Clean Coalition
Making Clean Local Energy Accessible Now

Energy Resources Conservation and Development
Commission of the State of California
1516 Ninth Street, Sacramento, CA
Re: Comments on Puente Power Facility

June 14, 2017

Dear Commissioners,

The Clean Coalition opposes the approval of the Puente Power project and recommends the energy needs of the Moorpark sub area be met with distributed renewable resources (DER). Building natural gas plants is inconsistent with California policy goals to reduce the use of fossil fuels in the energy sector, because such construction locks in the use of fossil fuels for the many decades of the natural life of the project. Furthermore, this approach also risks locking in more expensive power for many decades to come, since the cost trajectories of renewables—especially solar and storage—are on a path to be cheaper than natural gas within years, if not already. Locking in a need for natural gas also puts ratepayers at the mercy of unpredictable natural gas markets. These problems can all be resolved by careful and thoughtful consideration of renewable power solutions.

Not only would this approval by unwise, but this approval also constitutes a clear violation of the Commission's legal obligations under California Environmental Quality Act (CEQA). First, the Staff Assessment excludes consideration of any Distributed Energy Resources (DER) through an illegally narrow and restrictive statement of project objectives. California courts have repeatedly rejected the adoption of restrictive objectives without a solid basis in substantial evidence. Second, the Staff Assessment presents no substantial evidence in support of its assertion that DER would be infeasible or could not meet the technical requirements for the Puente Power Project. In fact, neither statement is remotely true. As shown below, DER can fully achieve these standards with zero emission generation,

demand management, and storage. Thus, the Commission's process is legally inadequate until DER are thoroughly considered on the basis of substantial evidence.

In light of the above, we propose a DER solution involving a mix of groundmount and rooftop solar with storage and advanced inverters. Other load serving entities in Arizona and Hawai'i have demonstrated that such projects are fully capable of meeting all required services that would otherwise be provided by the Puente Power Project. The Moorpark sub area has a vast capacity for employing solar resources in combination with energy storage as well as significant opportunities for cost effective demand response[1] to meet the needs of the area.

Finally, given the critical importance of California Independent System Operator (CAISO) study, we support the City of Oxnard's request for additional time in the schedule to comment on the study's assumptions.

Therefore, the Clean Coalition urges the Energy Commission to reject this application and direct Southern California Edison (SCE) to pursue alternatives which are less costly and environmentally damaging in the long term.

Distributed Energy Resources have been excluded from consideration through an illegal narrowing of Project Objectives

The Puente Power Project Final Staff Assessment (Staff Assessment) inappropriately excludes consideration of DER as an alternative approach by impermissibly drawing narrow Project Objectives and declaring alternatives infeasible without supporting evidence. The Certified Regulatory Program of the California Energy Commission (CEC) is exempt only from Chapters 3 and 4 of CEQA regarding the specifics of the format of an Environmental Impact Report (EIR), but the Commission process is not exempt from the general requirements of the rest of

[1] Demand Response Potential for California SubLAPs and Local Capacity Planning Areas: An Addendum to the 2025 California Demand Response Potential Study" Lawrence Berkeley National Laboratories (April 2017)

CEQA. Importantly, CEQA, the CEQA Guidelines, and the CEQA caselaw make clear that the analysis of alternatives may not be unreasonably or unfoundedly restricted by the adoption of artificially narrow objectives.

As noted in the Staff Assessment CEQA must consider feasible alternatives which would reduce significant impacts. (CEQA Guidelines 15126.6.) "'[I]t is the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects." (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564-565. *See also, Laurel Heights Improvement Association v. Regents of the University of California* (1988) 47 Cal.3d 376). While the choice of alternatives is subject to the rule of reason, the choice of alternatives must not presuppose the ultimate decision by the agency.

The Commission may not exclude alternatives by using an impermissibly narrow description of the underlying project objectives. "A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the [environmental document] and will aid the decision makers in preparing findings. The statement of objectives should include the underlying purpose of the project." (*In re Bay-Delta, etc.* (2008) 43 Cal. 4th 1143, 1163.) Substituting a description of the nature of the project for a clear statement of the *underlying objectives* of the project fails to provide guidance to develop that reasonable range of alternatives. (*Habitat and Watershed Caretakers v. Regents of the University of California* (2012) 213 Cal.App.4th 1277.)

Here, the Staff Assessment erroneously and cursorily rejects consideration of any DER-based solution as unable to meet the basic project objectives. However, the objectives laid out in the Final Staff Assessment are unreasonably narrow and describe the nature of the project rather than its underlying purpose. By laying out at the outset that the project must "require the development of 262 MW nominal output of newer, more flexible and efficient gas generation" the Staff Assessment

automatically excludes any alternatives of delivering 262 of MW nominal output of newer, more flexible and efficient generation using any other technologies, including combined solar and storage, demand response, or any other option. Similarly, expressing the objectives as being to install a "simple-cycle, natural gas-fired combustion turbine" completely unreasonably excludes any alternative efficient, reliable, and predictable power supply.

Given the availability of environmentally superior alternatives to meet identical engineering requirements, there is no reason to set the use of natural gas as an objective of the project. Similarly, there is no reason why the project should aim to site capacity on industrial land use designations, since the zoning of the location of facilities has no impact whatsoever on the reliability or capacity of the electrical grid.

Distributed energy resources have been excluded from consideration with unsupported claims that DER are not feasible alternatives

The Commission is also in error in assuming that DER cannot meet the grid requirements to replace the Puente Power Project. The Final Staff Assessment conclusorily states that DER cannot feasibly meet project objectives without present no supporting substantial evidence. Under CEQA, "[i]n determining the nature and scope of alternatives to be examined in an [CEQA analysis], the Legislature has decreed that local agencies shall be guided by the doctrine of 'feasibility.'" (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564-565.) "A potentially feasible alternative that might avoid a significant impact must be discussed and analyzed in an EIR so as to provide information to the decision maker about the alternative's potential for reducing environmental impacts." (*Habitat and Watershed Caretakers v. Regents of the University of California* (2012) 213 Cal.App.4th 1277.) "Feasible" means "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors." (Pub. Res. Code § 21061.1.) Until

feasible DER alternatives have been reviewed, the Commission is in no position to make an informed decision regarding the feasibility of these solutions, much less determine the relative merits of less environmentally destructive approaches.

In fact, the Staff Assessment inappropriately relies on the CPUC process rather than providing substantial evidence as to the infeasibility of renewable alternatives. The Staff Assessment claims to have "not perfunctorily eliminated preferred resources from the alternatives analysis due to that limitation" based on a fully unsubstantiated claim that preferred resources "cannot fully substitute for generating capacity in providing reliability services." (FSA, at 4.2-8.) However, the Staff Assessment nowhere provide any evidence for this claim, but instead relies on "the CPUC said so" as evidence: "In approving the contract, the CPUC has effectively found that preferred resources, beyond those assumed to be developed in setting the local capacity requirements (LCR) for the Moorpark sub-area, a share of which SCE procured in response to its RFO, could not feasibly and reliably be counted on to cost-effectively meet local reliability needs." However, a review of the CPUC's decision shows that the CPUC made no such finding at all. The finding of fact 26 in D.13-12-015 states, "Other resources can also meet or reduce LCR needs, but may not be effective in doing so." Thus, there is only a supposition, but no substantial evidence in the record demonstrating infeasibility.

Similarly, in responses to comments by the City of Oxnard, again the Staff Assessment relies upon the CPUC process, rather than on any substantial evidence by observing "[t]he comment assumes that there are large quantities of preferred resources (including energy storage) in the Moorpark sub-area that could contribute to meeting local reliability requirements" and points to the fact that a DER solution was not selected by SCE for approval. However, this only demonstrates that either developers were not positioned to develop and submit RFO bids in the relatively short time frame, or that SCE did not select such resources for reasons potentially unrelated to infeasibility. Whether or not this process was appropriately conducted does not relieve the Commission of its legal obligation to substantial

evidence evaluating whether potentially feasible alternatives are "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors." (Pub. Res. Code § 21061.1.)

Indeed, in response to comments, Staff admits that "Staff did not state or imply that preferred resources were excluded from the [Request for Offers (RFO)] or could not meet a share, or, under some circumstances, even all of the capacity needed in the Moorpark sub-area to ensure local reliability." (Response to Comment 25, Final Staff Assessment at 4.2-137.) Instead, Staff merely opines, without any evidence, substantial or otherwise, that

> "215 to 290 MWs authorized was required 'to meet local capacity requirements.' In other words, it was to have operational characteristics similar to those of NGFG, thus eliminating (non-dispatchable) distributed solar." (Response to Comment 26, at FSA 4.2-138).

Similarly, Staff dismisses the use of solar without evidence by conclusory asserting, "[a]s distributed renewables are predominantly solar, a generation technology that is not dispatchable, they do not meet this requirement." (Response to Comment 28, FSA at 4.2-139.) By making such statements without even the most marginal presentation of evidence in support, Staff has "perfunctorily eliminated preferred resources from the alternatives analysis." (FSA at 4.2-8.)

In fact, not only are these statements unfounded, they are also incorrect. In making these conclusory statements, Staff has clearly ignored dispatchable solar (*i.e.*, solar coupled with storage and advanced inverters). In fact, not only is such technology dispatchable to meet all underlying objectives of the project, but such technology is currently being deployed precisely to meet these needs in various locations around the county, including in the Moorpark subarea.

Distributed energy resources are a feasible substitute for the Puente Power Project.

Cost-effective, dispatchable solar plus storage projects are winning competitive bids to provide precisely the kinds of services that Puente Power Project would provide in communities such as Tucson, AZ and Kaua'i, HI. Facilities of this kind would avoid or reduce a great many of the potentially significant impacts of the Puente Power Project. Furthermore, the use of solar and storage may be superior for meeting objectives of deploying facilities on brownfield sites. Because ground mounted solar facilities are highly modular, the precise acreages available are not necessary to establish in order to accommodate a single large facility.

Solar and storage alternatives are feasible and cost effective

The combination of solar and storage with advanced inverters are certainly technically feasible, as demonstrated by the profusion of projects currently in deployment. Furthermore, the cost trajectories of these technologies will make these applications as peaker replacements increasingly competitive as costs decline.

Certainly, the unsubsidized levelized costs of various solar alternatives have been estimated to be a fraction of natural gas peaker costs. According to Lazard's latest Levelized Cost of Energy Analysis, the unsubsidized, levelized cost of a typical large gas peaker (100 to 200MWAC) ranges between $165/MWh to $217/MWh in the United States (Appendix, L2 & L8).[2] Taking into account reasonable fuel cost variations of +/- 25% expands the range on either end by $10/MWh (Appendix, L5). While US domestic natural gas production is forecast to increase slightly, it is important to note that pricing is also trending up:

> "New natural gas export capabilities and growing domestic natural gas consumption contribute to the forecast Henry Hub natural gas spot price rising from an

[2] Lazard's Levelized Cost of Energy Analysis, v. 10.0 (December 2016).

> average of $3.17/MMBtu in 2017 to $3.43/MMBtu in 2018."[3]

Furthermore, nearer-term trading data for summer 2017 deliveries indicate as high as a 41% above-average price, [4] which could be very reasonably applied to the high-end LCOE would result in a spot peaker price of ~$306/MWh.

Even if we were to be generous in assuming that the Puente Power Project PPA aligns more with the low end of the gas peaker price range (which is more representative of much large plants), we can see that the fuel cost comprises nearly 22% of the total LCOE (Appendix, L12). Additionally, the gas peaker has a minimum of $6/MWh of fixed O&M plus $5/MWh of variable O&M costs, whereas in comparison against all categories of non-residential solar photovoltaic (PV), the solar PV fixed O&M cost averages only $5.25/MWh, with no variable maintenance costs. On the high side, the total O&M costs for a gas peaker actually surpass the contribution from fuel cost to the price of the gas plant (Appendix, L13).

In contrast, the companion analysis of solar levelized costs places the solar component of solar and storage facilities at $50 to $90 per MWh.[5] As noted in the Staff Assessment, rendering such power dispatchable will require a storage component. We note that unlike natural gas peakers, such storage facilities can provide a much broader array of services than natural gas peakers alone, such as frequency and voltage regulation. (See discussion of avoiding cost of synchronous condensers below.) Companion estimates place unsubsidized levelized cost comparisons of 400MWh peaker replacement storage in the range of $275 to $400 per MWh[6] before incentives and subsidies. Since these costs are declining on the order of 14% per year and are expected to decline by 40% in the next five years, the commitment to natural gas today has the consequence of locking ratepayers into

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[3] (EIA short-term energy outlook 5/9/17).

[4] EIA short-term energy outlook 5/9/17.

[5] Lazard's Levelized Cost of Energy Analysis, v. 10.0 (December 2016).

[6] Lazard's Levelized Costs of Storage, v. 2.0 (December 2016)

more expensive energy for decades to come, even though alternatives are likely to be cheaper even without subsidies or support by 2020.

Given that a combined solar and storage facility would not necessarily require the same scale of storage and current price trends, beating a $316 spot price is well within the realm of feasibility. In fact, using the same lens of unsubsidized, levelized cost to the purchasing utility, Lazard's preliminary analysis of such an illustrative offering located in the U.S. Southwest placed the cost of an approximately 200MW_{AC} PV and 110MW_{AC} storage combined plant at $92/MWh, utilizing either crystalline or thin film, with the attendant battery system sized to a 52% capacity factor (equal to usable energy capacity of ~400MWh_{DC}) (Appendix, L3). When the effect of the Investment Tax Credit is figured in for the solar technologies, we see a further reduction of $12/MWh (Appendix, L4), pointing to an effective price of $80/MWh.

Not surprisingly, several installed or in deployment projects are delivering consistent power to displace fossil fuel uses in real world applications at delivered prices of between $45 and $110 per MWh, which is significantly lower than the likely costs of the Puente Power Project.

Even if solar plus storage costs are somewhat higher, this does not render the technology as an infeasible alternative. CEQA does not mandate the adoption of the lowest cost alternative, but rather requires consideration and sometimes adoption of alternatives which can avoid potentially significant effects, which can include high than necessary carbon emissions, smog, health impacts from particulate matter and a lack of resiliency.

1. **Solar and storage projects in the Moorpark area have demonstrated strong feasibility of the necessary components in this service area.**

First, the clear feasibility of solar only projects in the Moorpark area is demonstrated by the recent success of the 1 MW Calle Real Solar Photovoltaic project in Goleta, which has produced 10% more energy over five years than

initially projected in 2010.[7] Since then, costs have declined and efficiency has risen. Additionally, the Commission recently approved 15 MW of 4-hour duration energy storage in Santa Paula (part of the Moorpark area) as part of SCE's 2014 energy storage solicitation, precisely representing an example of the scale and capabilities required and available from non-emitting local resources. Furthermore, other on-going solicitations are likely to deliver both generation and storage capacity to meet local capacity and resilience needs. Certainly, the solar generation component of any peaker replacement project is highly cost effective and avoids potentially significant impacts.

2. **The Moorpark area has hundreds of megawatts of demonstrated solar siting opportunity.**

Not only have the necessary technologies been deployed in cost effective projects nationally and locally, but the Moorpark subarea also hosts enough solar siting opportunity to allow for cost effective deployment of DER capacity vastly in excess of identified reliability and resilience needs.[8] For example, solar siting surveys of a section of Orange County (which is geographically similar to the Santa Barbara area) have identified some 160 MW of built environment siting opportunity, without considering opportunities on brownfields of various sizes or greenfield groundmount options. Given that the initial authorization for this procurement in D.13-02-015 cited siting limitations as a rationale for proceeding quickly in the Big Creek/Ventura local area, this greater siting flexibility associated with distributed solar argues strongly for consideration of alternative DER approaches to meeting local need. Furthermore, since distributed solar is substantially faster to install than construction (or replacement, in case of

[7] "Santa Barbara County Solar Project Exceeds Projected Output Resulting in initial Savings of $1.2 million," *County of Santa Barbara*, https://www.countyofsb.org/asset.c/2875, 2 May 2017.

[8] Solar Siting Survey: SCE Preferred Resources Pilot, *Clean Coalition,* http://www.clean-coalition.org/resource/solar-siting-surveys/sce-prp/.

catastrophic failure) of a natural gas plant, the Commission would be remiss to ignore the value of DER approaches.

3. Kaua'i AES Solar and Storage Project delivers 20MW of resilience and reliability services at 11 cents per kWh.

Critically, solar plus storage project are now cost competitive with fossil fuel sources around the country. Reliable DER projects of similar scale are quickly coming online to deliver precisely the full suite of services that the Puente Power Project would provide. For example, in January 2017, Kaua'i Island Utility Cooperative and AES Distributed Energy, Inc. announced a power purchase agreement for the delivery of 28 MW solar photovoltaic power and 20 MW of five-hour duration storage at a cost of 11 cents per kWh.[9] (See the press release, attached, Appendix A.) This project was developed to displace the current fossil fuel powered system and deliver incremental dispatchable capacity, reliable power and stable rates to ratepayers for a utility that had already seeing up to 100% penetration of distributed PV capacity relative to peak load. This project is expected to be operational within two years of the signing of the PPA. Such systems, utilizing advanced inverters, could provide power generation, reactive power, and short circuit duty at a potentially competitive cost, relative to the adverse impacts of the Puente Power Project or costs of supplemental synchronous inverters. Given the economies of scale that could result from the installation of ten similarly sized projects throughout the Moorpark area and cost trends, the realized costs of such an approach would likely be lower than that achieved on Kaua'i.

[9] "KUIC and AES Distributed Energy Announce Plan to Construct Innovative Renewable Peaker Plan on Kaua'I Utilizing a Hubrid Solar and Battery Storage System," *Kaua'I Island Utility Cooperative*, http://kiuc.coopwebbuilder2.com/sites/kiuc/files/PDF/pr/pr2017-0110-AES%20Solar.pdf, 10 Jan 2017.

4. **The Valencia Gardens Energy Storage project demonstrates the feasibility in California of solar plus storage microgrid solutions.**

Similarly, the Valencia Gardens Energy Storage (VGES) project in San Francisco will add 750 kW / 750 kWh of energy storage to the roughly 800 kW of rooftop solar that is already interconnected to the distribution grid within the Valencia Gardens Apartments. The VGES project will increase solar hosting capacity of the feeder line segment by at least 50% (i.e., enabling at least 400 kW of additional solar to be interconnected to the local distribution grid) and will demonstrate the economics of utilizing energy storage for provisioning grid services through wholesale markets. Furthermore, the project will include a study of islanding capacity to demonstrate the full set of costs and benefits to providing community microgrid resilience to priority loads within the neighborhood, including those at the Valencia Gardens Apartments and nearby PG&E customers.

5. **Tucson Electric Power delivers 100MW of solar with 120 MWh of storage at $45 per MWh**

NextEra Energy's Tucson Electric Power project presents a compelling example of real world feasibility. As reported this project delivers on a PPA all in at $45 per MWh. For comparison, the unsubsidized cost appears to be approximately $90 per MWh.[10] This is both fully consistent with Lazard's estimates and in line with the pricing of the Kaua'i project, but at a much larger scale.

[10] "How can Tucson Electric get solar + storage for 4.5¢ /kWh?" *Utility Dive* http://www.utilitydive.com/news/how-can-tucson-electric-get-solar-storage-for-45kwh/443715/ 30 May 2017.

6. Smaller projects at Salt River, AZ and Minster, OH demonstrate competitive feasibility of solar and storage

Two smaller solar plus storage projects, the Salt River Project in Arizona[11] and the Village of Minster municipal project,[12] also demonstrate the real-world feasibility of such approaches. Although these are 20MW and 3MW/3MWh projects, the fact that both were implemented following a competitive process and are reportedly economically viable strongly suggests that such solutions are viable.

The additional cost of synchronous condensers can be avoided entirely through the use of storage with advanced inverters

Furthermore, in the discussion of the use of clutches and synchronous condensers, Staff miss the fact that storage with advanced inverters can provide better voltage and frequency regulation with much faster enhanced frequency response (less than 1 second) than can synchronous condensers, and at a vastly lower cost. In fact, solar generation and storage facilities using advanced inverters represent an example of a superior solution to any of these proposals to meet both generation and voltage stabilization.

The combination of power from solar generation and/or storage can be used to stabilize voltage by modulating the output of real power or by injecting or absorbing reactive power from the grid as reactive power compensation or dynamic reactive power control.[13] Such facilities have been deployed cost-effectively to provide grid resilience and reliability in Hawai'i, California, and elsewhere. These

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[11] "Salt River Project signs PPA for 20 MW solar+storage project" *Utility Dive* http://www.utilitydive.com/news/salt-river-project-signs-ppa-for-20-mw-solarstorage-project/441015/ 24 April 2017.

[12] "Inside the first municipal solar-plus-storage project in the US" *Utility Dive,* http://www.utilitydive.com/news/inside-the-first-municipal-solar-plus-storage-project-in-the-us/421470/ 5 July 2016.

[13] National Renewable Energy Laboratory, "Advanced Inverter Functions to Support High Levels of Distributed Solar," *NREL*, http://www.nrel.gov/docs/fy15osti/62612.pdf, Nov 2014.

projects have demonstrated that these solutions can provide short circuit duty and voltage maintenance services with faster response times using advanced inverters. In fact, many existing inverters can serve this function with only a software upgrade, saving the need for expensive hardware modifications to existing plants or for installations of entirely new facilities.

Thus, in addition to the competitive cost of energy delivery from solar + storage DER solutions, such solutions also generate value in the form of avoided costs from having to have supplementary facilities to deliver voltage and frequency regulation services, making DER solutions even more feasible economically than direct price comparisons show.

Demand Response is a more cost-effective approach to meeting capacity needs

In addition, the need for a natural gas peaker plant can be eliminated or reduced by reducing peak load through demand response. A recent study by the Lawrence Berkeley National Laboratories found that in the Big Creek/Ventura area approximately 260MW of demand response opportunity could be potentially obtained at a cost of $100 per MWh. [14] Clearly, such an approach is both technically feasible and cost effective. Again, the Staff Assessment is clearly in error in asserting that DER are infeasible or cannot meet the capacity requirements.

Conclusion: DER alternatives must be considered as both feasible and cost-effective options.

DER has been demonstrated to be both technically feasible and potentially cost effective and so must be considered within the context of any CEQA analysis. The fact that solar plus storage projects are being bid and deployed across the country at both small scale and utility scale mitigates strongly both against the

[14] "Demand Response Potential for California SubLAPs and Local Capacity Planning Areas
An Addendum to the 2025 California Demand Response Potential Study" Lawrence Berkeley National Laboratories (April 2017) at 61.

conclusory statements that DER solutions cannot match or exceed the performance characteristics of natural gas peaker plants, and against the notion that such environmentally superior projects cannot be cost effective as well. In addition, studies of Demand Response opportunities have shown tremendous and cheaper opportunities in the Big Creek/Ventura area. Although a full analysis will shed additional light, clearly DER alternatives cannot be reasonably excluded from consideration based on the feasibility and project objectives rationales provided in this proceeding. We therefore urge the Commission to reconsider its rejection of evidence and testimony from all parties regarding DER solutions, give such alternatives a fair hearing, and if they prove to be environmentally superior and feasible as defined under CEQA, reject the Puente Power Project in favor of superior alternatives.

Respectfully submitted,

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