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Via email

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Re: Informal Comments of Sierra Club, Central California Asthma Collaborative, and California Environmental Justice Alliance on Assigned Commissioner's Office Draft Straw Proposal for Pilots Targeting Demand Response to Benefit Disadvantaged Communities

As the Assigned Commissioner's Straw Proposal recognizes, "[l]everaging demand response resources specifically to benefit disadvantaged communities is a new concept for this decades-old clean resource."[1] Sierra Club, Central California Asthma Collaborative, and California Environmental Justice Alliance strongly agree with the Assigned Commissioner that demand response ("DR") can improve public health and economic opportunity in disadvantaged communities ("DACs") by reducing pollution from natural gas plants sited in DACs and providing direct economic benefits to participants. To promote these shared objectives, we offer the following comments in response to the Administrative Law Judge's questions on the Straw Proposal.

Response to Questions

1. **<u>Regarding the draft Straw Proposal</u>:**
   - **Would you change the environmental and economic goals, the system and local objectives, or the definition of disadvantaged communities? If so, please describe and explain.**

The Straw Proposal introduces valuable goals for the pilot projects, which we recommend the California Public Utilities Commission ("Commission") frame slightly

[1] A.17-01-012, Assigned Commissioner's Office Draft Straw Proposal for Pilots Targeting Demand Response to Benefit Disadvantaged Communities, p. 1 (Feb. 7, 2018) ("Straw Proposal").

differently. By distinguishing between "environmental" and "economic" goals, the proposal may accidentally imply that the pollution-reduction goals themselves do not have significant economic consequences for DACs. However, DR and other clean energy policies have the potential to reduce pollution that imposes an enormous economic burden on DACs.[2] Therefore, it may be more appropriate to categorize the different goals for the pilots as participation incentives and environmental/public health benefits.

We strongly support both sets of goals, for the reasons set forth below.

Participation incentives. A critical component of California's transition to a cleaner energy future is ensuring that parts of the population are not left behind. Climate change will hit DACs first and worst,[3] and yet these communities are also the least likely to benefit from California's transition to a clean energy future. "This 'climate gap' is of special concern for California, home of one of the most ethnically and economically diverse populations in the country."[4] The Commission must ensure that DACs are not left behind in the transition by, in particular, ensuring that clean energy solutions remain both available *and* affordable.

Environmental/public health benefits. Air pollution can cause many serious health effects. Inhaling small particles called fine particulate matter or $PM_{2.5}$ can lead to asthma attacks, hospitalization for worsened heart disease, and premature death.[5] Exposure to ground level

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[2] *See* U.S. Environmental Protection Agency ("EPA"), *EPA's Air Quality Standards for Ground-Level Ozone: By the Numbers*, p. 2, https://www.epa.gov/sites/production/files/2015-10/documents/20151001_bynumbers.pdf ("Meeting a 70 ppb [ozone] standard after 2025 in California will yield annual health benefits of $1.2 to 2.1 billion.").

[3] *See, e.g.*, Rachel Morello-Frosch, et al., *The Climate Gap*, p. 7, https://dornsife.usc.edu/assets/sites/242/docs/The_Climate_Gap_Full_Report_FINAL.pdf (discussing how DACs will suffer more from the impacts of climate change) ("The Climate Gap"). The key finding of this report is: "There is a climate gap. The health consequences of climate change will harm all Americans—but the poor and people of color will be hit the worst."

[4] *See* The Climate Gap, p. 5.

[5] Cal. OEHHA, *Health Studies of Criteria Air Pollutants* (last visited October 4, 2017), https://oehha.ca.gov/air/health-studies-criteria-air-pollutants ("Health Studies of Criteria Air Pollutants"). "Impacts on health have been observed within hours or days of exposure, but chronic exposure impacts have also been seen for a number of endpoints." *Id*. *See also* U.S. EPA, *Health and Environmental Effects of Particulate Matter (PM),*

ozone, which is created by chemical reactions between NO_x and volatile organic compounds in sunlight, can reduce lung function and harm lung tissue.[6] Children, older adults, and people with asthma are at greater risk of these health impacts.[7]

Residents of some California regions breathe some of the most polluted air in the country, especially in relation to ground-level ozone and particulate matter.[8] The American Lung Association's State of the Air 2017 report found that "Los Angeles remains the city with the worst ozone pollution . . . Bakersfield, CA, maintains its rank as the city with the worst short-term particle pollution, while Visalia-Porterville-Hanford, CA, . . . rank[s] as the most-polluted city for year-round particle pollution."[9] In fact, eight of the top ten worst cities for ozone, seven of the top ten worst cities for year-round particle pollution, and six of the top ten worst cities for short-term particle pollution are in California.[10] No other state has as many highly polluted cities.

The operation of natural gas power plants can significantly impact these pollution levels. Natural gas power plants emit $PM_{2.5}$ and NO_x, and the operation of one power plant can significantly impact ambient air emissions. For example, air quality modeling for the Pio Pico Power Plant finds that on "poor air quality days, plant emissions could increase local ambient 24-hour PM_{10} concentrations from a historic maximum background level of 14% above the

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https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm ("Health and Environmental Effects of PM").

[6] Health Studies of Criteria Air Pollutants; U.S. EPA, *Health Effects of Ozone Pollution*, https://www.epa.gov/ozone-pollution/health-effects-ozone-pollution ("Health Effects of Ozone Pollution").

[7] *See, e.g.*, Health Effects of Ozone Pollution; Health and Environmental Effects of PM.

[8] This discussion focuses primarily on $PM_{2.5}$ and NO_x because those are the pollutants that were estimated by the Commission in the RESOLVE modeling runs. Under SB 350, the air pollutants that are required to be minimized are not limited to $PM_{2.5}$ and NO_x. Cal. Pub. Util. Code § 454.52(a)(1)(H).

[9] American Lung Association, *State of the Air 2017 (Key Findings – Overview)*, http://www.lung.org/our-initiatives/healthy-air/sota/key-findings/.

[10] American Lung Association, *State of the Air 2017 (City Rankings – Most Polluted Cities)*, http://www.lung.org/our-initiatives/healthy-air/sota/city-rankings/most-polluted-cities.html.

'healthy' standard to 18% above this standard."[11] In addition, "Pio Pico emissions alone could push 1-h concentrations of NO_2 from 45% to 85% of state standards."[12] The emissions of this one facility could significantly increase the pollution burden in the surrounding majority Latino community.

Power plants' impacts could become more acute moving forward due to increased emissions from units starting, stopping, and operating at partial load. Units that are spinning and operating at partial load generally emit more pollutants per megawatt hour than units operating at full capacity. In the California Independent System Operator's ("CAISO's") SB 350 Study, Aspen Consulting summarized differences between NO_x startup and steady-state emissions for some facilities. Some of that information is excerpted below:

Table 1: NO_x Startup Emissions from Select Facilities[13]

Examples of NO_x Limits	Location or Citation	Cumulative Startup Emissions (lb per event)	Full-Load Steady State (lb NO_x/hr)	Startup Ratio (start/steady state hour)
Colusa 657 MW CC	Colusa Co APCD	260 to 779	20.7	12.6 to 38
Gateway 530 MW CC	BAAQMD	189 to 452	20	9.5 to 23
La Paloma 1048 MW CC	SJVAPCD	1200	69.2	17.3
Lodi Energy Center 294 MW CC	SJVAPCD	160	15.5	10.3
TID Almond2 3 x 58 MW aero-CTG	SJVAPCD	25	5.02	5.0

[11] Elena Krieger, et al., *A Framework for Siting and Dispatch of Emerging Energy Resources to Realize Environmental and Health Benefits: Case Study on Peaker Power Plant Displacement*, ENERGY POLICY 96 (2016), pp. 302-313.
[12] *Id*.
[13] Brewster Birdsall, et al., *Senate Bill 350 Study, Volume IX: Environmental Study*, Aspen Environmental Group on behalf of CAISO ("CAISO SB 350 Study"), Table 4.4-3, p. 100, https://www.caiso.com/Documents/SB350Study-Volume9EnvironmentalStudy.pdf.

As shown by Table 1, just one start of the Colusa facility can emit as many NO_x emissions as the facility would have emitted in 12 to 38 hours of steady-state operation. The values vary significantly among facilities, from a startup producing as many NO_x emissions as five hours of steady-state operation to producing emissions equal to 38 hours of steady-state operation. These values demonstrate the significance of startup emissions and why DR resources must maximize the benefit to DACs by minimizing these cycling needs. As the state increases its reliance on renewables, facilities could be called upon to start and stop several times a day if the Commission does not plan carefully. Frequent startups and shutdowns would increase emissions and should be avoided to the furthest extent possible.

In addition to increased emissions from startups and shutdowns, natural gas facilities also emit more when operating at partial load. CAISO's SB 350 Study found that during partial load NO_x emissions increase by around 30% as compared to steady-state operation.[14]

Moreover, concurrent consideration of environmental and economic benefits is consistent with the Public Utilities Code. Several sections of the Public Utilities Code require the Commission to examine air quality when considering procurement. As the Straw Proposal recognizes, Section 454.52(a)(1)(H) of the Public Utilities Code requires integrated resource planning efforts to "[m]inimize localized air pollutants and other greenhouse gas emissions, with early priority on disadvantaged communities." These pilots should help the Commission implement this mandate; the pilots should provide insights into how the planning process can scale up DR to minimize pollution in DACs.

Other sections of SB 350 further require the Commission to consider the air quality impacts of procurement. In particular, Section 400(b) requires consideration of opportunities to use "technologies with zero or lowest feasible emissions of greenhouse gases, criteria pollutants,

[14] CAISO SB 350 Study, p. 99 (citing NREL).

and toxic air contaminants."[15] Section 400(c) further requires, where feasible, procurement of resources for grid reliability services that have "zero or lowest feasible emissions of greenhouse gases, criteria pollutants, and toxic air contaminants."[16]

- **What would you propose for pilots targeting disadvantaged communities?**

Regardless of the strategy in any particular pilot, a DR pilot targeting DACs should meet a few basic needs. First, they should limit the use of cycling and polluting resources in DACs.

Second, participation must be affordable for the DAC the pilot is intended to serve. In that respect, the pilot must consider future events, such as the impending implementation of Time-of-Use ("TOU") rates and the associated impact on DACs' energy bills. A well-designed pilot targeting DACs should be easily replicable.

Third, culturally sensitive, community-specific marketing is key to the success of the pilots. In its SB 350 Low-Income Barriers Study, the California Energy Commission ("CEC") discovered that "[i]nsufficient outreach and education are critical barriers to expanding energy efficiency and renewable energy resources in disadvantaged communities."[17] The CEC also found that its outreach to DACs "provided an opportunity for community members to speak about experiences with renewable energy, energy efficiency, and weatherization programs."[18] The CEC further found that its outreach provided "crucial insights, such as grassroots desire to participate in community solar projects, potential participants' interest in energy upgrades for the related non-energy benefits, and a degree of skepticism toward government action and program offers."[19]

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[15] Cal. Pub. Util. Code § 400(b).
[16] Cal. Pub. Util. Code § 400(c).
[17] CEC SB 350 Low-Income Barriers Study (Dec. 2016), p. 46.
[18] *See id.* at p. 2.
[19] *Id.* at p. 14.

Fourth, a public process is a critical component to considering the needs of DACs when creating pilot projects. The Commission has previously noted the benefit of including meaningful public participation.[20] The Commission is currently benefiting from such participation solutions and tools, such as partnering with local community-based organizations and conducting workshops in impacted communities, in R.15-03-010. Potential solutions should be driven by community input, which should involve existing networks, community leaders, and local meetings aimed at building upon community expertise.[21] Before conducting meetings, the community should be given a clear and transparent timeline with advanced notice, translators and interpreters in multiple languages should be made available, and the meeting should use engaging and diverse modes of communication. Some of the most effective ways to engage a community in demand-side type programs include: demonstrating deployment in the community; supporting individuals navigating the program application process; outreach through community-based organizations; and meeting childcare, language interpretation and translation, food, and other needs to reiterate the value of community members' time. The Commission's process should utilize all of these proven methods of engaging a community and also consider methods that are being established or currently proving effective in R.15-03-010.

Finally, the Commission can pair recruitment for the DR program with outreach for California Alternate Rates for Energy ("CARE") enrollment. It is clear that not all eligible residents in DACs sign up for CARE. The potential damage TOU rates to the economic status and quality of life of DAC residents and other low-income populations in the state cannot be understated. While CARE participation may provide some initial guidance, it cannot be used in

[20] D.12-04-046, p. 12.
[21] As the CEC SB 350 Low-Income Barriers Study noted: "Selecting better points of contact and increasing trust between program deliverers and low-income customers can increase the success of a program." CEC SB 350 Low-Income Barriers Study, p. 48.

place of real, on-the-ground generated data to adequately reflect demographic and other related conditions in DACs. Additionally, these programs (CARE and DR) should not be run as separate and apart. Any pilot for DR should test the possibility of concomitant registration in both programs as a package as well as introduce available energy efficiency program opportunities. Contractors and utilities operating the DR pilot programs should be mandated to work cooperatively and inclusively with state, regional, and local agency programs designed to increase energy efficiency and reduce community greenhouse gas and criteria pollution footprints.

- **What if any additional data is needed to inform the structure of the pilots?**

As discussed below, the Commission may use information from CAISO and/or production cost modeling to analyze how DR can replace the need for cycling.

2. **<u>Regarding location</u>:**
   - **Which geographic area or community should these pilots target in each IOU service territory?**

Sierra Club, Central California Asthma Collaborative, and California Environmental Justice Alliance support conducting pilots in a variety of geographic areas to build experience meeting the needs of all California's communities, whether they are rural, urban, inland, or coastal. Consistent with the Straw Proposal's identification of climate zones where residents are "ill equipped to manage their electricity usage to respond to TOU price signals, or simply [be] unable to shift their electricity needs due to their climate realities,"[22] one pilot should be in the San Joaquin Valley to address this specific issue. In that region, residents of DACs are exposed to some of the dirtiest air in the nation due in part to the disproportionate siting of natural gas facilities in the air basin. The San Joaquin Valley has diverse cities and unincorporated areas that are almost entirely DACs. Therefore, we recommend the San Joaquin Valley pilot's

[22] *See* Straw Proposal, p. 11.

geographic boundary include both a large central city and several adjacent unincorporated communities.

In addition, community interest must also be a significant factor in determining the location of DAC pilot projects. As noted in the CEC SB 350 Low-Income Barriers Study, trust is a particular problem in DACs accessing new energy programs. Collaboration with local community-based organizations is one way to breakdown this barrier to participation. Moreover, full community participation enables data collection, which will facilitate replication in other DACs.

Load-shed DR programs may raise special considerations if the Commission's goal is to reduce emissions from a specific natural gas power plant in an overburdened community. It would be best for pilots to deliver on-bill savings and environmental benefits to the same DACs. However, because some natural gas plants operate during off-peak hours, DR resources near a particular plant will not necessarily reduce emissions from that plant. Production modeling or coordination with CAISO can illuminate these opportunities. For instance, the Commission could order the utilities to identify the natural gas facilities that generally ramp up during peak hours (i.e., where DR is most likely to reduce emissions) and order the utilities to conduct pilots near those plants.

We believe that it would also be reasonable for pilots to deliver bill savings to different DACs than the one receiving public health benefits. Pilots must reduce pollution in a DAC, even if it is a different DAC than the one deploying the load-shed. Regardless, utilities should provide estimates regarding the location and quantity of emissions reductions in their reporting on any load-shed DR pilots.

We also encourage the Commission to expand DR deployments outside of DACs. The demand that triggers operation is often in more affluent communities in the same local capacity area as the DAC where the peaker plant is located. Steps need to be taken to ensure utilities are substantively engaging those communities by using existing DR marketing and communication tools at the same time these pilots are occurring.

3. **<u>Strategy to test for possible large-scale implementation</u>:**
   - **What strategy or strategies should the pilots test?(e.g. targeted marketing, special incentive structure, use of storage, new DR (increase use to avoid curtailment),)**

The Commission should allow a broad menu of options for the utilities' pilots, including strategic electrification, special incentive structures, use of storage, and load-shedding.

Strategic electrification. The draft Straw Proposal observes that reductions from the over 11,680 MW of combined cycle gas turbines and peaker plant capacity installed in DACs may have the greatest impact on localized air pollution from the electric sector.[23] The final Straw Proposal should recognize that DR programs can also improve air quality in DACs by deploying grid-integrated electric appliances that replace appliances that are significant sources of localized air pollution. For example, a DR program that deploys electric water heaters in DACs could provide a multitude of benefits: the grid-integrated appliances could provide ancillary services and/or load-shaping as well as reduce emissions in the community by displacing gas-fired water heaters.

Special incentive structures. A DAC-focused DR program may tailor the amount and/or timing of incentives to the needs of customers in those communities. For instance, a DAC pilot might cover the entire cost of installing a smart thermostat or electric heater to replace an antiquated, polluting natural gas wall or floor heater, whereas programs for the general

[23] Straw Proposal, p. 5.

population might cover a smaller portion of this equipment. Moreover, programs in DACs might need to deliver more up-front benefits. Low-income customers are constrained in their ability to invest in new appliances and generally demand shorter payback periods on investments in efficient appliances. Therefore, a program could cover the cost of installing a new cooling unit on the condition that it will be subject to utility control for the life of the device, rather than providing monthly or annual payments to customers who can cover up-front appliance costs.

Use of storage. At the February 15, 2018, workshop on the Straw Proposal, Tesla raised the possibility of using energy storage devices to support DR programs in DACs if the Commission waives a prohibition on exports for those programs. We support this approach. Incorporating energy storage into the DAC pilots would broaden access to energy storage technology, helping customers electrify highly-polluting appliances and align their electricity use with the needs of the grid. In turn, the use of energy storage devices to assist the grid could provide financial savings or mitigation of future impacts of potential TOU rate increases.

These pilots are an excellent opportunity to deploy load-shaping technologies, even if those technologies may be characterized as "storage" in some contexts. For instance, when Southern California Edison ("SCE") conducted its Request for Offers to procure capacity in the West LA Basin and Moorpark sub-areas, SCE contracted with NRG to deploy cooling units called Ice Bears.[24] SCE characterized this contract as thermal storage because the equipment "stores" off-peak energy in blocks of ice at night and makes the ice available for cooling during the day. These coolers beneficially shift electric load and, consequently, can help achieve the pilot goals of reducing dispatch and cycling in DACs. While SCE has gained experience deploying commercial Ice Bears through its current contract with NRG, we are unaware of utility

[24] *See* Jeff St. John, *SCE Chooses Ice Energy for 25MW of Rooftop Thermal Energy Storage*, Greentech Media (Nov. 13, 2014), https://www.greentechmedia.com/articles/read/sce-chooses-ice-energy-for-25mw-of-rooftop-thermal-energy-storage#gs.5JKafvI.

programs that successfully deploy this technology to residential customers in DACs. Thermal storage technology could help residential customers in the San Joaquin Valley adjust to TOU rates, and a pilot deploying this technology could leverage Self-Generation Incentive Program ("SGIP") funding.

Load-shed DR. The Straw Proposal includes load-shed DR as a potential resource for delivering environmental benefits to DACs. We agree that deploying load-shed DR in DACs could be a successful strategy for the pilots, but only if the Commission imposes monitoring and enforcement requirements to ensure that program participants are not *increasing* emissions in DACs by running diesel generators or other prohibited resources during DR events. If the diesel generators permitted in the Bay Area Air Quality Management District provided as little as 1% of the overall DR load reduction, DR load reduction will result in higher NO_x emissions than if a natural gas power plant had provided the same amount of energy shed through DR.[25] Similarly, once diesel generators account for 0.3% of a load reduction, DR would emit more SO_2 emissions than a peaker power plant.[26] To avoid these unintended consequences, the Commission must be able to audit and verify compliance with the existing prohibition on relying on back-up generators during DR events.[27] Specifically, any new load-shed programs in DACs should require any participant with a by-passable prohibited resource to install a data logger.[28] It is

[25] Erich Huffaker, *Not All DR Created Equal: Assessing the Role of Backup Generation in Demand Response*, UC Berkeley (2013), p. 12. Advisory work product prepared for CPUC Staff.
[26] *Id*.
[27] A similar metering requirement is part of the SGIP program. 2017 Self-Generation Incentive Program Handbook, pp. 55-57.
[28] According to Nexant, equipment and installation cost for a simple on/off data logger is $585 (this does not include the project management costs of $90). Pacific Gas and Electric ("PG&E") Advice Letter 5138-E, Attachment A, pp. 44-45 (Sept. 1, 2017), https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC_5138-E.pdf. By contrast, typical revenues from participating in PG&E's Base Interruptible Program averaged $120,000 per customer in 2015.

essential for the Commission to set robust enforcement procedures at the onset of the new DAC programs. Otherwise, participants may resist or delay the introduction of reasonable measures.[29]

- **Which customers or customer classes should the pilot target? (e.g. residential customers, community organizations and small/medium businesses that serve the community, etc.)**

The Commission should allow pilots to target a variety of customer classes. Within the San Joaquin Valley, there is a particular need to develop DR solutions for residential customers because the transition to default TOU rates threatens vulnerable customers with bill impacts that might be managed through DR technologies. Ultimately, considering these factors will ensure solutions are replicable and that residential, community organization, and small/medium commercial customers in DACs all have meaningful access to DR programs.

4. **<u>Low-Income Energy Efficiency Pilots for CARE customers</u>:**
   - **How would you use the $750,000 budget from the low income energy efficiency proceeding (Decision 17-12-009) in the service of the demand response pilots for disadvantaged communities given these funds must benefit CARE customers specifically?**

We appreciate the Commission's efforts to leverage low-income energy efficiency to broaden participation in DR. The Commission already requires education on DR options for customers who install measures through the Energy Savings Assistance program.[30] However, the Commission can go further with a pilot program that seamlessly integrates energy efficiency and DR in a DAC. The pilot could pool funds[31] from the energy efficiency proceeding and this proceeding to install programmable communicating thermostats ("PCTs") and use funds from this proceeding to compensate customers for allowing the utility to control the equipment.

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[29] *See, e.g.*, Draft Comment Resolution E-4906, p. 57 ("We agree with the Joint DR Parties and ORA that because the Commission did not factor the cost of verification when directing DRAM contracts, they should be exempt from cost burdens until the next DRAM cycle, which begins in 2020.") (footnote omitted).
[30] D.17-12-009, Attachment 1, p. 404 (Dec. 20, 2017).
[31] To ensure that the funds from D.17-12-009 benefit CARE customers, the number of CARE customers receiving PCTs would need to be proportionate to the funding coming from the low-income energy efficiency proceeding.

Customers could choose to participate in only the energy efficiency measure, which would allow the pilot to compare the behavior and benefits of the "EE only" and "EE+DR" groups. We predict that participating customers will strongly prefer giving the utility control over their thermostat to programs and price structures that require the customer to actively manage their thermostat, but the Commission should endeavor to verify that assumption with on-the-ground data collection and outreach. The Commission can test this hypothesis by seeing if participating customers choose utility-controlled DR, time-variant rates, or both.

Conclusion

We thank the Commission for prioritizing the deployment of demand response in disadvantaged communities and developing pilots that tailor demand programs to the needs of these communities. Although Decision 17-12-003 set aside a relatively small pool of funds for this set of pilot projects, there are vast and diverse opportunities for demand response in disadvantaged communities. We encourage the Commission to scale up successful programs statewide and conduct additional pilots in future dockets.

Respectfully submitted,

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