his approach also continues for each step down the loading order, including renewable and distributed generation."[3]

To assure compliance consistent with the loading order, CEJA recommends that the Commission follow a phased approach and consider preferred resources in order of priority. In addition, consistent with the purposes of the loading order, CEJA recommends that the Commission require explicit consideration of greenhouse gas (GHG) emissions and environmental justice. Finally, due to the potential of the Commission's decision related to application of the loading order to significantly impact the environment, the Commission should perform an environmental analysis to inform its decision.

A. A Phased RFO with a Concrete Marker for Cost-Effectiveness Can Help Ensure Compliance with the Loading Order.

The Commission should require prioritization and thorough consideration of preferred resources. To accomplish this, the Commission could change the procurement design by requiring utilities to conduct a phased request for offers (RFO) process; starting with demand-side resources. After each phase, if there is still a need, then the utility would enter into another phase by moving down the line of preferred resources consistent with the prioritization in the loading order. The first phase of the RFO could evaluate energy efficiency (EE) and demand response (DR) resources side-by-side, with priority given to EE. If demand-side projects do not

[1] Cal. Pub. Util. Code § 454.5
[2] D.12-01-033 at p. 20.
[3] *Id.* at p. 21-22.

fill the need, the next phase could be to evaluate preferred resources including renewable and energy storage[4] resources. Only after considering all preferred resources, if there is still a need, the utility could enter into a final phase and consider offers for fossil-fuel resources. Offers for increasing the capability of existing facilities through upgrades such as software upgrades should be given priority over new fossil-fuel resources.

The key to assuring a fair process in the phased RFO is to have a concrete marker for cost effectiveness. By establishing a concrete marker, utilities would not be able to revert to procuring fossil fuel by merely arguing that the preferred resources are not cost effective. For instance, as a starting point, the California Energy Commission (CEC) estimated the levelized cost for operating peaking facilities to be up to 86 cents/kWh.[5] To develop a cost metric for all the preferred resources, the Commission should also examine the EE proceeding, where the issue of developing an avoided cost metric is being analyzed.[6] Parties to the EE proceeding have stressed the need to develop a cost-effectiveness metric for preferred resources that captures the long-term avoided costs of that resource.[7] Avoided costs should include "non-energy impacts" that reflect various societal benefits.[8] These non-energy impacts include factors such as avoided transmission and distribution costs,[9] and avoided GHG emissions.[10] For instance, DRA notes

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[4] While storage is not an official "preferred resource" under the loading order, the California Legislature and the Commission have recognized the importance of this resource and the Commission could prioritize its procurement by requiring as part of any RFO held as a result of this proceeding. *See* CEJA Ex. 1 (B. Powers Test.) at pp. 16-19.
[5] CEC, Comparative Costs of California Central Station Electricity Generation at p. 3 (2009). This cost is not does not include all the elements that factor into determining avoided cost, so the actual avoided cost should be different.
[6] *See* Administrative Law Judge's Ruling Seeking Post-Workshop Comments on Demand-Side Cost-Effectiveness Issues in R.09-11-014 (Aug. 14, 2012) and comments in response to this ruling dated October 1, 2012.
[7] *See* Opening Comments of NRDC in R.09-11-014 (Oct. 1, 2012); Opening Comments of DRA in R.09-11-014 (Oct. 1, 2012).
[8] *See* Opening Comments of DRA in R.09-11-014 (Oct. 1, 2012) at p. 3.
[9] *See* Opening Comments of DRA in R.09-11-014 at pp. 18-20.
[10] *See* Opening Comments of NRDC in R.09-11-014 at p. 4; *see also* CEJA Track I Ex. 6, Attachment B at pp. 31-33(Ceres Report: Practicing Risk-Aware Electricity Regulation: What Every State Regulatory Needs to Know, How State Regulatory Policies Can Recognize and Address the Risk in Electric Utility (April 2012)) (addressing various risks associated with conventional generation including risks of new regulations, carbon price risk, and water constraint risk among others.).

that in the 2010 LTPP, "the utilities estimated that RPS procurement will have saved over $520 million in GHG compliance costs to ratepayers by 2020."[11]

A cost-effectiveness metric should also consider the extent to which preferred resources, particularly EE, provides societal benefits by avoiding additional ratepayers costs of building expensive new infrastructure.[12] CEJA expert Julia May has provided testimony on the comparatively small-risk investment options provided by EE, particularly when compared to much riskier investments in additional conventional facilities.[13] Ms. May cites to information demonstrating "major losses to investors and ratepayers from planning decisions that do not include sufficient information about economic risk factors, especially for large centralized power plants."[14] Notably, EE has been found to be the "lowest-cost, lowest-risk resource."[15]

In sum, the Commission should develop a cost-effectiveness metric for preferred resources to be evaluated pursuant to the loading order. By considering long-term avoided cost benefits such as GHG and other pollutants emission reductions and the avoidance of expensive investments in transmission and another new costly infrastructure, a cost-effectiveness metric will more realistically reflect the true value of preferred resources. Without analyzing their true value, preferred resources will likely continue to lose out when compared to conventional generation and the utilities will continue to fail in properly applying the loading order.

B. *Greenhouse Gas Emission from the Proposed Resources Should Be Considered As Part of Loading Order Compliance.*

Meeting GHG goals will depend on the application of the loading order. State requirements and policies require the reduction of GHG emissions in California. The Global

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[11] DRA Opening Comments in R.09-11-014 at p. 17.
[12] *See* Opening Comments of NRDC in R.09-11-014 at p. 5 (on discount rates for energy efficiency: "Investments in energy efficiency are inherently less risky and less costly than investments in traditional generation and infrastructure, both for the customer and the utility.").
[13] *See* CEJA Track I Ex. 5 (J. May Reply Test.) at pp. 3-4.
[14] *Id.* at p. 3.
[15] *Id.* at p. 4, citing CEJA Track I Ex. 6, Attachment B (Ceres Report, Practicing Risk-Aware Electricity Regulation: What Every State Regulatory Needs to Know, How State Regulatory Policies Can Recognize and Address the Risk in Electric Utility (April 2012)).

Warming Solutions Act of 2006 (AB 32) mandates a reduction in GHG emissions to 1990 levels by 2020.[16] Further executive goals increase the reduction targets to 80% of 1990 levels by 2050.[17] In a recommendation to the California Air Resources Board (CARB), the Commission and the CEC stressed the importance of EE and renewable energy in reducing GHG emissions.[18] The Commission has further emphasized the central importance of the loading order in implementing the goals of AB 32.[19] The intent of AB 32 is to reduce GHG emissions.[20] The first step indicated by AB 32 in reducing GHG is by "direct emission reduction measures," from sources such as utilities.[21] Further, "the Commission has repeatedly indicated that reduction in GHG emissions is a key policy objective for the utility industry."[22]

Statute requirements are only part of the battle. Although the Commission has stated that utilities should generally "demonstrate how each application for fossil generation comports with these [GHG reduction] goals,"[23] it needs to do more to guarantee accountability. Requiring utilities to report current and future GHG emissions for all energy sources in their territory is a good first step. Long-term GHG emissions should be comprehensively reviewed before new fossil fuel projects are approved. The long-term nature of conventional power plants means that any plans approved now will likely affect GHG emissions for 40 years into the future. These impacts cannot be viewed in a vacuum; they should be compared and added to the total of all current and future direct emissions. These reports can be used by the Commission to determine whether current power generation facilities comply with GHG goals and for planning of future procurement. The Commission should require careful consideration of how additional fossil fuel resources impede on AB 32 goals and ensure the procurement of preferred resources ahead of other resources in meeting any generation needs.

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[16] Cal. Health & Safety Code § 38550 (2006).
[17] Cal. Exec. Order S-3-05.
[18] D.08-10-037 at p. 3, 6.
[19] D.12-04-045, at p. 11.
[20] CARB. "Climate Change Scoping Plan." (Dec. 2008).
[21] Cal. Health & Safety Code § 38561(b).
[22] D.10-12-035 at p. 38, citing D.07-12-052 at pp. 2-5; D.08-10-037 at pp. 2-3.
[23] D.07-12-052 at pp. 3-4.

C. *Environmental Justice Should Be Considered as Part of the RFO Evaluation.*

The Commission should require consideration of environmental justice as part of the procurement process. Environmental justice refers to the disproportionate burden of environmental pollution on low-income and minority communities.[24] Such pollution results from both mobile[25] and stationary sources, which are often concentrated in low-income/minority communities.[26] Increased exposure to fossil fuel emissions in environmental justice communities causes higher rates of related cancers and diseases,[27] particularly among sensitive populations (i.e. pregnant women, children, the elderly, and people with existing respiratory diseases).[28]

Existing policies require consideration of environmental justice in procurement. Commission precedent expressly states that utilities "need to provide greater weight" to criteria regarding "disproportionate resource siting in low-income and minority communities and environmental impacts."[29] In addition, Section 399.13 of the Public Utilities Code which relates to renewable energy procurement, *requires* that utilities "give preference to renewable energy projects that provide environmental and economic benefits" to communities that have high-unemployment rates, are low-income, or that "suffer...high emission levels of toxic air contaminants, criteria air pollutants, and greenhouse gases."[30] This mandate supports the Commission requiring consideration of environmental justice issues in applying the loading order to procurement plans.

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[24] Environmental Justice, CEC, http://www.energy.ca.gov/public_adviser/environmental_justice_faq.html
[25] Environmental Justice Screening Method (EJSM) and Community Participation, Pastor et al. at p. 5, *available at* http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CARE%20Program/Task%20Force%20Meetings/060512%20TF/EJSM%20and%20Community%20Participation.ashx?la=en at p. 11 (*See* Hazardous Land Use slide)
[26] *See* D.07-12-052 at p. 157 (noting that the utilities should give greater weight to the disproportionate resource sites in low income and minority communities)
[27] CEJA Ex. 3 at p. 4(CARB estimates around 10,000 annual premature deaths in CA due to PM2.5 exposure)
[28] Pastor et al., *Playing It Safe: Assessing Cumulative Impact and Social Vulnerability through an Environmental Justice Screening Method in South Coast Air Basin, California*, 8 Int. J. Environ. Res. Public Health, 1441, 1447 n. 5 (2011) (available at www.mdpi.com/1660-4601/8/5/1441).
[29] D.07-12-052 at p. 157.
[30] Cal. Pub. Util. Code § 399.13, *see* subsection (a)(7).

Pursuant to this authority, the Commission should prioritize filling potential need by siting preferred resources in low-income and minority communities. For instance, the Commission could require that a certain percentage of rooftop solar PV is sited in environmental justice communities. To institute this policy, the Commission should require that a certain percentage of renewable resources be located within environmental justice communities; CEJA's recommended amount is 25%. This value is consistent with the recently enacted SB 535, which requires at least 25% of GHG revenues to provide benefits to "disadvantaged communities."[31] The Commission should also require that no more fossil fuel resources are sited in these already overburdened communities because, as the California Legislature recently recognized, these communities "already face disproportionate impacts from substandard air quality in the form of higher rates of respiratory illness, hospitalizations, and premature death."[32]

To identify environmental justice communities, CEJA recommends that the Commission employ the Environmental Justice Screening Method (EJSM).[33] The EJSM is a tool specifically designed for decision-makers to identify "communities of potential regulatory concern" by determining the cumulative impact that multiple hazards and social stressors have on environmental justice communities.[34] The categories of cumulative impacts are: hazard proximity and sensitive land use; health risk and exposure; social and health vulnerability; and climate change vulnerability.[35] These four categories cover more than 23 indicators, which when analyzed together, generate a comprehensive cumulative impact score that effectively identifies potential environmental justice communities.[36] Assessing cumulative impacts is a superior

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[31] *See* SB 535 (approved by Governor on September 30, 2012), http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_0501-0550/sb_535_bill_20120930_chaptered.pdf
[32] *Id.* at Section 1(a).
[33] *See Playing It Safe* at p. 1442.
[34] Environmental Justice Screening Method: Integrating Indicators of Cumulative Impact into Regulatory Decision-Making, Rachel Morello-Frosch, et. al., at p. 26, http://www.epa.gov/ncer/events/calendar/2010/mar17/presentations/sadd.pdf
[35] *Playing It Safe* at p. 1443.
[36] *Id.* at p. 1446; *see also id.* at pp. 1444-1445 (describing indicators).

method to the isolated "chemical-by-chemical" or "facility-by-facility" analyses.[37] CEJA recommends the EJSM as its preferred screening methodology because its design combines multiple types of publicly available data to produce comprehensive results.[38] CEJA urges its use and adoption of the EJSM because it is comprehensive, easy to implement, and developed specifically to aid decision makers in identifying environmental justice communities.

D. *The Commission's Decision Related to the Application of the Loading Order Can Reasonably Be Expected to Cause Significant Effects to the Environment.*

The Commission decision on the application of the loading order to procurement is a project under the California Environmental Quality Act (CEQA) because it will have "a reasonably foreseeable indirect" effect on the environment.[39] CEQA applies to all projects which "may cause a direct physical change to the environment, or a reasonably foreseeable indirect physical change to the environment."[40] "Project" is defined broadly in order to maximize the intent of CEQA, which is protection of the environment.[41] Under CEQA, a project is interpreted to mean much more than just a physical project such as a power plant. Instead, "project" also applies to agency rulemakings and decisions.[42]

For example, a municipality's regulation limiting the use of plastic bags was found to constitute a project under CEQA.[43] In another instance, the adoption of a rule authorizing the paving of desert roads was considered to have a significant effect on the environment because it

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[37] *Id*; *see also* Environmental Justice Screening Method (EJSM) and Community Participation, Pastor et al. at p. 5, *available at* http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CARE%20Program/Task%20Force%20Meetings/060512%20TF/EJSM%20and%20Community%20Participation.ashx?la=en, at p. 25.

[38] *Id.*

[39] California Environmental Quality Act, Cal. Pub. Res. Code § 21065 (1972).

[40] *Id.*

[41] *Center for Sierra Nevada Conservation v. County of El Dorado*, 202 Cal. App. 4th 1156, 1170 (3d Dist., 2012).

[42] *See Cal. Unions for Reliable Energy v. Mojave Desert Air Quality Mgmt. Dist.*, 178 Cal.App.4th 1225, 1240 (2009) ("The adoption of a rule or regulation can be a project under CEQA."); *see also Wildlife Alive v. Chickering* (1976) 18 Cal.3d 190, 206; *Plastic Pipe & Fittings Ass'n. v. Cal. Bldg. Standards Comm.* (2004) 124 Cal.App.4th 1390 (same).

[43] *Save the Plastic Bag Coalition v. City of Manhattan Beach*, 52 Cal. 4th 155 (2011); *see also Muzzy Ranch Co. v. Solano County Airport Land Use Comm'n* 60 Cal.Rptr.3d 247 (2007) (County airport land use commission's adoption of land use compatibility plan was "project" under CEQA).

was "reasonably foreseeable" that the rule would result in road paving.[44] CARB's development of the AB 32 Scoping Plan was also found to constitute a project under CEQA.[45] The Commission's decision regarding loading order compliance is a quasi-legislative administrative action that may have a significant environmental impact.[46] CEQA also requires public agencies to evaluate feasible alternatives or mitigation measures which would "substantially lessen the significant environmental effects" of projects it approves.[47] A significant effect on the environment is "a substantial, or potentially substantial" adverse change in the environment,[48] which is determined by the "fair argument standard."[49] CEQA review should include an analysis of a range of alternatives with varying degrees of environmental impacts.[50]

Here, the Commission is tasked with determining whether there is a need, and if there is, how to ensure compliance with the loading order when filling that need. If the Commission's decision fails to include requirements to ensure loading order compliance, a utility could fill need with only fossil-fuel generation. In contrast, if the Commission directs procurement compliant with the loading order and requires concrete markers to ensure fair consideration of preferred resources, then the need will likely be met through resources that have less or no impact on the environment. This is especially pertinent considering that the Commission has already found that the utilities have historically failed to comply with the loading order.[51] Non-compliance with the loading order can reasonably be expected to cause a significant environmental impact as

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[44] *Cal. Unions for Reliable Energy v. Mojave Desert Air Quality Mgmt. Dist.*, 178 Cal.App.4th at 1231.
[45] *See Ass'n. of Irritated Residents v. Cal. Air Resources Bd.*, 206 Cal.App.4th 1487, 1491 (2012) ("The process for developing and approving the scoping plan in compliance with the statutory mandate was extensive and rigorous. . . [including] certain steps to finalize the plan and the functional equivalent document (FED) prepared to comply with the California Environmental Quality Act (CEQA).").
[46] *See id.* at p. 1494 ("The parties agree that the adoption of the scoping plan is properly characterized as quasi-legislative administrative action. Statutory provisions directing [an agency] to develop and prepare a ... plan and progress report are within the category of quasi-legislative acts.") (internal citations omitted); *see also Carrancho v. California Air Resources Board* (2003) 111 Cal.App.4th 1255, 1266.
[47] Cal. Pub. Res. Code § 21002.
[48] Cal. Pub. Res. Code § 21068.
[49] *Azusa Land Reclamation Co. v. Main San Gabriel Basin Watermater*, 52 Cal. App. 4th 1165, 1202 (2d Dist. 1997); *see also* 14 C.C.R. § 15064(f)(1) (1997); *No Oil, Inc. v. City of Los Angeles*, 13 Cal. 3d 68, 75 (1974).
[50] *See, e.g., Ass'n. of Irritated Residents v. Cal. Air Resources Bd.*, 206 Cal.App.4th 1487, 1492-93 (2012).
[51] *See* D.07-12-052 at pp. 3-4; D.12-01-022 at p. 21.

new conventional resources are likely to be built. Recent values from a natural gas plant demonstrate that new conventional generation will emit significant amounts of CO_2 and other GHGs, including nitrous oxide and PM 2.5.[52] In contrast, preferred resources generally emit little to no GHGs or other pollutants.[53] Energy efficiency and demand response emit no GHGs, while renewable resources such as solar PV and wind energy emit only minimal operational GHGs.[54] SCE itself has acknowledged that this is one major benefit of preferred resources.[55]

To illustrate this, the table below shows a comparison is made by quantifying and conceptualizing environmental impacts of different resources with direct air emissions of CO_2, NO_x, and $PM_{2.5}$ per 100 MW of energy capacity, as well as a discussion of CO_2 equivalent indirect air emissions.

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[52] Marsh Landing Generating Station: Commission Decisions, California Energy Commission, at pp. 35, 37, 47 (Aug. 2010) http://www.energy.ca.gov/2010publications/CEC-800-2010-017/CEC-800-2010-017-CMF.PDF. The CEC found that Marsh Landing can be expected to produce a maximum of 756,981 MTCO2E annually. The CEC also found that NOx, VOC, and PM10 and 2.5 emissions would contribute to existing violations of state and federal air quality standards.

[53] Tr. 633: 18-21 (Cushnie, SCE). ("Clearly that's one of the benefits of preferred resources is that they don't have a GHG emissions profile.")

[54] *See Id.* (preferred resources have no associated GHG emissions).

[55] *Id.*

TABLE: Annual air emissions per 100 MW of the following sources:

	Nat. Gas fired power plant[56]	Demand Response	Energy Efficiency	Solar PV	Energy Storage
Direct Emissions (during use of power source)					
CO2 equivalent (metric tons/yr)	**300,000 Continual** Best case - New CC (Peakers & existing average plants would have much higher emissions)	**Likely 0 -** Savings depend on energy later used; allows delay to clean offpeak source, avoids peakers. Peak shaving can cut out new gas build need.	**0** (+Peak shaving can cut out new gas build need, avoid peakers.)	**0** (+Peak shaving can cut out new gas build need & avoid peakers.)	**Likely 0 -** Savings depend on source stored; effective at maximizing use of clean intermittents, when most needed
NOx lbs/yr	**31,600**	**Likely 0 - "**	**0**	**0**	**Likely 0 - "**
PM2.5 lbs/yr	**20,400**	**Likely 0 - "**	**0**	**0**	**Likely 0 - "**
Indirect Emissions (during fuel prod., manufacture of devices, construction, etc. before use of power source)					
CO2e (metric tons/yr)	**Ongoing**:[57] Fracked gas production.: **≈488,000-999,000** Conventional gas: **≈240,000-750,000**	**Probably Zero** (No different activities, just at different time)	**Onetime**: Varies by type - mfgr /constr. of new appliance, building improvment, etc.	**Onetime**:[58], Mfr: **775** (**3,880** if use 20% capac.) Materials:[59] Payback 4yrs	**Onetime**: Varies by type - mfgr / constr. – batteries, flywheels, stored water, etc.

[56]Using new, unbuilt 624MW Oakley plant rates as example. Oakley Generating Station Commission Decision, CEC-800-2011-002-CMF (May, 2011). Calculating CO2, NOx, and PM2.5 at example Oakley Heat emission rates, per 100 MW -- CO2: CEC final decision gives 1,873,220 MTCO2e/yr for CC (Combined Cycle) combustion turbine generators, (GHG section p. 8, 159th page of pdf) excluding other project equipment, or ≈300,000 MTCO2e/yr per 100 MW. NOx: 98.6 tons/year - NOx emissions for combustion turbine generators, reported for Oakley's 624 MW, =15.8 tpy per 100 MW, or ≈31,600 lbs, (Air Quality section p. 16, 183rd page of pdf), PM2.5: 63.7 tpy = 10.2 tpy per 100 MW or ≈20,400 lbs, same page.

[57] Emissions from natural gas production: ≈22-45 g C /MJ for shale gas 20-year timeframe chart, p. 1, conventional gas ranged from ½ fracked gas low to ¾ fracked gas high.R.W. Howarth, D. R. Atkinson, Assessment of the Greenhouse Gas Footprint of Natural Gas from Shale Formations Obtained by High-Volume, Slick-Water Hydraulic Fracturing, Cornell University, (*Rev. April 11, 2011*), http://www.eeb.cornell.edu/howarth/Marcellus.html. See calculations in endnote for conversion, using Oakley rates as example. Calculations converting previously cited Cornell study's indirect gas production emissions for shale gas is 22-45 g C/MJ to tons/yr using the example rates of gas input and MWHh/yr at Oakley power plant: Oakley heat rate input is 6,779 Btu/kWhr natural gas (GHG section p. 10, pdf 161st), annual energy output is 5,281,000 MWhr/yr (GHG section p. 8). Using Oakley's rates in example: 6,779 Btu/kWhr = 6,779,000 BTU/MWh=6.8 megaBTU/MWhr, x 5.28 $x10^6$ MWhr/yr = $35.8x10^6$ megaBTU/yr x 1055 megaJ/ megaBTU = 37.8 $x10^9$ MJ/yr. Fracked natural gas at this rate, low emissions range: 22 grams carbon /MJ x (44/12 gCO2/gC) = 80.67 g CO2/MJ x 1 metric ton/million g x 37.8 $x10^9$ MJ/yr = 3.05 million metric tons CO2/yr (for 624 MW)/6.24 = 488,000 metric tons CO2/yr per 100 MW. For high end = 488,000 x 45high/22low = 999,000 MT high.

[58] First Solar PV Example: Reported manufacturing emissions of 194 MtCO2e / MW of modules produced (Oct 13, 2011 Business Wire report from Carbon Disclosure Project for First Solar, see calculations for table above in endnote. http://www.solarpowerfollower.com/solar-power/first-solar-measures-and-reports-its/). 194 MtCO2e / MW of modules produced =19,400 MTCO2e per 100MW for 25+year product life, or ≈775 MTCO2e /yr for 100 MW. If solar is discounted by a 20% capacity annual factor to compare to 100% natural gas, this compares to about 3880 MTCO2e/yr for 100 MW.

[59] A study reviewed ranging literature assumptions on PV Life Cycle; concluded likely energy payback of typical domestic rooftop grid-connected PV cell is ≈4 years: Energy Payback of Roof Mounted Photovoltaic Cells, Energy Bulletin, 06/16/2006, Original article: Colin Bankier and Steve Gale (Jun 16 2006). http://www.energybulletin.net/stories/2006-06-16/energy-payback-roof-mounted-photovoltaic-cells.

The analysis shows EE and solar PV cause zero direct air emissions, while natural gas causes high direct combustion emissions. NO_x and $PM_{2.5}$ are included to emphasize that given California's high asthma rates, local lung health should be the highest priority. Less apparent is that the biggest emissions are the high indirect emissions due to leaking of methane during natural gas production (drilling, fracking, etc.). This is a continuous impact due to the fuel requirements of operating natural gas facilities.[60] California obtains most of its natural gas from out of state,[61] where fracking has drastically expanded in recent years. In comparison, preferred resources have some indirect, one-time emissions[62] that are drastically lower than the direct or indirect emissions from natural gas.

Finally, because no other agency has made, or will make, a determination about how to apply the loading order to utility procurement, the Commission is the lead agency that has the responsibility to conduct the requisite CEQA analysis.[63] For instance, the Commission decided to not perform a CEQA analysis when it approved the proposed settlement regarding GHG emission offsets in the 2010 LTPP rulemaking because CARB had already done their own analysis.[64] Yet, in the same proceeding, the Commission admitted "[u]nder normal responsible agency practice, this Commission would have to review the entire ... program."[65] In the present case, no other agency has jurisdiction over how the loading order applies because only the Commission governs rulemaking proceedings regarding utility procurement.

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[60] This turns out to be even higher than the substantial direct combustion emissions from burning natural gas at the power plant, although the table below used the best-case example for a natural gas plant (a new combined cycle power plant, using Oakley Generating Station rates as an example). If instead a new peaker or existing plant were analyzed, direct emissions would be much higher.

[61] CEC Energy Almanac, 2010, California Natural Gas Sources from: Southwest 42%, Rockies 23%, Canada 22%, In-State 12%, http://energyalmanac.ca.gov/overview/energy_sources.html.

[62] Solar PV Panel life cycle analyses have put further scrutiny on manufacturing energy use and have resulted, for example, in eliminating aluminum frames. Panel lifetime is reported at 25+ years, with energy use payback reported in four. The same is true for the indirect emissions of EE and energy storage – direct emissions are zero and there are indirect emissions, but they are one-time costs from manufacturing or construction. Any device requires materials and energy during construction resulting in indirect emissions; this varies depending on the device. These are likely far lower than emissions due to natural gas production and combustion in electric power plants. The table addresses lower solar net annual capacity through an example 20% discount, although this undervalues the strong peak-matching capability of solar, when solar capacity is more in the range of 60%.

[63] *See* Cal. Pub. Res. Code § 21067 (defining lead agency).

[64] D.12-04-046 at pp. 45-46.

[65] *Id.* at p.26.

QUESTION 2: *What amendments, if any, would be necessary to the most recent long-term Request for Offers issued by PG&E, SDG&E, and SCE to ensure that all resources are eligible to compete in meeting future RFO? Are there any changes specific to meeting LCR?*

RESPONSE TO QUESTION 2: To assure compliance with Commission's loading order, preferred resources need to be able to compete and be considered in procurement requests. The Commission has previously evaluated metrics to assure fair consideration of bids in competitive RFOs.[66] In the 2010 LTPP, the Commission evaluated the metrics for considering utility-owned generation relative to generation owned by independent generators.[67] Without metrics that put the alternative resources on the same playing field as conventional generation, it is highly unlikely that alternative resources will be fairly or fully evaluated. However, as RFOs are currently framed with properties that relate specifically to natural gas facilities, other resources are at an inherent disadvantage. Other resources such as EE do not have a ramp rate or specified "output" and cycling levels like natural gas facilities. Rather EE is a reduction of total load, and the properties are defined differently. Renewable energy and distributed generation resources similarly are not defined in the same parameters as natural gas facilities. Specifications that are tailored to conventional generation do not allow other resources to fairly compete in RFOs.

The Commission should require that resource needs are defined only as specific energy requirements in technology neutral terms. If energy is needed for only a few of the top peak hours, the solicitation should include this specification in its RFO. Resources like demand response are very effective at reducing peak, so by requiring more specificity in RFOs, it is more likely other resources will be able to meet the needs. In addition, there should be a recognition that resources do not need to meet all identified characteristics to meet some of the need. A portfolio of resources can be a very effective way to meet demand. For example, energy storage paired with solar PV can be an effective way to provide both ramping and peak needs.

Other areas of the country have taken steps to allow demand-side resources, such as energy efficiency, to compete directly with electric power plants. For example, PJM

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[66] D.12-01-033 at p. 20.
[67] D.12-04-046 at pp. 29-31.

Interconnection and New England ISO have begun holding auctions where demand-side resources compete directly with conventional generation.[68] These auctions have been cited as reducing "the costs of meeting the region's resource adequacy requirements."[69] CEJA urges the Commission to take steps to ensure that all resources receive a fair consideration in the RFO process, if it finds that any procurement is necessary.

QUESTION 3: *What specific characteristics or attributes must any resource -- including demand-side, energy storage, or distributed -- provide in order to meet future procurement needs? In the absence of a Net Qualifying Capacity, what methodology should be used to determine a proxy capacity value for resources lacking a Net Qualifying Capacity for use in LCR capacity accounting? How can these characteristics or criteria be turned into criteria to evaluate resources bid into a Request for Offers to meet LCR or other needs? How should those criteria be weighted?*

RESPONSE TO QUESTION 3: It is unclear what characteristics would be needed for potential future procurement.[70] If the Commission determines that there are specific needs to be met, it should not require resources to meet every attribute it identifies as needed since many different types of resources can meet future needs. Resources should be evaluated for the characteristics that they do bring to the grid. Notably, procurement has not been previously equated with flexible capacity.[71] For instance, EE resources have historically been considered as load modifiers and should continue to be. In addition, many other resources, such as solar PV, would be effective in reducing peak need. On hot summer days in particular, solar PV is highly effective at generating energy during peak times. In fact, solar PV has been found to be approximately 96% available during the top peak hours in the LA Basin.[72] Importantly,

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[68] J. May Supplemental Test., Attach J at p. 3 (*The Role of Forward Capacity Markets in Increasing Demand-Side and Other Low-Carbon Resources, The Regulatory Assistance Project (*May 2010)) ("Two organized markets in the US — PJM and ISO New England (ISO-NE) — now conduct forward capacity auctions that permit a wide range of demand-side resources to compete with supply-side resources in meeting the resource adequacy requirements of the region. The response of demand-side resources in the PJM and ISO-NE auctions is impressive and their participation is clearly demonstrating that reducing consumer demand for electricity is functionally equivalent to — and cheaper than — producing power from generating resources.").

[69] *Id.* at p. 19; *see also* J. May Supplemental Test., Attach K at p. 8 (*Selling Energy Efficiency as a Resource*, Lisa V. Wood, Electric Perspectives, (May/June 2009)).

[70] As described at length in CEJA's Opening Track I Brief, CEJA does not believe there is any need for LCR procurement at this time.

[71] *See* D.09-06-028 (establishing local capacity procurement obligations and not including any flexibility requirements).

[72] CEJA Track I Ex. 1 (B. Powers Test.) at pp. 22-23.

procuring inflexible resources can free up room for flexible resources. In addition, transmission technologies should be explored to enable preferred resources to better meet any perceived need. For instance, synchronous condensers provide both voltage support and inertia to the system.[73] This potential technology and its attributes should be considered a resource. Resources that provide some necessary attributes should be evaluated for their contribution to the grid.

QUESTION 4: *What are the pros and cons of the following procurement methods with regard to: 1) local procurement considered in Track 1 of LTPP, and 2) operational flexibility and general system procurement considered in Track 2 of LTPP?*

A. Continuation of current practices for procurement with minor clarifications;

As SCE admitted during the recent evidentiary hearing, preferred resources do not win RFOs as they are currently designed.[74] Although the Commission has attempted to require compliance with the loading order requirements during procurement, it has not happened. For instance, in the 2006 LTPP, the Commission found that "[g]oing forward the utilities will be required to reflect in the design of their requests for offers ["RFO"] compliance with the preferred resource loading order and with GHG reductions goals and demonstrate how each application for fossil generation comports with these goals."[75] Looking forward, the Commission held that subsequent LTPP filings for all "regulated utilities not only conform to the energy and environmental policies in place, but aim for even higher levels of performance."[76] Despite these statements, preferred resources have not been fairly considered during the procurement process for meeting unmet needs. Unless something changes, procurement processes will not be effective for implementing the loading order. CEJA thus strongly urges the Commission to change procurement methods as current practices have not worked.

B. SCE provided two proposed alternatives to filling any LCR need at the September 7, 2012 workshop, one with flexibility for SCE in procuring resources via two separate tracks, and another

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[73] Track I Tr. 360:11-19 (Millar, CAISO).
[74] Tr. 629: 6-9 (Cushnie, SCE). SCE also has stated that an all source RFO would be counterproductive where certain preferred resources would not fit specific requirements generally associated with conventional generation. *See* Tr. 609: 8-14 (Cushnie, SCE).
[75] D.07-12-052 at pp. 3-4.
[76] *Id.* at p. 4.

approach using an all-source RFO. Is there some way to blend these approaches? If so, how, and should the Commission attempt to do so?

CEJA does not recommend SCE's approach.[77] Rather, CEJA recommends that the Commission require utilities to conduct a phased RFO that separately considers each preferred resource, consistent with the loading order. As discussed above, an essential component to a phased approach is the development of a concrete measure of cost effectiveness to ensure that preferred resources receive fair consideration in the procurement process.[78]

C. Establishing a set of minimum criteria for operational flexibility characteristics for all acquired resources;

As discussed above, the grid needs several different types of characteristics with various attributes. Narrowly limiting procurement to only one definition will not allow other resources to compete even though they could provide beneficial attributes to the grid.

D. A "strong showing" requirement that the utility must demonstrate that its procurement process was substantially open to all resource types and appropriately considered all of the values discussed above and that the resulting portfolio of resources is an optimal solution.

It is unclear how a "strong showing" requirement by itself would lead to compliance with the loading order. The Commission has already stated on previous occasions that the utilities need to meet higher standards for procurement.[79] Yet, the utilities have continued to not fairly consider preferred resources in meeting need.[80] To assure that utilities do implement the loading order, CEJA has recommended a phased approach. In addition, CEJA recommends that the Commission require utilities to document compliance with the loading order with a common template. A common template would allow for greater accountability and transparency.

E. Adjusting existing procurement mechanisms, such as the Renewable Auction Mechanism, to focus on the physical locations with needs that can be met by that programmatic resource.

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[77] As discussed in CEJA's Track I Opening Brief, SCE's proposal has numerous flaws including the fact that it appears to not consider preferred resources before conventional generation, does not use a public process, and relies on procurement processes that even it admits have not allowed for fair consideration of preferred resources. CEJA Opening Br. at pp. 41-43.

[78] *See supra* at Question 1, Section A.

[79] D.07-12-052 at p. 4.

[80] *See id.* at pp. 3-4; D.12-01-022 at p. 21.

CEJA believes that the renewable auction mechanism and the Re-MAT, as discussed by the Community Environmental Council in its October 5, 2012 comments, are tools that the Commission could use to procure preferred resources in specific location.

QUESTION 5: *At the September 7th workshop, some parties discussed retrofits to existing generation assets as a potential source of incremental capacity. What, if any, changes would need to be made to the most recent long term RFO issued by PG&E, SDG&E, and SCE to allow for incremental capacity associated with retrofits to existing generation to compete to meet Local Capacity Requirements? Are there any differences in payment streams that should be given for existing capacity, as opposed to upgraded capacity?*

RESPONSE TO QUESTION 5: Existing resources are a potential source of incremental flexibility that should be allowed to bid into a RFO process. For currently existing facilities, software upgrades, such as OpFlex, are currently being used to allow for faster startup and increased ramping capability.[81] Facilities have seen substantial benefits by employing OpFlex[82] and Fast Cycle technology.[83] This technology can be installed through relatively minor modifications, making upgrades more cost-effective than building a new facility. [84] The RFO process should be designed to allow increases in flexibility from existing resources to be fairly considered and evaluated as an alternative to new generation.

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[81] *See* GE Ecomagination: OpFlex Turndown Technology, http://ge.ecomagination.com/products/opflex-turndown.html; *see also* Siemens, Integrated Technologies that Enhance Power Plant Operating Flexibility, http://www.energy.siemens.com/co/pool/hq/energy-topics/pdfs/en/combined-cycle-power-plants/PowerGen2007PaperFinal_.pdf.

[82] *See Best Practices Awards*, COMBINED CYCLE JOURNAL, at pp. 14, 16 (2008), http://www.combinedcyclejournal.com/1Q2008/1Q2008-1/108Award-p.3-27.pdf.

[83] *See generally* Siemens, *Integrated Technologies that Enhance Power Plant Operating Flexibility*, http://www.energy.siemens.com/co/pool/hq/energy-topics/pdfs/en/combined-cycle-power-plants/PowerGen2007PaperFinal_.pdf; Siemens AG, *Improvement of Operational Efficiency Based on Fast Startup Plant Concepts*, at p. 4 (Sept. 12-16, 2010). http://www.worldenergy.org/documents/congresspapers/455.pdf.

[84] *See* Letter from Paul C. Richins, Jr., Environmental Protection Office Manager, California Energy Commission, to Jack P. Broadbent, Bay Area Air Quality Management District, at p. 2 (May 29, 2007), http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/2007-05-31_LTR_BROADBENT.PDF.

QUESTION 6: *How could a demand-side program be authorized through this LCR procurement process that delivers an on-line date and a duration that is comparable to conventional generation? What additional values are currently attributed to demand response resources in other markets that are currently not accounted for in California, and that might be taken into account as part of an LCR procurement process?*

RESPONSE TO QUESTION 6: Demand response (DR) will continue to be available due to the continued investments in these resources and smart grid infrastructure. The key to ensuring that DR is available in the long-term is to continuing to invest in it. A 2010 report by Lawrence Berkley National Laboratory summarized the expected evolution of DR:

> In 5 to 10 years, demand response potentially could look much different from both the customer's perspective and the utility's perspective compared with today, given advances in enabling technology, metering, and communications. As demand response-enabling technologies (control and communication systems) and price information become more sophisticated and widely accessible, customers should realize direct benefits, and their perceptions of demand response should shift from the belief that demand response involves extra effort and sacrifice to the realization that it is discretionary and easy for chosen applications. Moreover, as energy-using devices become more efficient and easier to monitor and control, and as real-time energy information becomes more accessible, there will be less of a distinction between energy efficiency and demand response. In a few years, customers may be able to manage their energy use without caring whether their energy management falls under an "energy efficiency" or "demand response" label.[85]

This type of evolution in demand response resources is likely to happen in California given the significant investments that the state has made in smart meters and infrastructure. The key to ensuring DR resources are available is assuring that funds are there to pay for reductions in energy usage. To best implement DR, it needs to be evaluated in the procurement process as a resource that can meet potential needs and offset the need for other generation.

CONCLUSION

CEJA appreciates the opportunity to submit comments on the implementation of the loading order.

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[85] C. Goldman, et. al, Lawrence Berkeley National Laboratory, Coordination of Energy Efficiency and Demand Response, at p. 7-1 (January 2010), http://eetd.lbl.gov/ea/ems/reports/lbnl-3044e.pdf.

Respectfully submitted,

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