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Attached find a copy of Californians for Green Nuclear Power, Inc.'s (CGNP's) accepted Reply Brief in CPUC Application A.16-08-006 by Pacific Gas and Electric (PG&E) to abandon the safe, efficient, cost-effective and reliable Diablo Canyon Power Plant (DCPP) in 2025. CGNP, as a CPUC Intervenor requests proper notice by the California Energy Commission (CEC) of CGNP's Reply Brief with particular attention directed to the logical conclusion on page 12 of 22 .... As shown below, this leaves nuclear as the reliable base-load resource. Also as shown below, a troubling aspect about the testimony submitted in this proceeding by PG&E is how it conflicts with other sworn testimony PG&E submitted to the Commission in another recent proceeding. The inescapable conclusion is that one set of the testimony submitted by PG&E is false.... In summary, CGNP supports the continued safe operation of DCPP far beyond PG&E's proposed abandonment date of 2025. CGNP further requests that any CEC requests for information or clarification be sent to the contact email address shown in the document. CGNP expects substantial revision of the upcoming CEC IEPR to reflect CGNP's fact-based perspectives.

*Additional submitted attachment is included below.*
BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA


Application: No. 16-08-006
(Filed: 08/11/2016)

REPLY BRIEF OF
CALIFORNIANS FOR GREEN NUCLEAR POWER

June 16, 2017

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. INTRODUCTION AND SUMMARY OF RECOMMENDATIONS</td>
<td>3</td>
</tr>
<tr>
<td>II. ARGUMENT</td>
<td>5</td>
</tr>
<tr>
<td>A. PG&amp;E Has Still Not Met Its Burden of Proof.</td>
<td>5</td>
</tr>
<tr>
<td>B. Shuttering Diablo Will Hurt the Environment, and PG&amp;E’s</td>
<td>7</td>
</tr>
<tr>
<td>Claims to the Contrary Are Not Credible.</td>
<td>7</td>
</tr>
<tr>
<td>C. Shuttering Diablo Will Result in Unreasonable Charges to Ratepayers,</td>
<td>9</td>
</tr>
<tr>
<td>and the Commission Should Be Wary of Strange Bedfellows Claiming</td>
<td>9</td>
</tr>
<tr>
<td>Otherwise.</td>
<td>9</td>
</tr>
<tr>
<td>D. Diablo Is a Critical Base-Load Resource, and PG&amp;E</td>
<td>12</td>
</tr>
<tr>
<td>Has Not Identified Alternatives.</td>
<td>12</td>
</tr>
<tr>
<td>E. PG&amp;E’s Estimates of Future Operating Costs for Diablo</td>
<td>18</td>
</tr>
<tr>
<td>Are Not Credible.</td>
<td>18</td>
</tr>
<tr>
<td>III. CONCLUSION</td>
<td>21</td>
</tr>
</tbody>
</table>

# TABLE OF AUTHORITIES

## STATUTES

<table>
<thead>
<tr>
<th>Statute</th>
<th>Page</th>
</tr>
</thead>
</table>
I. INTRODUCTION AND SUMMARY OF RECOMMENDATIONS

The science is inescapable. Closing the Diablo Canyon Power Plant (Diablo) will result in 6 to 7 million additional tons of GHG emissions per year, generated by substitute base-load sources. This tragic statistic should be enough to doom this Application. The Aliso Canyon gas leak is barely a year in the history books, a leak that belched into the California sky the GHG emissions equivalent to between 1.4 – 4.5 million cars. Shockingly, the California Public Utilities Commission is considering an Application by another gas company that would result in the emissions equivalent of at least another million cars annually.

The opportunity to do some good should not be lost on the Commission. Its handling of both its inspection-coordination responsibilities and previous applications by the utility responsible for Aliso Canyon were contributory causes to the severity of that leak. Furthermore, the Commission’s (and other policymakers) expansion of reliance on intermittent, non-diverse sources of new power has made California dependent on natural-gas-fired “peaker” plants, which increase the odds, of course, of another Aliso Canyon. In a

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1 CGNP ex-3, pp. 1-3, line 1.


3 "Productive, paid for — and ready to close - The massive La Paloma power plant is in bankruptcy proceedings while the state pushes new construction at ratepayers’ expense," June 11, 2017 by Ivan Penn, The Los Angeles Times. Note in particular Diablo's importance shown in the graphic, "Most Productive Power Plants." In 2016, Diablo produced 60.2% of the total power produced by all of California's top eight natural-gas-fired power plants. http://www.latimes.com/business/la-fi-la-paloma-capacity-20170609-story.html
state that prides itself on respecting science⁴, and a Commission that has taken steps towards
reform, this Application should have been summarily dismissed.

Indeed, the Commission is under several statutory mandates to consider what is best
for the environment. It must work to reduce GHG emissions. And it must do what is best
financially for the ratepayers. Here, Pacific Gas and Electric (PG&E) has not met its burden
of proof to show that the proposed closure of Diablo is in the public interest, or that a decision
on this application should even be made at this time. The record, applicable law, and
Commission policy support CGNP’s recommendation that the Commission reject the PG&E
application, and authorize resumption of Nuclear Regulatory Commission licensing activities
together with other necessary consultations and certifications. Detailed analysis in
Californians for Green Nuclear Power, Inc.’s (CGNP)’s opening brief demonstrates that
continued operation of Diablo is economical throughout the license-renewal period. It also
demonstrates that PG&E will be able to sell “excess” electricity profitably on the wholesale
market, even more profitably than its gas plants.

Diablo is a proven, safe, reliable, cost-effective source of GHG-free electricity, which
will continue to be needed as an important source of base-load generation for the California
Independent System Operator (CAISO). PG&E has not specifically articulated new, reliable
GHG-free sources that can replace Diablo’s output and firm-generating capacity, and
therefore the record is undeveloped on this issue. Moreover, continued operation of Diablo is
cheaper than each of the new GHG-free sources suggested as a replacement.

These simple facts require the Commission to reject this Application.

⁴ "Fighting Trump on Climate, California Becomes a Global Force" May 25, 2017, Page A1 The
New York Times
II. ARGUMENT

A. PG&E Has Still Not Met Its Burden of Proof.

In its Opening Brief, PG&E acknowledged that it has the burden of affirmatively establishing the reasonableness of all aspects of its application, and that it must demonstrate all costs to be recovered are “just and reasonable,” and that the retirement of Diablo and its replacement by GHG-free resources are both “just and reasonable” and “necessary to promote the safety, health, comfort, and convenience” of customers, PG&E employees, and the public. PG&E continues, stating “the standard of proof the applicant must meet is that of a preponderance of the evidence” and the “Evidence Code Section 190 defines “proof” as the establishment by evidence of “a requisite degree of belief.” PG&E’s dwelling on the barest formulation of the standard is telling. But as shown by CGNP’s exhaustive testimony – prepared and submitted by truly independent experts, with decades of experience in their fields – PG&E can’t even meet this preponderance-of-the-evidence standard. California prides itself in following science. The Commission should let the science govern its decision here.

As just one example, PG&E states in its opening brief, that “By 2030, Diablo’s baseload generating profile does not fit the hourly demand profile associated with PG&E’s bundled customers.” PG&E persists in this argument without offering any evidence to rebut the data submitted by CGNP that Diablo has the potential to operate in a more flexible mode. As shown in its testimony, CGNP fully understands the need for NRC licensing and possible plant modifications in order to permit flexible operation, and PG&E acknowledges that it has done technical work examining the issues. But since PG&E has withheld this information and

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5 PG&E Opening Brief, p. 9
7 PG&E Opening Brief, p. 16
has not used any work product to support its claims restricting operation to base-load, the
Commission can only make the inference that said work product actually supports the claims
of flexible operation without exorbitant plant changes and protracted licensing risk. CGNP
supports the continuation of NRC licensing efforts, to quantify the effects to the plant and
their costs, rather than the reliance on PG&E’s apparent business decision to close Diablo.

Furthermore, PG&E agrees that the Diablo license-renewal application would have
passed the NRC’s safety assessment. CGNP has offered testimony that the uncertainties
regarding required state approvals are being exaggerated by the Applicant. PG&E further
states its decision not to relicense Diablo was based on its assessment of the need for the
plant, not cost, and while PG&E evaluated potential costs of operating Diablo beyond 2025,
concerns about cost-effectiveness were not the primary drivers in PG&E’s decision making
process. However, in its cost analysis, it continues to use the arbitrarily inflated once-
through-cooling mitigation cost of $3.5 billion to make continued operation look as
unattractive as possible. CGNP, in its testimony and opening brief presented hard data
showing cost estimates should be significantly lower than PG&E’s.

It should be noted that Mr. Freeman of Friends of the Earth stated, “PG&E has
proposed a lower cost alternative to operating Diablo beyond 2024-25. To suggest that this
Commission should reject the lower cost alternative, one that is pollution free, would violate
the Commission’s just and reasonable standard and be a disservice to consumers.” This
logic should also apply if, in fact, continued operation of Diablo is determined to be the lower
cost alternative when all of the necessary engineering and licensing activities are completed.

It is also not credible to forecast any costs for alternatives to Diablo when the technologies,

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8 PG&E Opening Brief, p. 20
9 Ex, CGNP-1 at p. 93, et. seq.,(Marinak) and CGNP Opening Brief pp.18-34
10 FOE Opening Brief, p. 4
their lifetimes and reliabilities and therefore costs are unknown. While PG&E may de-
emphasize costs in their decision, future costs are important to ratepayers and the Commission
decision.

B. Shuttering Diablo Will Hurt the Environment, and PG&E’s Claims to the
Contrary Are Not Credible.

CGNP has shown that retiring Diablo will significantly increase GHG emissions.\textsuperscript{11} PG&E claims it and the Joint Parties are committed to avoiding this potential outcome by using Tranche #1 and the IRP to replace Diablo with GHG-free resources.\textsuperscript{12} This statement lacks support, as the record shows no credible assurance that there will be 18,000 GWh/year of reliable cost-effective supplies of GHG-free resources at the time of the proposed Diablo closure or any time thereafter. To compensate for the loss of Diablo production would require an oversupply of solar and wind generating resources plus storage capacity to accommodate any potential shortfall from the intermittent generation of the renewables. CGNP has established that it is highly likely that significant shortfalls will occur and that they will require the burning of natural gas.\textsuperscript{13}

ORA recommends that the Commission deny PG&E’s request for customer funding of $1.3 billion for its Tranche 1 Energy Efficiency procurement proposal because PG&E fails to demonstrate that its requested Tranche 1 procurement, which is an increase of more than 50% of the currently-identified energy efficiency potential, would be cost effective.\textsuperscript{14} PG&E notes that ORA and CLECA indicated in their testimonies that they did not believe the 2,000 gross

\textsuperscript{11} Ex. CGNP-1 at pp. 18-19
\textsuperscript{12} PG&E Opening Brief, p. 20
\textsuperscript{13} CGNP-1 pp 130-137
\textsuperscript{14} ORA Opening Brief, p. 10
GWh goal in Tranche #1 was achievable. PG&E also notes that several parties have
proposed consolidating the Tranche #1 proposal with other ongoing Commission proceedings,
such as the IRP or the Business Plan proceeding. Shell Energy North America recommends
that the Commission should reject PG&E’s proposal for “early action” energy efficiency
procurement to replace a portion of the Diablo energy output and direct PG&E to address
electric resource planning and procurement needs for its bundled sales customers (including
any and all “replacement” for Diablo energy and capacity) through the IRP proceeding
(R.16-02-007). In withdrawing its request for Tranches #2 and #3, PG&E agrees to address
replacement resources in an IRP proceeding. Why shouldn't both the Diablo shutdown and
the EE also be considered as part of the IRP proceeding? CGNP opposes the approval by the
Commission of Tranche 1, and supports the deferral of any decision on Diablo operation or
potential closure to the IRP or a new proceeding that provides careful consideration of the
increased costs and adverse environmental consequences that are likely outcomes of a
decision to abandon Diablo.

It is illogical to decide to close Diablo without reasonable assurance that the lost
capacity would be replaced by GHG-free resources. Because some parties have testified that
PG&E claims regarding replacement power are unachievable, it would be imprudent to base
any shutdown decision on the limited information presently available. The possibility that the
other parties are correct and PG&E is wrong appears in the public record. The Commission
runs the risk of looking foolish or vitiated if, just a few years from now, the predictions of
parties like CGNP come true.

15 PG&E Opening Brief, p. 32
16 PG&E Opening Brief, p. 32
17 Shell Energy North America Opening Brief, p. 2
18 PG&E Opening Brief, p. 35
After vigorously rebutting claims of plant aging and vessel embrittlement by CEERT and SLO Mothers for Peace seeking an *early* shutdown of Diablo, PG&E states “Finally, given California’s overarching policy priority for achieving GHG-emissions reductions, it makes no sense to prematurely shut-down Diablo in 2019, well before it can be replaced with GHG-free resources.”¹⁹ This holds equally true for many years beyond 2024-25, until GHG-free resources (especially storage) are assured. If PG&E makes the case that Diablo should be operated until license expiry, why should it not operate until it is clear that it is *not* needed? Diablo's safe and efficient operation since 1984 establishes that a delay of four or five years will harm no one, and that this delay would provide time to obtain better much information on future Diablo operational modes and costs, alternative sources of electricity, while minimizing near-term costs to ratepayers through avoidance of most of the costs requested in this application.

C. **Shuttering Diablo Will Result in Unreasonable Charges to Ratepayers, and the Commission Should Be Wary of Strange Bedfellows Claiming Otherwise.**

For decades, PG&E has battled the efforts of many of the Joint Proposal parties, who sought first to prevent the construction of Diablo and later to hinder its operation. In 2016, these traditional foes joined forces to close Diablo at the end of its current license period. There is no certainty regarding the true reasons for the positions of all parties, but claims of reduction in GHG emissions coupled to the shutdown have certainly not been proven. There is certainty that the shutdown of Diablo if accompanied by Commission approval of the requested Employee Retention and Community Impacts Mitigation Programs (CIMP) will cause increased rates to consumers of PG&E electricity. CGNP has established that both the Employee Retention Program and the CIMP represent unreasonable charges to ratepayers, and

¹⁹ PG&E Opening Brief, p. 22
they should be denied by the Commission. CGNP has presented testimony and a brief in support of its position that those programs should not be funded by the ratepayers.\(^{20}\) If PG&E feels that they are needed, then their costs should be borne by the PG&E stockholders, because closure of Diablo is a wholly voluntary action on the part of PG&E. Additionally, CGNP has provided testimony that the Employee Retention Program is likely not to be needed to maintain Diablo’s operating staff.\(^{21}\)

ORA recommended that customers not be required to fund Tier 1 payments. ORA states “If PG&E chooses to provide these payments then PG&E shareholders should fund them...ORA recommends no customer funding of employee bonuses for the first four years of the (proposed) nine-year period.”\(^{22}\) ORA also states that since PG&E provided no facts to support its conclusion regarding the need for the retention program, or the assumptions that underlie it, its arguments are speculative at best and should be given no weight.\(^{23}\) This is wholly in accord with the CGNP testimony and brief as cited above.

CUE, while attempting to justify the Employee Retention Program, states “We represent 476 employees at Diablo. Of them, 410 (86%) have now signed retention agreements. We believe that fewer than 10 members of our bargaining unit have separated from PG&E since June, meaning an annual turnover of less than 4%.”\(^{24}\) CGNP has previously testified that the 86% only means that workers will accept free money until such times as they may quit. There is no downside to their signing up, and the 86% is no indication that the workers support the shutdown of Diablo. One-on-one discussions with employees indicate that they do not support the shutdown, and Business Manager Dalzell signed the

\(^{20}\) Ex. CGNP-1 at pp. 85-87 and Ex. CGNP-2 at pp. 39-40 and CGNP Opening Brief, pp. 14-17
\(^{21}\) CGNP Opening Brief, p. 14
\(^{22}\) ORA Opening Brief, p. 25
\(^{23}\) ORA Opening Brief, p. 26
\(^{24}\) CUE Opening Brief, p. 13
agreement without the knowledge or approval of his workers. Additionally, the cited 4% turnover in the year since the announcement of the Joint Proposal provides *prima facie* evidence that there is no precipitous loss of personnel from Diablo.

It is also interesting to note that CUE is the first of the Joint Proposal parties to openly state what should be apparent to all, that “The closure of Diablo will create a depression in the surrounding community.” The annual loss to the economy of approximately $1 billion in direct and indirect payrolls will have severe and possibly permanent effects. One should question why this issue has not received more prominence, and why the local jurisdictions have not protested the potential closure more vigorously.

CGNP has provided unrebutted testimony and argument showing why the Commission should not approve the CIMP request. ORA also objects to the CIMP request and states “ORA reviewed PG&E’s proposal and does not support customer funding of the proxy payments. The payments would effectively be a substitute for PG&E’s property taxes. If Diablo’s rate base is declining based the actual depreciation schedule, it is unreasonable to require PG&E’s customers to fund additional payments above the calculated property taxes that are based upon the actual cost of service to operate Diablo.” Furthermore, the absence of a connection between the Applicant's determination of the plant's depreciation schedule driven by its business desires and an engineering-based assessment of the plant's useful lifetime is established by CGNP's written testimony, workpapers, and brief.

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25 Evidentiary Hearing Transcript, page 1325, lines 6-22.
26 CUE Opening Brief, p. 2
27 PG&E-5 Prepared Testimony, Chapter 8 Atch A, p.4, second paragraph.
29 ORA Opening Brief, p. 29
30 CGNP Opening Brief pp. 124-129.
D. Diablo Is a Critical Base-Load Resource, and PG&E Has Not Identified Alternatives.

Diablo is a proven reliable, cost-effective source of GHG-free electricity.\(^3\) It will continue to be needed as an important source of base-load generation for CAISO. Base-load plants form the stable foundation of an electrical grid. Base-load sources – such as nuclear, natural gas and coal – are essential to maintaining the grid’s stable, reliable and economical operation. When asked, “Are you aware of any large electric grid, anywhere in the world that operates without a substantial continual supply of electricity from base-load sources?” PG&E witness Frazier-Hampton, who performed their needs analysis, was unable to identify such a grid anywhere.\(^3\) CGNP (and doubtlessly the Commission) supports eschewing coal and natural gas. As shown below, this leaves nuclear as the reliable base-load resource. Also as shown below, a troubling aspect about the testimony submitted in this proceeding by PG&E is how it conflicts with other sworn testimony PG&E submitted to the Commission in another recent proceeding. The inescapable conclusion is that one set of the testimony submitted by PG&E is false.

Diablo’s capacity is 2.2 GW. Data from CAISO shows that throughout 2017 CAISO’s minimum, workday demand is 8 or 9 times higher.\(^3\) Even on weekends, minimum CAISO Net Load amounts to about 9 GW (over four Diablos). Thus, the minimum baseload demand for CAISO far exceeds the output of Diablo.

PG&E claims that CAISO will experience a reduced need for base-load sources in the future.\(^4\) But its claim has not been demonstrated through the IRP process. More intermittent

\(^{3}\) CGNP Opening Brief, pp. 20, line 3.
\(^{3}\) Transcript, PG&E, Frazier-Hampton, pp. 946, line 6.
\(^{3}\) CGNP Prepared Testimony, p. 60, including the graphic
\(^{4}\) Transcript, PG&E, Malnight, pp. 302, line 24.
Renewable Portfolio Standard sources will be added to the grid suggesting increased need for flexible capacity. But overall electricity demand continues to increase with population, along with new demands such as created by electric vehicles, suggesting increased demand for base-load capacity as well. In fact the actual daily minimum demand for power in the CAISO system far exceeds predictions for 2017 made by CAISO just a few years ago.\textsuperscript{35}

This base-load analysis cannot be divorced from the environmental one. Even if one assumes that CAISO will experience some reduction in the need for base-load capacity, closing zero-GHG emitting Diablo first, among all of CAISO’s base-load sources is indefensible. Under PG&E’s proposal, CAISO would continue to obtain base-load electricity from coal and natural-gas plants. Closing Diablo would result in at least 6 to 7 million tons more GHG emissions per year generated by CAISO base-load sources\textsuperscript{36} compared to that case of continued operation. This would violate the Public Utilities Code which requires “[t]he portfolio shall rely upon zero carbon-emitting resources to the maximum extent reasonable and be designed to achieve any state wide greenhouse gas emissions limit.” See \textit{Cal. Pub. Util. Code} § 454.51(a).

PG&E’s amended testimony requests a directive be issued that GHG-free replacements be used to replace Diablo, to be determined in a future proceeding. Yet PG&E has not demonstrated specific new reliable GHG-free sources that could replace Diablo’s output and firm generating capacity.\textsuperscript{37} As other parties have noted, unless the Commission were to require that newly constructed GHG-free sources be used to replace Diablo output, then the ultimate result would be increased reliance on GHG-emitting sources arising

\textsuperscript{35} CGNP Rebuttal Testimony, pp. 14, line 5.
\textsuperscript{36} CGNP ex-3, pp. 1-3, line 1.
\textsuperscript{37} Transcript, PG&E, Frazier-Hampton, pp. 940, line 20.
elsewhere.\textsuperscript{38} And the net effect would be equivalent to replacing Diablo output with fossil fuels.

In its testimony, PG&E suggested that part of Diablo’s output be replaced by wind and solar sources, in Tranches 2 and 3. As CGNP, science, and experience has shown, solar and wind farms do not increase the capacity of the grid in any meaningful way, because they can never be counted on to produce energy at a particular time when it is needed. Thus, adding any number of new solar or wind sources does not allow one to retire a single power plant from the grid. PG&E confirmed this reality in testimony a few years ago, reporting results of its study that considered in detail the full range of possible replacement sources for Diablo.\textsuperscript{39}

Regarding wind turbines PG&E asserted\textsuperscript{40} Because the power output can only be intermittently generated during the day or during certain seasons, depending on the location, wind turbines are unsuitable for baseload applications (sic) and, therefore, wind generation cannot be considered an adequate replacement of Diablo generation.

During cross examination in this proceeding, PG&E witnesses Strauss and Frazier-Hampton stated that replacing Diablo with PV could actually increase the problem of over-generation.\textsuperscript{41} Hydroelectric power has also been suggested as a possible replacement. But the development of new large hydroelectric sources is limited due to severe environmental concerns and lack of available sites.\textsuperscript{42} No new large hydroelectric dams could be expected to be completed by 2024. For these reasons PG&E concluded, in affirmed 2010 testimony, that

\textsuperscript{38} GPI opening brief, pp. 14, discussion of additionality.
\textsuperscript{39} CGNP ex-4, pp. 7.2-5 – 7.2-6
\textsuperscript{40} CGNP ex-4, pp. 7.2-5.
\textsuperscript{41} Transcript, PG&E, Strauss, pp. 563, line 23; PG&E, Frazier-Hampton, pp. 939, line 24.
\textsuperscript{42} A. 10-01-022, PG&E Prepared Testimony, Volume III, pp. 7.2-7.
“hydroelectric power is not a reasonable alternative to renewal of operating licenses for Diablo.”

Geothermal is unlikely to be available on the scale required to replace Diablo, a conclusion shared in PG&E previous testimony. Biomass is not competitive on a scale required to replace Diablo, as PG&E previously concluded.

Thus, as demonstrated by its own previous testimony, PG&E has not identified new reliable GHG-free sources that could be expected to replace Diablo by 2024. In fact PG&E’s 2010 comprehensive study of possible replacement sources concluded with this strong admonishment:

Based on these evaluations, PG&E determined that the only viable alternative generation technology to replace Diablo power is natural gas-fired generation.

It also warned

PG&E is undertaking every effort to meet the state’s long-term, low-carbon energy requirements. The ability to meet these requirements in the time frame required and at a reasonable cost to PG&E’s customers will be severely handicapped without renewal of Diablo’s operating licenses.

PG&E’s 2010 study also analyzed in detail the costs of 18 potential alternative replacements for Diablo output, including the comprehensive set of GHG-free sources listed above. PG&E concluded that continued operation of Diablo throughout the license renewal period was cheaper by a substantial margin in every case.
PG&E witnesses briefly mentioned storage as a potential solution to the problem of intermittency of most GHG-free sources. But its proposal presents no realistic plan to construct the unprecedented storage systems required. It fails to account for the enormous associated costs, which CGNP estimates at over $73.6 billion for the case of PV replacement including storage. The ability to obtain all the permits required to build multiple new Helms-scale pumped hydro storage projects appears highly doubtful, and the prospects of completing their construction by 2024 even worse. Without enough storage capacity, balancing the inherently unpredictable output of wind and solar requires building dispatchable gas or coal plants, a conclusion reached not only by PG&E, but also demonstrated in refereed journal articles. One example cited by CGNP, a highly relevant, recent study by the Max Planck Institute and the Royal Institute of Technology, published in the European Physical Journal Plus, found that if Sweden’s nuclear plants were replaced with wind power it would make the electrical grid unreliable. It concluded conventional natural gas and coal power plants would be needed to compensate for the unreliability. That would double CO2 emissions.

CGNP has also shown that when the outputs of these fossil-fueled sources are ramped up and down in the manner required to compensate for the erratic, whimsical output of wind turbines, there is a sizable increase in their emissions of greenhouse gasses and air pollution. This effect has been documented in numerous scientific studies, including a study that examined more than 300,000 hourly records of utilities in four regions of the country. These

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50 PG&E Prepared Testimony, pp. 1-2, line 30; Transcript, PG&E, Frazier-Hampton, pp. 940, line 16.
51 CGNP Prepared Testimony, pp. 118, et. seq.
52 CGNP ex-3, pp. 4-4, section 3.
53 CGNP Prepared Testimony, pp. 66, line 19.
54 CGNP Prepared Testimony, pp. 113, line 13, including references mentioned.
increased emissions cancel out at least a substantial fraction of the claimed reduction in GHG emissions associated with the wind turbines. Thus the overall result would be a large net increase in greenhouse gas emissions compared to the zero-GHG emissions achieved with continued operation of Diablo. These increases in emissions will move California farther away from the legislated mandates for reduced GHG emissions.

PG&E testimony implies that the grid would be able to handle any amount of random fluctuations in output caused by any amount of unreliable solar- and wind-generated sources. Real-world experience indicates otherwise. For example, Germany’s wind and solar power systems have provided too much power at unpredictable times, which damaged the power grid and made the system vulnerable to blackouts. Grid operators paid companies $548 million to shutter turbines to fix the problem. Germany will remove 6,000 megawatts of wind capacity by 2019 to restore the stability of its grid. South Australia continues to experience serious problems with blackouts caused by wind power (or its absence). This includes a complete crash of the South Australian grid which the state’s utility blamed on violent fluctuations in output from a wind farm. The blackout is estimated to have cost businesses AUD$367 million.

All of this underscores the necessity of maintaining Diablo as California’s largest reliable, economical, zero-GHG emitting energy source. It establishes CGNP’s conclusion that closing Diablo would cause GHG emissions to increase by many millions of tons annually, compared to its continued operation through the extended license period.

The bottom line is this: surely the Commission is aware that the Legislature is likely to

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55 CGNP Prepared Testimony, pp. 113, line 20.
56 CGNP Prepared Testimony, pp. 37, line 12.
57 CGNP Prepared Testimony, pp. 37, line 20.
58 CGNP Prepared Testimony, pp. 37, line 25.
require an even greater reliance on “100% GHG-free” power sources in the coming years. Yet shuddering Diablo will only increase reliance on natural gas. And from a technical and legal standpoint, the Commission can not approve this application with so many outstanding issues, which PG&E unilaterally succeeded in bifurcating in separate proceedings. This Application must stand on the record, and the record shows that PG&E’s arguments should be rejected.

E. PG&E’s Estimates of Future Operating Costs for Diablo Are Not Credible.

CGNP presented detailed analysis of future operating costs for Diablo that corrected PG&E’s analysis by properly accounted for essential facts. First PG&E claims in the Application that future operating costs for Diablo will escalate dramatically, contradicting its own cost analysis from 2010. This is primarily due to an assumed 25% probability that cooling towers would be required, with estimated costs of up to $13.3 billion. Since there is zero probability that PG&E would actually pay costs to install cooling towers, they must be excluded from calculations of costs that would actually be paid. This principal problem with PG&E’s cost estimate was solved using estimates for once-through cooling mitigation costs for the specific practical options that were discussed as part of the mitigation framework.

CGNP noted testimony of PG&E witnesses indicating that O&M costs are presently increasing at a lower rate than predicted in the model in the application. CGNP demonstrated that PG&E’s 2010 model for O&M costs is a much better fit to data and is defensible with respect to industry trends. The expertise of CGNP witnesses regarding the engineering and economics of nuclear plants makes them especially well qualified to judge the credibility of specific claims regarding costs. Resolving PG&E’s cost estimate

59 CGNP opening brief, pp. 21, line 3.
60 CGNP opening brief, pp. 21, line 12. See also historical details of Diablo's OTC mitigation found in the first four paragraphs on page 43 of PG&E's Form 10-K filing for the U.S. Securities and Exchange Commission for the year ending December 31, 2016.
demonstrated continued operation is economical. Detailed analysis presented by CGNP showed that Diablo will be able to sell electricity profitably on the wholesale market, more so than PG&E’s gas plants.

Several other parties have embraced cost models that greatly overestimate Diablo future operating costs too. TURN, CEERT and FOE have all embraced a common model as the basis of cost estimates in their testimony or rebuttal testimony. It is “A Cost Effective and Reliable Zero Carbon Replacement Strategy for Diablo Power Plant” – “the FOE Report.” The report’s conclusions regarding Diablo violate essential engineering facts regarding the expected service lives of major plant components. Those claims, including ones made in the opening brief by FOE, have been thoroughly rebutted in CGNP Prepared Rebuttal Testimony and CGNP’s opening brief. CGNP’s rebuttal also considers many factors that have the potential to increase substantially the already high cost of electricity obtained from solar or wind projects.

TURN’s opening brief claims that costs of new photovoltaic sources will be lower than the levelized cost of electricity, citing specific contracts at lower prices. But a contract cannot be taken as proof of the revenue required to provide a service. Contracts which lose money are signed every day. The solar energy industry in particular has an appalling record of bankruptcies. Such contracts are not reflective of the actual costs to provide the services described. Additional revenue streams are required. Large taxpayer-funded subsidies form a
substantial part of the required revenue stream. But these subsidies are to be largely
eliminated over the next few years.\textsuperscript{69} Also the contracts cited don’t specify that the PV-
generated electricity will only be available for use during a few hours each day, centered
around noon. Nor do they require the consumer to reduce usage suddenly when clouds drift
over the PV panels. Thus the contracts ignore the costs required to provide backup for the PV
sources, which are imposed upon other ratepayers across the grid.\textsuperscript{70} TURN’s estimate also
ignores the costs of lost fuel efficiency due to ramping and cycling the dispatchable sources or
the higher maintenance costs associated with those more demanding operating dynamics. It
doesn’t include costs of transmission lines to remote sites where over well over 100 square
miles of solar PV generation would have to be sited. It also doesn’t include the short life spans
of PV systems compared to conventional generators, including Diablo. All of these factors
will raise the relative costs of electricity from solar sources.

Previous analysis by CGNP provided a realistic accounting of overall costs of new
wind and solar sources, including imposed costs, and showed that continued operation of
Diablo is much cheaper.\textsuperscript{71} The cost analysis for new wind and solar sources had as its basis a
comprehensive study performed by the Institute for Energy Research (IER). CGNP offered
two additional expert witnesses involved in producing the study. Travis Fisher’s
qualifications include work as an economist for the Federal Energy Regulatory Commission
for seven years, focusing on wholesale electricity markets and rates. Tom Stacy’s
qualifications include ten years of experience analyzing electricity economics, and five years
serving on the ASME Energy Policy Committee as a member at large.

Finally, several parties have misleadingly claimed that pending California energy

\textsuperscript{69} CGNP Prepared Testimony, pp. 102, line 10, et. seq.
\textsuperscript{70} CGNP Prepared Testimony, pp. 97, line 23. et. seq.
\textsuperscript{71} CGNP Opening Brief, pp. 35, line 17, et. seq.
legislation known as SB 100, California Renewables Portfolio Standard Program: emissions
of greenhouse gases authored by Senator Kevin DeLeon, excludes Diablo's nuclear power.
No such exclusion exists in the plain language of the bill that passed the Senate and is
currently awaiting consideration by the Assembly.

III. CONCLUSION

PG&E has failed to meet its standard of proof. When considering both the costs to
ratepayers and the detriment to the economy, it is clear the proposed closure and rate increases
requested by PG&E are not in the public interest. The information provided by PG&E in this
proceeding is inadequate to warrant an affirmative decision by the Commission. CGNP
recommends complete rejection of PG&E Application A.16-08-006 as not in the public
interest, and authorization of the completion and ratepayer recovery of the costs of all
necessary relicensing activities. CGNP believes that if any further consideration of Diablo’s
future operation is necessary, that it be performed within the IRP or a future, more
comprehensive Proceeding. Furthermore, as does Party CEERT 72, CGNP respectfully
requests that our final oral argument be scheduled concurrent with our Rebuttal Brief before
the Commission in Application A.16-08-006.

Lastly, on May 23, 2017, PG&E, A4NR, TURN, ORA, Mothers for Peace, FOE,
NRDC, Environment California, IBEW Local 1245, and CUE filed a settlement agreement
related to license renewal and cancelled project costs. CGNP urges the commission to reject
this self-serving settlement as not being in the public interest and instead authorize the full
reimbursement of all past and future license renewal costs to firmly establish the plant capital
costs and regulatory costs of future Diablo operation.

72 CEERT Opening Brief, p. 38
/s/ Gene A. Nelson, Ph.D. 16 June 2017

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