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STATE OF CALIFORNIA

State Energy Resources
Conservation and Development Commission

In the matter of: Application for Certification of the **PUENTE POWER PROJECT**	DOCKET NO. 15-AFC-01 **INTERVENORS SIERRA CLUB LOS PADRES CHAPTER, ENVIRONMENTAL COALITION OF VENTURA COUNTY, AND ENVIRONMENTAL DEFENSE CENTER**

BRIEFING ON CAISO STUDY

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Table of Contents

BRIEFING ON CAISO STUDY

Pursuant to the June 20, 2017 Committee Order, Sierra Club, Environmental Defense Center and Environmental Coalition of Ventura County ("Intervenors") respectfully submit the following Brief on the California Independent System Operator Moorpark Sub-Area Local Capacity Alternative Study, dated August 16, 2017 ("CAISO Study").[1]

I. INTRODUCTION

As set forth in Intervenors' Opening and Reply Briefs, the Proposed Puente Project ("Puente") would violate City of Oxnard land use policies, undermine efforts at climate adaption, destroy wetlands and sensitive habitat, and prolong a legacy of environmental injustice that has long compromised air quality and recreational opportunity for the Oxnard community. Because Puente is inconsistent with numerous laws, ordinances, regulations and statutes ("LORS"), the Warren-Alquist Act prohibits the Energy Commission from approving Puente unless it determines "that the facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving public convenience and necessity."[2] In addition, because Puente would result in significant and unavoidable impacts to biological resources, land use, air quality, environmental justice and coastal hazards, under the California Environmental Quality Act ("CEQA"), the Commission cannot approve Puente where there are feasible alternatives that would "substantially lessen" the project's significant effects.[3] The CAISO Study demonstrates that the local capacity need that is the basis for Puente's procurement can be feasibly met through preferred resources and reactive power solutions that

[1] Intervenors' Briefing on the CAISO Study addresses the feasibility of the Study's alternative scenarios. The relationship between the CAISO Study and the override findings needed to approve the proposed project is more fully addressed in Intervenors' concurrently filed Reply Brief.
[2] Pub. Res. Code § 25525.
[3] Pub. Res. Code § 21002.

avoid Puente's many LORS inconsistencies and environmental impacts. Given the feasibility of these alternatives, Puente may not be lawfully approved.

As the CAISO Study concludes, "applicable reliability criteria can be met with a combination of base incremental distributed resources and some combination of energy storage or dynamic reactive support."[4] The Study's distributed resource deployment assumptions are based on input from Southern California Edison ("SCE") and are a reasonable level of achievable procurement that confirm Intervenors' long-held position that there is significant additional preferred resource procurement potential in the Moorpark area, potential that would go unrealized were Puente approved. With regard to the Study's cost estimates, CAISO was clear that it "does not believe that the capital costs identified in the ISO study render the preferred resource alternatives infeasible."[5] Moreover, the Study's cost estimates did not account for more recent market data projecting significantly lower energy storage and solar capital costs, the lower capacity costs of distributed resources able to access multiple revenue streams, and a more cost-effective suite of preferred resources that would avoid the need for the 9-hour batteries the CAISO Study assumed in scenarios that did not deploy reactive power to partially meet local reliability need.

NRG's assertions that preferred resource and reactive power alternatives would not meet reliability need do not withstand scrutiny. For example, NRG suggested Scenario 2, which would deploy both reactive power and distributed resources, does not meet CAISO's reliability criteria. However, CAISO repeatedly stated Scenario 2 does, in fact, meet applicable reliability criteria, criteria that are established under NERC, WECC and ISO standards to specifically

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[4] Exh. 9000, CAISO Study, p. 29.
[5] TN 221283, Transcript of 09/14/2017 Evidentiary Hearing ("9/14/2017 Transcript") 15:17-19 (CAISO, Millar).

ensure "adequate local area reliability." NRG's complaints over the reliability of preferred resources similarly lack evidentiary support and ignore the significant reliability risks posed by locating Puente on a site both the California Coastal Commission and Coastal Conservancy have determined is vulnerable to coastal flooding and sea level rise.

Finally, preferred resource and reactive power alternatives to Puente can be timely deployed to meet the scheduled December 31, 2020 once-through-cooling ("OTC") retirement dates for Ormond Beach and Mandalay Unit 1 and 2. Should additional time be needed, the 130 MW Mandalay Unit 3 can serve as a bridge until replacement resources are fully deployed. In any event, the potential for an OTC extension to accommodate preferred resource deployment is no greater than for Puente. In contrast to energy storage resources that can be deployed within three months of contracting, Puente requires 2 ½ years from the time of a final non-appealable decision before it is operational. Moreover, given that an OTC extension was recently granted to accommodate delays in deployment of the Carlsbad gas plant, OTC deadlines should not be used as a pretext to condemn Oxnard to 40 more years of industrialized coastal development and its resulting impacts.

As the CAISO Study makes clear, California has reached a turning point where it need no longer rely on new fossil-fueled power plants to meet local reliability needs. Given the availability of non-polluting alternatives that both avoid Puente's many adverse consequences and further California's environmental justice, climate adaption, and greenhouse gas reduction priorities, the Commission must deny approval of the project.

II. ARGUMENT

A. Deployment of Preferred Resource and Reactive Power Are Technically Feasible Solutions to Meeting Local Capacity Need.

The CAISO Study establishes that preferred resource alternatives are technically capable of meeting Moorpark area need. The Study concludes that "applicable reliability criteria can be met with a combination of base incremental distributed resources and some combination of energy storage or dynamic reactive support."[6] As CAISO further confirmed at evidentiary hearings, its study demonstrates "that there are technologically feasible alternatives relying on preferred resources that could meet the need otherwise met by the proposed Puente project."[7] CAISO's conclusion that local area need can be met with non-polluting alternatives is not in dispute.[8]

B. Sufficient Preferred Resources and Reactive Power Can Be Procured in the Moorpark Area to Meet Local Capacity Need.

Procurement of sufficient preferred resources and reactive power to meet Moorpark area reliability need can also be reasonably assumed. The 135 MW of distributed energy resources CAISO assumed in each base case scenario is a reasonable, if not conservative, level of expected procurement of distributed resources through a new request for offers ("RFO") or other procurement mechanisms. The CAISO Study's distributed resource assumptions were "based on what was viewed as the reasonable ceiling of what could be procured" by extrapolating from the results of more recent solicitations.[9] SCE worked with CAISO to develop the 135 MW base

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[6] Exh. 9000, CAISO Study, p. 29.
[7] 9/14/2017 Transcript 13:9-13 (CAISO, Millar).
[8] *See* 9/14/2017 Transcript 194:4-8 (City of Oxnard, Caldwell) ("the first and foremost thing is that the preferred resource alternatives are technically feasible. I think that's clear. I don't think there's been any testimony that says that that's not true."); 296:20-23 (CEC, Kramer) ("[i]t doesn't sound as if anybody is arguing with the conclusion of the ISO that it's theoretically technically feasible.").
[9] 9/14/2017 Transcript 19:15-17 (CAISO, Millar); 113:9-20 (SCE, Chinn).

case. SCE started "from what [it] knew from recent procurements, and then running this comparison between the two regions, in terms of the characteristics, [it] made some estimates of what the Moorpark potential targets for [distributed energy resources] would be."[10] With regard to the procurement potential for in-front-of-meter ("IFOM") energy storage, CAISO properly "assumed that if one went out to procure transmission-connected battery storage…you would be able to get the amount that you're asking for."[11]

CAISO and SCE's 135 MW distributed resource projection for the Moorpark area confirms that assertions in the Final Staff Assessment ("FSA") that preferred resource potential in the Moorpark area is limited to the resources that were procured in the 2013 Moorpark all-source RFO are not credible.[12] As SCE testified in the Moorpark proceeding at the California Public Utilities Commission ("CPUC"), when the 2013 Moorpark RFO was issued, "the market was focusing their effort on the Western LA Basin" RFO, which offered a much larger procurement opportunity and minimum preferred resource procurement requirements.[13] SCE's observation was recently reiterated by Mr. Owens of Stem, who testified that Stem bid into the LA Basin RFO and not the Moorpark RFO because at that time, Stem decided to focus its more limited resources and staff on the larger LA Basin solicitation.[14] In addition, because the market has rapidly evolved since the time of the Moorpark RFO, its results are not indicative of future RFO performance. Since the time of the Moorpark RFO four years ago, Stem and other preferred resource providers have "experienced dramatic growth," cost of deployment has

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[10] 9/14/2017 Transcript 124:5-10 (SCE, Chinn).
[11] 9/14/2017 Transcript 21:1-5 (CAISO, Millar).
[12] Exh. 2000, FSA Part 1 of 2 at 4.2-132 ("[t]he lack of a 'robust response' to the [Moorpark] RFO … indicates that such resources were not available.").
[13] Exh. 4001, A.14-11-016 Hearing Transcript, 80:23-24 (SCE, Bryson).
[14] 9/14/2017 Transcript 179:7-14 (Stem, Owens).

decreased, and Stem "would look at the Moorpark opportunity as one where multiple vendors would be successful and could help deliver the capacity required."[15] Mr. Schwartz of Tesla similarly testified that, like Stem, Tesla has gained significant experience in distributed resource deployment since 2013 that would "drive a more robust response to an RFO if held today."[16]

Testimony by NRG witness Dawn Gleiter suggesting that resource potential in the Moorpark area is limited due to a purported high-level screening analysis NRG conducted at the time of the Moorpark RFO is of no evidentiary value.[17] Ms. Gleiter did not conduct or oversee this now four-year old analysis nor did the asserted screening exercise even examine demand response potential with large energy consumers in the Moorpark area.[18] Ms. Gleiter's attempt to take issue with the CAISO Study's use of other recent RFO's to help determine Moorpark preferred resource potential because local capacity areas are "not directly analogous" is equally unavailing.[19] SCE did in fact account for regional differences in characteristics such as peak load, peak hours, customer classes, and population when reaching its estimate of 135 MW of incremental distributed resource availability for the Moorpark area.[20] Similarly, Ms. Gleiter's concern that not all 135 MW of distributed resources "are necessarily going to materialize as planned" ignores the reality of utility procurement.[21] SCE has historically used a waitlist to "seamlessly reach its procurement target" in the event "shortlisted projects dropped out during

[15] 9/14/2017 Transcript 181:3-6 (Stem, Owens).
[16] 9/14/2017 Transcript 181:21-22 (Tesla, Schwartz).
[17] 9/14/2017 Transcript 267:16-25 (NRG, Gleiter).
[18] 9/14/2017 Transcript 300:10-301:7 (NRG, Gleiter).
[19] 9/14/2017 Transcript 268:4-22 (NRG, Gleiter).
[20] 9/14/2017 Transcript 123:15-24 (SCE, Chinn).
[21] 9/14/2017 Transcript 273:8-9 (NRG, Gleiter).

the negotiation process."[22] Finally, Ms. Gleiter's candor with this Commission is suspect. While Ms. Gleiter asserted at hearings that NRG "was successfully awarded 174 megawatts of preferred resources contracts" in SCE's LA Basin RFO, the CPUC rejected 70 MW of those contracts because they were not preferred resources, but gas-fired back-up generation.[23]

Indeed, contrary to Ms. Gleiter's assertions, CAISO and SCE's estimates of the availability of incremental distributed resources that can reasonably be procured in the Moorpark area are likely understated. For example, the Lawrence Berkeley National Lab study on demand response potential shows much higher demand response potential than assumed in the CAISO study.[24] The CAISO Study also did not include *any* incremental procurement of energy efficiency, even though the Study only assumes a low-mid AAEE forecast and does not account for the required cumulative doubling of energy efficiency under SB 350.[25] Accordingly, the record strongly supports a determination that a sufficient level of preferred resources to meet Moorpark area need in lieu of Puente can feasibly be procured.

With regard to the 240 MVar of dynamic reactive power CAISO found could be deployed with 135 MW of distributed resources to meet local area need under Scenario 2, Ms.

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[22] Exh. 4007, Testimony of SCE in Support of Application for Approval of the Results of its Second Preferred Resources Pilot Request for Offers, p. 23 (setting "a 150 MW shortlist target and a 50 MW waitlist" to meet a 100 MW preferred resource procurement target).

[23] 9/14/2017 Transcript 264:10-11 (NRG, Gleiter); CPUC, Decision 15-11-041, Decision Approving, In Part, Results of SCE LCR RFO for the Western LA Basin (Nov. 19, 2015), p. 12, http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M156/K064/156064924.PDF.

[24] Exh. 3079, LBNL, Demand Response Potential for California SubLAPS and Local Capacity Planning Areas, p. 61 (showing 810 MW of demand response potential in Big Creek Ventura subarea at $400/MW); 9/14/2017 Transcript 329:10-19 (Clean Coalition, Karpa (the hearing transcript mistakenly identifies the speaker as Mr. Theaker)). The CAISO Study assumes a $485 MW/hr cost for energy storage. Exh. 9000, CAISO Study, p. 24.

[25] Exh. 3090, James H. Caldwell Testimony in Response to CAISO Report, pp. 3-4; 9/14/2017 Transcript 55:9-20 (CAISO, Millar). The low-mid AAEE forecast is significantly lower than the mid-case AAEE forecast and differs in several critical respects, such as an assumption that there are no future updates to Title 20 and Title 24. Exh. 4051, CEC, Staff Report – California Energy Demand 2016-2026, Revised Electricity Forecast (Jan. 2016), p. 58.

Gleiter first asserted that NRG conducted a "high-level analysis" and determined conversion of Mandalay Units 1 and 2 to synchronous condensers would not result in 240 MVars of reactive power.[26] Yet Ms. Gleiter, who has no engineering background, did not conduct the purported analysis nor provide it for public review, then admitted that NRG engineers "told me that they needed to do a more detailed analysis but from their first-level screening that they're in the magnitudes of the 200, low-200 range. I don't know the exact number."[27] Ms. Gletier's testimony is hearsay that should be accorded no evidentiary weight. But even if conversion of Mandalay Units 1 and 2 could only provide MVars in the "low-200 range," any difference could be made up elsewhere, such as through leveraging the voltage support capability from the inverters on solar and storage resources.[28] In any event, as Scenario 2 assumed construction of a new "stand-alone synchronous condenser" that was "built from the ground up,"[29] the provision of reactive power under Scenario 2 is not dependent on conversion of Mandalay Units 1 and 2. Like the Study's estimates of distributed resource procurement, it is reasonable to assume 240 MVar of reactive power can be supplied in the Moorpark area to meet need identified under Scenario 2.

C. The Cost of Alternative Scenarios is Feasible.

CAISO made clear at evidentiary hearings that it "does not believe that the capital costs identified in the ISO study render the preferred resource alternatives infeasible."[30] As CAISO acknowledged, the cost information in its Study was intended to "provide a starting point for the cost considerations, while recognizing that the preferred resource costs are trending downward

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[26] 9/14/2017 Transcript 275:2-17 (NRG, Gleiter).
[27] 9/14/2017 Transcript 293:17-21 (NRG, Gleiter).
[28] 9/14/2017 Transcript 291-92 (exchange between Mr. Caldwell and Mr. Millar).
[29] 9/14/2017 Transcript 25:18 – 26:4 (CAISO, Millar).
[30] 9/14/2017 Transcript 15:17-19 (CAISO, Millar).

and are reasonably expected to be lower in the future."[31] CAISO determined its cost assessment did not require further refinement because "[w]hen we saw that the costs did not, in our view, render the alternatives infeasible, we stopped."[32]

CAISO's conclusion that its high-level cost assessment did not render identified alternatives infeasible is particularly noteworthy given that its methodology and inputs resulted in significantly higher costs than what would likely result from a resource solicitation. As numerous parties testified, its capital cost assumptions were overstated and capital cost is not an accurate reflection of capacity cost where, as here, distributed resources could access multiple revenue streams. With regard to Scenario 1 and 3, a modified combination of preferred resources than what was assumed by CAISO would substantially lower cost by avoiding the need for 9-hour battery solutions. Finally, NRG's assertion that Ellwood should be assumed retired ignores CAISO authority to maintain resource operations and revisions to the CPUC Ellwood decision that explicitly leave open the possibility of future contracting. Accordingly, resource cost is not an impediment to the feasibility of alternatives to Puente.

1. The CAISO Study's Capital Cost Assumptions for Preferred Resources Are Overstated.

CAISO derived its capital costs estimates for preferred resources from projections in a 2014 study.[33] As stated in an analysis of the CAISO Study by Greentech Media, reliance on projections from 2014 "makes them just about ancient history in terms of the fast-moving storage industry."[34] As several parties testified, more recently available public information shows a

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[31] 9/14/2017 Transcript 15:5-9 (CAISO, Millar).
[32] 9/14/2017 Transcript 76:9-11 (CAISO, Millar).
[33] Exh. 4049, CEC, Consultant Report – San Joaquin Valley Distributed Energy Resource – Regional Assessment, p. 41; 9/14/2017 Transcript 42:13-17.
[34] Exh. 4054, Greentech Media, *In Storage v. Peaker Study, CAISO's Outdated Cost Estimates Produce Higher Price Tag for Storage* (Aug. 31, 2017), p.1.

lower range when projecting capital costs of future deployment. While CAISO assumed an energy storage cost of $485 per kilowatt hour ("kWh"), more recent forward-looking projections of energy storage costs estimate $400 per kWh for deployment in 2018 and $300 per kWh for deployment in 2023, and in the case of a recent Greentech Media analysis, $277 per kWh for installations in 2020.[35] As observed by Mr. Schwartz of Tesla, because of the significant price declines projected for energy storage, when "we're looking at battery systems that are going to be deployed in the 2020-2021 timeframe. It's really important [] that there be … reasonable assumptions around cost reductions."[36] With regard to solar, the study assumes a capital cost of "$2.65 per watt in 2020, when California prices are below $1.50 per watt today."[37] Indeed, even preferred resources procured in the 2013 Moorpark RFO were "very cost effective" and "cost competitive with the Puente project."[38] Since that time, SCE has observed additional price declines in resources bid into subsequent RFOs.[39]

2. Capital Costs Overstate Capacity Costs for Resources that Provide Multiple Grid Services.

While the CAISO study used capital cost estimates, as CAISO acknowledged at evidentiary hearings, "we have to look at the costs that will be ultimately showing up to ratepayers."[40] As SCE stated "it's really the net cost to customers that we focus on. And so, in order to calculate that net cost, there's more that goes into the calculation than just strictly capital

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[35] Exh. 9000, CAISO Study p. 25. The study assigns a cost to energy storage of $1.94 million per MW (4-hour). This translates to $485,000 per MW (1 hour) or $485 per kWh; 9/14/2017 Transcript 183:16-25 (Stem, Owens).
[36] 9/14/2017 Transcript 186:1-5 (Tesla, Schwartz).
[37] Exh. 4054, Greentech Media, *In Storage v. Peaker Study, CAISO's Outdated Cost Estimates Produce Higher Price Tag for Storage* (Aug. 31, 2017) p. 3.
[38] 9/14/2017 Transcript 115:16-19; 119:12 (SCE, Sekhon).
[39] 9/14/2017 Transcript 133:10-11 (SCE, Sekhon).
[40] 9/14/2017 Transcript 46:18-20 (CAISO, Millar).

costs."[41] For resources with multiple value streams, capital costs are "not a good indicator of the capacity costs that Southern California Edison will pay."[42] This is because the "capital cost of the equipment doesn't necessarily need to be recovered entirely by the payments for an individual service. Those costs can be recovered through payments for other services."[43] Because behind-the-meter storage "is able to provide multiple services and value streams – including, for example, demand charge mitigation, demand response, and potentially ancillary and energy consumption services," the price of capacity services provided to the utility can be significantly lower than the capital cost of the system.[44] This is not theoretical. Stem was awarded contracts to provide 78 MW of capacity in the LA Basin RFO and was able to offer a reduced price for capacity because of additional revenue derived from demand charge management for its customers.[45] Development of additional value streams, such as from a product proposed by CAISO to compensate storage for charging during over-generation periods, would lower capacity costs still further.[46] Accordingly, while the Study's use of capital costs "is appropriate for Puente, it totally ignores the significant system value of the batteries and preferred resources during the hours that Moorpark area loads are below the voltage stability limit and they are freed to earn other revenue."[47]

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[41] 9/14/2017 Transcript 122:2-6 (SCE, Sekhon).
[42] 9/14/2017 Transcript 184:13-14 (Stem, Owens).
[43] 9/14/2017 Transcript 186:10-14 (Tesla, Schwartz).
[44] Exh. 4046, Matt Owens Testimony re CAISO Study; *see also* Exh. 4045, Damon Franz Testimony re CAISO Study, p. 2.
[45] Exh. 4046, Owens Testimony; 9/14/2017 Transcript 249:12-250:5 (Stem, Owens).
[46] 9/14/2017 Transcript 184:23-185:5 (Stem, Owens); *see also* CAISO, Briefing on Proposed Load Shifting Product, http://www.caiso.com/Documents/Briefing_ProposedLoadShiftProduct_ESDERInitiative-Presentation-Sep2017.pdf.
[47] Exh. 3090, Caldwell Testimony in Response to CAISO Report, p. 5.

In addition, use of energy storage to meet Moorpark area need would also contribute to SCE's storage procurement mandates. SCE has approximately 265 MW of required additional storage procurement to meet its share of the 1,325 MW storage mandate resulting from the CPUC's implementation of AB 2514.[48] Similarly, AB 2868 authorizes SCE to procure an additional 500 MW of energy storage, with a prioritization in deployment in disadvantaged communities like Oxnard.[49] Energy storage procurement under the CAISO Study is therefore much more cost effective than indicated because the storage procurement would not only contribute to meeting Moorpark area need, but are expenditures SCE would have incurred elsewhere to meet its storage procurement obligations.

3. A Different Combination of Preferred Resources Would Substantially Lower Cost of Scenarios 1 and 3 By Avoiding the Need for 9-Hour Batteries.

The costs of Scenarios 1 and 3 are largely driven by the exclusive use of in-front-of-meter ("IFOM") batteries to meet remaining reliability need. CAISO relied on 9-hour batteries because its modelling showed a handful of hours with a resource deficiency when only 4-hour batteries were assumed.[50] The shift from 4-hour to 9-hour batteries functioned to dramatically increase the cost of Scenarios 1 and 3. CAISO's all-battery approach "is quite possibly the most expensive conceivable way to meet" reliability need.[51] This is because there are no "resources provided during the [contingency] event, that is, during the peak load hours, to recharge the batteries ….[s]o if you have a nine-hour duration event, you have to store all of the energy you're going to require over the next nine hours in the battery before you start."[52] Additional

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[48] 9/14/2017 Transcript 187:3-17 (Tesla, Schwartz).
[49] 9/14/2017 Transcript 187:24-188:15 (Tesla, Schwartz).
[50] Exh. 9000, CAISO Study, pp. 19-20.
[51] Exh. 7034, Supplemental Testimony of Dr. Doug Karpa re CAISO Study, p. 3.
[52] 9/14/2017 Transcript 194:15-18 (City of Oxnard, Caldwell).

procurement of energy efficiency, none of which is assumed in CAISO's scenarios, solar and demand response "allows you to significantly reduce the amount of batteries required."[53] Thus, as modelled by Dr. Karpa, additional solar deployment, coupled with substantially less energy storage, could meet the entirety of Moorpark area need at a lower cost than Puente.[54]

Notably, CAISO did not seek to optimize its Scenarios from a cost perspective because it "consider[ed] further attempts to optimize at this point unnecessary to demonstrate the feasibility of preferred resource alternatives to meet that need and beyond the scope of the proceeding."[55] As CAISO acknowledged, "there is a large range of combinations of resources that could work together to meet the need."[56] Were SCE to issue a new RFO for the Moorpark area, SCE would select the most cost-effective suite of resources and, as has occurred in past RFOs, consult with CAISO as part of the RFO selection process to ensure procurement of a portfolio of resources that meet local reliability need.[57] Because other combinations or resources can offer significantly better overall value by avoiding procurement of 9-hour duration batteries, CAISO's Scenario 1 and 3 cost estimates are highly likely to be inflated when compared to the suite of resources procured through an RFO.

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[53] 9/14/2017 Transcript 194:24-25 (City of Oxnard, Caldwell).
[54] Exh. 7034, Testimony of Doug Karpa re: CAISO Study, p. 8.
[55] 9/14/2017 Transcript 16:7-10 (CAISO, Millar).
[56] 9/14/2017 Transcript 16:4-6 (CAISO, Millar).
[57] Exh. 7016, SCE, Testimony of SCE on the Results of its 2013 Local Capacity Requirements Request for Offers (LCR RFO) for the Western LA Basin (Nov. 21, 2014), pp. 27-28 (SCE describing consultation with CAISO in LA Basin RFO to ensure potential portfolios of resources based off indicative offers could meet local reliability need).

4. NRG's Assertion that the Commission Must Assume Ellwood Will Retire Ignores CAISO Authority to Maintain Resource Operations and Relies on a Superseded CPUC Proposed Decision.

Scenario 3 is significantly higher in cost because it assumes the retirement of the 54 MW Ellwood peaker plant and, as set forth above, that energy storage is the only replacement resource. It is not reasonable to assume the retirement of Ellwood in determining the feasibility of CAISO's alternative scenarios. First, CAISO has the authority to keep a resource in operation if it determines it is needed for grid reliability.[58] If Puente is not approved and CAISO determines Ellwood is needed to meet local reliability need, it can ensure Ellwood continues to be contracted with until such time as replacement resources are deployed. Second, Mr. Theaker's assertion that a proposed decision ("PD") at the CPUC rejecting a refurbishment contract with Ellwood signals that "Ellwood would not be refurbished and therefore would not remain in operation much longer" misleadingly relies on an old version of the PD that has long been superseded by subsequent revisions.[59] Mr. Theaker attached to his testimony the PD first issued in April 2017.[60] As NRG is no doubt aware given it is a party to the CPUC proceeding and the PD addresses an NRG resource, the PD has been revised several times. It is the PD with the latest set of revisions that was before the CPUC at the time Mr. Theaker filed his testimony and what was approved by the CPUC at its September 28, 2017 voting meeting.[61] While the CPUC's Ellwood Decision continues to reject the Ellwood contract, it now directs SCE "to determine whether any identified need can be met in a manner more consistent with the

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[58] 9/14/2017 Transcript 72:7-11 (CAISO, Millar) ("there is a review before a facility retires and we do have mechanisms to seek to retain that facility"); *see also* CAISO Tariff §43A, https://www.caiso.com/Documents/Section43A_CapacityProcurementMechanism_asof_Sep25_2016.pdf.
[59] 9/14/2017 Transcript 217:7-19 (NRG, Theaker).
[60] Exh. 1151, Theaker Testimony in Response to CAISO Study, Exh. A.
[61] *See* CPUC, Public Agenda 3405, Thursday September 28, 2017, Item 26 (containing link to Ellwood Decision), http://docs.cpuc.ca.gov/publisheddocs/published/g000/m195/k925/195925888.pdf.

Commission's goals of reduced reliance on fossil fuel. SCE may identify scenarios *that include Ellwood as part of a solution.*"[62] Unlike the original PD, the Ellwood Decision now also specifically finds that "SCE is not precluded from seeking Commission approval for a contract with NRG or Ellwood in the future."[63] Given CAISO's ability to keep Ellwood operational and the CPUC's revised decision allowing for future contracting with Ellwood if needed, there is no merit to NRG's assertion that CAISO Scenarios that assume continued operation of Ellwood are not viable.[64]

D. The Alternative Scenarios Meet the Established Reliability Need for the Moorpark Area and Provide Reliability Advantages Over Puente.

1. Scenario 2 Meets CAISO Reliability Standards.

NRG's assertion that Scenario 2 should be rejected because load shedding may be needed following an N-1-1 contingency does not withstand scrutiny. Load shedding is permissible under CAISO's planning standards, a very remote risk, and would also potentially be needed were Puente operational. Moreover, any purported reliability benefits of Puente are speculative and would diminish over Puente's lifetime as preferred resources are increasingly deployed to meet California's aggressive greenhouse gas reduction objectives. Scenario 2 is a prudent and feasible alternative to Puente that ensures an adequate level of reliability for the Moorpark area.

CAISO determines local need by adherence to "NERC, WECC, and ISO transmission planning standards as well as the local capacity technical study criteria set out in the ISO tariff to ensure adequate local area reliability."[65] As CAISO made clear, Scenario 2 meets these planning

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[62] Exh. 4056, CPUC Moorpark Phase 2 PD Rev. 3, p. 2 (emphasis added).
[63] Exh. 4056, CPUC Moorpark Phase 2 PD Rev. 3, p. 26, Conclusion of Law 11.
[64] Exh. 1151, Theaker Testimony in Response to CAISO Study, p. 10:16.
[65] Exh. 9000, CAISO Study, pp. 1-2 (footnote omitted).

standards.[66] Accordingly, Mr. Theaker's reliance on CAISO planning standards to assert that "CAISO's reliability criteria do not allow the use of load shedding in dense urban areas" is inapposite and misleading.[67] Under CAISO Planning Standards, urban areas refer to "urbanized areas which contain over one million persons" and do not include a single community in the Moorpark local area.[68] Yet Mr. Theaker continued to repeat this incorrect characterization at hearings, stating that load shedding "is not a long-term solution," with CAISO repeating yet again that load shedding is permitted under the applicable reliability standards.[69] The record is clear that Scenario 2 ensures "adequate local area reliability" established under NERC, WECC and ISO standards, and therefore meets the same identified need as Puente while avoiding its many significant impacts. It is not for this Commission to issue override findings in order to meet reliability criteria that exceed the planning standards established by the national, regional and California entities charged with ensuring grid reliability.

In any event, the purported reliability benefit of Puente as compared to Scenario 2 is far too remote and speculative to merit a finding that Scenario 2 is an infeasible alternative. As CAISO explained, the reason load shedding is permitted following an N-1-1 contingency is because it is "a localized issue" that would only occur under "relatively extreme, relatively infrequent planning events."[70] Unlike voltage collapse, because thermal overload is not instantaneous, load shedding need only occur *after* an N-1-1 contingency. In this case, this means there is only a potential for load shedding in the event of an outage of the Moorpark-

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[66] 9/14/2017 Transcript 13:13-15 (CAISO stating "[t]hese alternatives meet the relevant mandatory planning standards the ISO considers in our studies of grid reliability."); Exh. 9000, CAISO Study, p. 2.
[67] Exh. 1151, Theaker Testimony in Response to CAISO Study, p. 6:11.
[68] Exh. 3091, CAISO ISO Planning Standards, p. 16 (listing qualifying communities).
[69] 9/14/2017 Transcript 220: 11 (NRG, Theaker), 282:12-23 (CAISO, Millar).
[70] 9/14/2017 Transcript 85:13-16 (CAISO, Millar).

Pardee #3 230 kV line, followed by the loss of the Moorpark-Pardee #1 and #2 230 kV lines.[71] CAISO was unable to recall a single instance where all three Moorpark-Pardee lines were simultaneously out-of-service.[72]

Even if all three Moorpark-Pardee transmission lines were to go out-of-service, load shedding would only be needed in the event demand exceeds the import capability of the remaining transmission lines into the Moorpark area and need supplied by in-basin resources.[73] Then, if demand at the time of an N-1-1 contingency was high enough to require load shedding, it would only be to the extent needed to reduce demand to below the combined import capability and in-basin resource supply. While CAISO did not evaluate the total hours and degree of load shedding that would be necessary were all three Moorpark-Pardee lines to go out of service, past seasonal load curves for the Moorpark area show much lower demand in winter, spring, and most fall hours than during summer peak periods, indicating there are many times of year where an N-1-1 contingency could occur without the need for any load shedding.[74] As CAISO confirmed, a "higher load level" is required "for the load shedding to be a risk."[75]

Even were this extremely unlikely set of events to occur, any benefit from Puente is only incremental and likely temporary when compared with Scenario 2. The difference in the degree of potential load shedding between Puente and Scenario 2 is roughly 130 MW (the difference

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[71] Exh. 9000, CAISO Study, p. 5 (describing contingency).
[72] 9/14/2017 Transcript 281:21-25 (CAISO, Millar).
[73] In the event of loss of all three Moorpark-Pardee kV lines, Figure 2-1 of the CAISO Study indicates two 230 kV transmission lines from Pardee to the Santa Clara substation would be available to import power into the Moorpark sub-area. Exh. 9000, CAISO Study, p. 5.
[74] Exh. 4053, CAISO, Consideration of Alternatives to Transmission or Conventional Generation to Address Local Needs in the Transmission Planning Process (Sept. 4, 2013), p. 18. While this document is from 2013, the CEC projects slight year-over-year declines in peak load in the Big Creek/Ventura area. Exh. 4050, Form 1.5d - Statewide - California Energy Demand Update Forecast, 2016 - 2027, Mid Demand Baseline Case, Low AAEE Savings.
[75] 9/14/2017 Transcript 34:14-15 (CAISO, Millar).

between the 262 MW Puente facility and the 135 MW provided in the Scenario 2 base case).[76] This incremental benefit will likely quickly diminish. It is reasonable to expect continued preferred resource penetration in the Moorpark area as costs continue to decline and California moves to meet its aggressive decarbonization goals. Additional deployment, such as through the required doubling of energy efficiency under SB 350 and additional energy storage procurement authorization under AB 2868, will further increase resiliency in the Moorpark area over time and "reduce the exposure to the amount of load shed and also somewhat reduce the time that you would be exposed." [77]

Finally, Mr. Theaker's invocation of the September 1st heatwave to justify Puente is belied by Moorpark area load data. Mr. Theaker argued that "[w]hat we saw on September the 1st was completely unanticipated, blew though the one-in-ten expectation."[78] Yet peak demand in the Moorpark area on September 1st was 1596 MW, almost 130 MW *less* than the 1723 MW 1-in-10 Moorpark area peak demand assumed in the CAISO Study.[79] Moreover, the CEC demand forecast projects declining year-over-year 1-in-10 peak demand in the Big Creek Ventura local capacity area through 2027.[80] Not only are Mr. Theaker's concerns without merit, but the discrepancy between actual load data during a heatwave that "blew though the one-in-ten expectation" and the 1-in-10 demand projection used in the CAISO Study raise serious concerns over whether the need for Puente is premised on inflated projections of future demand.

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[76] 9/14/2017 Transcript 284:17-23 (CAISO, Millar). Like Scenario 2, Puente is also insufficient to avoid load shedding were an N-1-1 contingency to occur during high demand periods. *Id.* 284:11-15 (CAISO, Millar).
[77] 9/14/2017 Transcript 283:13-24 (CAISO, Millar)
[78] 9/14/2017 Transcript 339:20-23 (NRG, Theaker).
[79] TN 221327, CAISO Load Data for Moorpark Subarea; Exh. 9000, CAISO Study p.11.
[80] Exh. 4050, CEC 1-in-10 Mid-Case Low AAEE Demand Forecast. The Moorpark subarea is within the Big Creek Ventura local capacity area.

2. Puente Has Its Own Set of Reliability Risks When Compared to Distributed Resource Solutions.

NRG makes several unsupported statements regarding the reliability of preferred resources while ignoring reliability concerns of centralized gas-powered generation. For example, Mr. Theaker raised concerns of demand response "fatigue" yet was unable to cite to a single study supporting his assertion and denied any such fatigue occurred with NRG demand response programs.[81] Especially given that CAISO recognizes demand response as a local capacity resource and its Study finds it can contribute meeting Moorpark area need in lieu of Puente, Mr. Theaker's unsupported claims should be given no weight.[82] Mr. Theaker raised similar inchoate concerns about the availability of energy storage. Yet as Mr. Owens stated, Stem's behind-the-meter storage solutions use adaptive software to ensure resource availability to meet utility capacity requirements, are "responsive within 20 minutes … available year round, all weekdays" and are "meeting the requirements of the [local capacity] program with Southern California Edison."[83]

As Mr. Caldwell testified:

> There are issues with all resources. And we cannot sit here and say that the gas is perfect and this is the way it is and they're certain and they're known, and then go through all of the horribles about all the other things, when it's really the other way around, that all of the resiliency of the preferred resources is the diversity in the technology, the diversity in the customers, the diversity in the people. And so you always get a response. That's what you're looking for.[84]

In addition to regional issues impacting gas plant operations, such as the closure of Aliso Canyon and past weather events such as the polar vortex, given Puente's vulnerability to coastal flooding,

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[81] 9/14/2017 Transcript 216:5-6, 332:10-24 (NRG, Theaker).
[82] 9/14/2017 Transcript 285:3-10 (CAISO, Millar).
[83] 9/14/2017 Transcript 170:8-21, 172:1-8 (Stem, Owens).
[84] 9/14/2017 Transcript 317:11-21 (City of Oxnard, Caldwell).

meeting reliability need with a single large turbine, especially one sited in an environmental hazard area, only places the larger subarea at further risk of another contingency event. In contrast, the distributed resource alternatives identified by CAISO provided added grid resiliency because "if any single systems goes down it doesn't affect our ability to deliver very much to the utility."[85] Especially as we enter an era of extreme weather events, the distributed resource alternative identified in the CAISO Study offer substantial reliability advantages over Puente.

E. There Are Numerous Pathways to Maintain Grid Reliability While Preferred Resource and Reactive Power Alternatives Are Deployed.

1. Mandalay Unit 3 Can Provide Local Capacity Until Alternative Resources Are Fully Deployed.

The CAISO study found that "continued operation of the Mandalay [Unit 3] plant would offset other needs by 130 MW, whether as a long-term or bridging means while other resources are being acquired."[86] The 130 MW of capacity provided by Mandalay 3 represents virtually the entirety of the incremental distributed resource procurement assumed in the CAISO Study or alternatively, the capacity from the IFOM energy storage assumed in Scenario 1.[87] Mandalay 3 is not subject to a retirement deadline. NRG has admitted that "it intends to continue operation of this unit as future market conditions allow. There is no looming regulation that affects MGS Unit 3's permitted operations. With continued maintenance, MGS Unit 3 will be capable of operating well into the future."[88] Like Ellwood, CAISO has the authority to ensure Mandalay 3

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[85] 9/14/2017 Transcript 174:4-6 (Stem, Owens).
[86] Exh. 9000, CAISO Study p. 26.
[87] Exh. 9000, CAISO Study p. 22. Because Scenario 2 proposed a reactive power solution in lieu of IFOM energy storage assumed in Scenario 1, Mandalay Unit 3 could also serve as a temporary bridge for reactive power solutions to come on-line.
[88] Exh. 1092, Applicant's Responses to Robert Sarvey's Data Request, Set 2, Q 2; *see also* Exh. 4056, CPUC Moorpark Phase 2 PD Rev 3 p. 25, Finding of Fact 22 ("record indicates that continued operation [of Mandalay 3] is possible.")

remains operational should it be needed to maintain grid reliability.[89] Accordingly, continued operation of Mandalay 3 should be assumed as a bridge solution to allow any needed additional time for deployment of alternatives to Puente.

2. There are Multiple Vehicles for Timely Procurement of Preferred Resources in the Moorpark Area.

a) Existing "Slow" Demand Response in the Moorpark Area Can Be Quickly Enabled to Meet Local Capacity Need.

As SCE and CAISO both testified, a small amount of battery storage, such as through the addition of energy storage to enhance operations of the McGrath peaker, can enable slow demand response to meet local capacity, providing large potential value through a small investment.[90] As SCE explained:

> [Y]ou could deploy [] a small battery unit that takes on that initial response that you would expect from the DR, for the first 10 to 15 minutes … because the DR's going to come online in 30. So, that 10 minute gap just sort of close[s] out. So, you can have that battery provide that instantaneous reduction in load while the other DR, the slow DR is called upon. And once that's all up and running you've got your total megawatts.[91]

There is already at least 30 MW of slow demand response in the Moorpark area.[92] Accordingly, 30 MW of additional local capacity can be available with a minimum amount of additional energy storage, such as through enhancements to the McGrath peaker or a small amount of standalone storage deployment.

b) Solicitations for New Resources Are Already Occurring in the Moorpark Area.

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[89] 9/14/2017 Transcript 72:7-11 (CAISO, Millar).
[90] 9/14/2017 Transcript 139:11-25 (SCE, Sekhon).
[91] 9/14/2017 Transcript 142:11-20 (SCE, Sekhon); *see also id.* 24:15-19 (CAISO, Millar) ("a small amount of energy storage to bridge the time frame between the performance that's required and what …the performance expectation currently is for demand response resources.").
[92] 9/14/2017 Transcript 24:23-25:2 (CAISO, Millar).

In addition to existing slow demand response, several solicitations are already in progress in the Moorpark area. A new RFO would therefore not be needed to meet the entirety of remaining Moorpark area need. As SCE testified, SCE conducted a recent energy storage solicitation that targeted the Goleta area and for which SCE is about to submit an application for resource approval to the CPUC.[93] Resources procured under this solicitation would be to provide local capacity.[94] SCE also launched a Goleta RFO open to a range of resources and for which it has already received indicative offers.[95] SCE also has an energy storage distribution deferral ("ESDD") RFO, for which Goleta was also targeted and for which SCE received offers.[96] Because Goleta is within the Moorpark subarea, capacity resources procured in Goleta count toward meeting Moorpark area local capacity need.[97]

SCE's Goleta RFO was intended to address a 50 MW shortfall in a localized N-2 contingency in the Goleta area.[98] SCE suspended the Goleta pending a final CPUC decision on the Moorpark PD. However, the revised PD before the CPUC allows for further procurement and requires SCE to report to the CPUC within six months on "efforts, actions, and resources under review to address" resiliency needs in the Goleta area.[99] Because the PD was approved at the CPUC's September 28th Voting Meeting, procurement of additional resources in Goleta will

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[93] 9/14/2017 Transcript 144:4-11 (SCE, Sekhon).
[94] Exh. 4006, A.14-11-016, Application of SCE for Approval of the Results of its 2013 Local Capacity Requirements Request for Offers for the Moorpark Sub-Area, Phase 2 Transcript, Nov. 1, 2016, p. 981:9-14 (SCE, Sekhon) ("The energy storage RFO that we outlined for 2016 in our storage procurement plan that was filed with the Commission outlined that we would be seeking resource adequacy products up to 20 megawatts.").
[95] 9/14/2017 Transcript 143:7-22 (SCE, Sekhon).
[96] 9/14/2017 Transcript 143:23-25 (SCE, Sekhon).
[97] Exh. 4006, A.14-11-016, Application of SCE for Approval of Results of 2013 Moorpark RFO, Phase 2 Transcript, Nov. 1, 2016, p. 982:2-11 (SCE, Sekhon).
[98] Exh. 4056, CPUC Moorpark Phase 2 PD Rev. 3, p. 10 (without Ellwood, the identified shortfall is 105 MW).
[99] Exh. 4056, CPUC Moorpark Phase 2 PD Rev. 3, pp. 2, 21.

now be reinitiated. While resources procured to meet the unique resiliency needs in Goleta may have differing attributes than a capacity resource such that they do not provide local capacity on a MW-to-MW basis, SCE testified that "we would want to have those [capacity] requirements so that we could make sure that we are getting the most value out of those assets. If you don't have those requirements and you can't check into the [resource adequacy] value and so the DERs will look more expensive."[100] It is reasonable to expect a significant fraction of resources procured under the Goleta RFO to also provide local capacity, particularly were Puente denied and substitute capacity resources needed.

SCE has other ongoing procurement mechanisms in addition to RFOs to meet capacity needs in the Moorpark area. The Demand Response Auction Mechanism ("DRAM") allows demand response resources to participate in the CAISO market and contribute toward utility capacity requirements.[101] In the latest round of DRAM, over 200 MW of demand response projects were picked up, with 2018 and 2019 delivery dates – just one and two years from their solicitation.[102] The success of the DRAM demonstrates "the timeliness with which these projects can come to fruition and begin delivering [] benefits to customers."[103] In addition, because the CAISO Study uses a low-mid AAEE forecast and does not account for the required cumulative doubling of energy efficiency under SB 350,[104] there is likely significant unaccounted for energy efficiency potential in the Moorpark area that can be realized through SCE's energy efficiency programs.

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[100] 9/14/2017 Transcript 129:1-10 (SCE, Sekhon); Exh. 4006, A.14-11-016, Application of SCE for Approval of Results of 2013 Moorpark RFO, Phase 2 Transcript, Nov. 1, 2016, p. 980:10-18 (SCE, Sekhon).
[101] 9/14/2017 Transcript 174:8-11 (Stem, Owens).
[102] 9/14/2017 Transcript 177:5-24 (Telsa, Schwartz).
[103] 9/14/2017 Transcript 177:13-15 (Telsa, Schwartz).
[104] 9/14/2017 Transcript 52:13-17, 55:12-18 (CAISO, Millar).

c) A New Moorpark RFO Can Timely Procure Remaining Resource Needs.

The six-month timeframe from solicitation to successful deployment of IFOM energy storage projects by three separate companies in response to the Aliso Canyon disaster demonstrate the speed with which energy storage resources can be deployed.[105] As Mr. Schwartz of Tesla testified, its 20 MW, 80 MWh storage project "came online … basically from the day we broke ground to actually being commissioned by the CAISO within three months."[106] While SCE observed these storage projects had several advantages that facilitated the speed of their deployment, it is over three years until the current December 31, 2020 once-through-cooling ("OTC") retirement date for Ormond Beach and Mandalay Units 1 and 2.

Parties have noted the importance of further consultation with CAISO to ensure the resources selected from an RFO optimize cost-effectiveness while collectively serving to meet local area need. Consultation with CAISO on resource selection to meet local capacity is already built into the existing Local Capacity Requirements ("LCR") RFO process. SCE has historically consulted with CAISO before finalizing resource selection to ensure CAISO will recognize the resource's capacity value and effectiveness so that the resource will actually provide ratepayer value. Thus, as part of SCE's LA Basin LCR RFO, SCE provided CAISO with resource portfolios "based on resource characteristics of the indicative offers submitted to SCE in the LCR RFO" for feedback on resource effectiveness.[107] Accordingly, determining optimal

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[105] 9/14/2017 Transcript 176:17-177:4 (Telsa, Schwartz).
[106] 9/14/2017 Transcript 176:21-23 (Telsa, Schwartz). While Scenario 2 did not assume IFOM storage deployment, it would meet the same reliability needs and could substitute for distributed resources assumed in the Scenario 2 base case.
[107] Exh. 7016, SCE, Testimony of SCE on Requests of its LCR RFO for the Western LA Basin (Nov. 2015), pp. 27-28.

resource selection among indicative offers in a Moorpark RFO to cost-effectively meet remaining local capacity need will not result in additional delay in procurement.

3. Reactive Power Can Be Timely Deployed.

Scenario 3 of the CAISO Study found that 240 MVar of reactive power coupled with 135 MW of distributed energy resource meet local reliability need. Synchronous condensers that can supply significant amounts of reactive power are considered a transmission asset and have a straightforward deployment process. They are approved by CAISO and its annual Transmission Plan and "the utility which the condenser is sited typically builds them within one of their substations."[108] While the CAISO Study assumed deployment of a new synchronous condenser, reactive support can also be provided by converting Mandalay Units 1 and 2 to synchronous condensers. CAISO noted that past conversions, such as with Huntington Beach units following the closure of the San Onofre Nuclear Generating Station were "done very quickly."[109]

4. An Extension of Once-Through-Cooling Retirement Dates is Equally Likely for Puente and Not a Basis to Find Alternative Resource Solutions Infeasible.

The potential for delay in the scheduled December 31, 2020 OTC retirement date for the Ormond Beach and Mandalay Units 1 and 2 is not a legitimate basis to find that the CAISO Study's alternative scenarios are infeasible. First, as set forth above, the need for postponement of OTC retirement dates is highly unlikely, especially given Mandalay Unit 3 can serve as a bridge until full deployment of a preferred resource/reactive power alternative. Second, the possibility of an OTC extension is no more likely to realize a preferred resource alternative than it is for Puente. Unlike energy storage resources which can be deployed within three months of

[108] 9/14/2017 Transcript 145:7-9 (SCE, Chinn).
[109] 9/14/2017 Transcript 27:8-10 (CAISO, Millar).

contracting, NRG has testified it needs 28 to 30 months from a final non-appealable decision before Puente is operational.[110] The CPUC decision approving the Puente contract is currently on appeal, this Commission's approval of Puente is subject to judicial review, and Puente's air permit may be appealed. Accordingly, Puente's operation prior to the OTC retirement dates is far from certain. Indeed, NRG's assertions that Puente is the only available resource that can be deployed to avoid an OTC extension is the same bait-and-switch used before the CPUC to rush approval of Carlsbad and avoid competition from preferred resource alternatives.[111] Yet Carlsbad was not timely deployed and the Water Board recently granted an extension to the Encina OTC facility to "ensure reliability in the area, due to the delay of [] service of the Carlsbad facility."[112] As an OTC extension was recently granted to accommodate a gas plant, it can certainly be granted to accommodate deployment of non-polluting resources that will avoid a new long-term commitment to industrialized development on a coastal area at risk of flooding and sea level rise.

III. CONCLUSION

As set forth above, preferred resource and reactive power alternatives to Puente meet CAISO's reliability criteria, are cost-competitive, and can be timely deployed, especially given the availability of bridge solutions such as continued temporary contracting of Mandalay Unit 3. Because there are feasible alternatives that avoid Puente's many impacts, Puente cannot be lawfully approved.

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[110] TN 217520, Transcript of 4/28/17 Committee Conference 37:16-22 (NRG, Gleiter).
[111] CPUC, A.14-07-009, Application of SDG&E for Authority to Partially Fill the Local Capacity Requirement Need Identified in D.14-03-004 and Enter into a PPTA with Carlsbad Energy Center, LLC, Opening Br. Carlsbad Energy Center LLC (an NRG subsidiary), p. 19 ("Carlsbad Energy Center is the only project of sufficient size and technology that can be built and operating in time to meet reliability needs in 2018."), http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M143/K565/143565441.PDF.
[112] 9/13/17 Transcript 35:9-25 (CAISO, Millar).

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