

<b>DOCKETED</b>	
<b>Docket Number:</b>	19-SB-100
<b>Project Title:</b>	SB 100 Joint Agency Report: Charting a path to a 100% Clean Energy Future
<b>TN #:</b>	229645
<b>Document Title:</b>	Calif. for Green Nuclear Power, Inc. In Response to the Assigned Commissioner and Admin. Law Judge Ruling Filed at CPUC 2-11-16
<b>Description:</b>	FCPUC Intervenor Californians for Green Nuclear Power, Inc. (CGNP) submits this CPUC filing in R.16-02-007 as one of eight exhibits supporting the continued safe operation of Diablo Canyon Power Plant (DCPP) beyond 2025 as an essential component of California's Path to a 100% Clean Energy Future. Diablo Canyon's pair of safe, reliable, cost-effective, and zero-emissions power reactors are California's largest generation plant by far, producing about 9% of California's in-state generation - the equivalent of more than 5 (five) Hoover Dams annually. In 2010, the California Energy Commission (CEC) commissioned the California Science and Technology Commission (CSTC) to prepare a pair of reports regarding the path to a 100% Clean Energy Future. The CSTC's report conclusions were clear. The safe and cost-effective solution was a dramatic expansion beyond the four commercial nuclear power reactors then in operation. The eminent CSTC scientists and engineers concluded California would require about 30 such reactor
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<b>Organization:</b>	Californians for Green Nuclear Power, Inc.
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**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

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Order Instituting Rulemaking to Develop  
an Electricity Integrated Resource  
Planning Framework and to Coordinate  
and Refine Long-Term Procurement  
Planning Requirements

**R.16-02-007**  
(Filed 02/11/2016)

**CALIFORNIANS FOR GREEN NUCLEAR POWER, INC.'S COMMENTS  
IN RESPONSE TO THE ASSIGNED COMMISSIONER AND  
ADMINISTRATIVE LAW JUDGE'S RULING INITIATING  
PROCUREMENT TRACK AND SEEKING COMMENT ON POTENTIAL  
RELIABILITY ISSUES DATED JUNE 20, 2019**

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July 22, 2019

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

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**I. Introduction**

Independent nonprofit, **Californians for Green Nuclear Power, Inc. (CGNP)** notes the newly adopted Commission Rules regarding **Public Safety Power Shutoffs (PSPSs)** will adversely impact system reliability in the Pacific Gas & Electric (PG&E) service territory. Our comments will focus on a likely early-September 2019 Hypothetical Scenario in which a large scale PSPS prevents PG&E from delivering its hydropower from lakes high in the Sierra Nevada mountains. In consideration of the adverse public safety and adverse public welfare impacts connected with such PSPSs, PG&E will be forced to depend to a significant extent on the safe, reliable high-capacity-factor (>91%) Diablo Canyon Power Plant (DCPP) generation. Furthermore, the continued operation of DCPP fights climate change in accordance with California statutes. **For these reasons, (PG&E) should withdraw its plan to voluntarily close**

**its Diablo Canyon Power Plant (DCPP) in 2025 as its plan does not serve the public interest, nor does it advance public safety.** CGNP's opening argument is the March 26, 2019 advocacy of PG&E's former CEO Geisha Williams for keeping the U.S. nuclear power fleet operating as a critical means to fight climate change.<sup>1</sup> The article also notes PG&E's potential liability of \$10.5 billion for the lethal Camp Fire in November, 2018. Other elements of the "Assigned Commissioner and Administrative Law Judge's Ruling Initiating Procurement Track and Seeking Comment on Potential Reliability Issues Dated June 20, 2019" will also be discussed briefly.

## **2. Important changes associated with the new CPUC PSPS Policy**

Considerable relevant information regarding PG&E's planned implementation of the new CPUC PSPS Policy is found on this webpage <https://tinyurl.com/PGE-PublicSPS> . (CGNP created a shorter URL for the convenience of the Commission.) Particular attention should be paid to a pair of files on the PG&E webpage. They are the May, 2019 PG&E Public Safety Power Shutoff Policies and Procedures (PDF, 5.8 MB) and the PG&E Public Safety Power Shutoff Jun. 21, 2019 Report (PDF 6.7 MB.) Furthermore, the CPUC Fire Threat Map adopted January 19, 2018 is referenced on PG&E's PSPS webpage. (A reduced copy of this map with a red polygon appears two pages hence.)

In Rulemaking R.18-12-005, the Commission has initiated Phase I guidelines regarding such issues as how to provide electricity to the myriad public safety and public welfare services that are dependent on a supply of reliable electric power. In Decision D.19-05-042, dated May 30,

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<sup>1</sup> "Climate Change Must Guide Utility Plans, Ex-PG&E Boss Says" By Keith Goldberg **Law360** (March 26, 2019, 3:55 PM EDT) -- <https://www.law360.com/bankruptcy/articles/1142924/climate-change-must-guide-utility-plans-ex-pg-e-boss-says> retrieved March 27, 2019 "States have an important role in setting an emissions target. Setting wide and aggressive goals is appropriate," Williams said. "I think how to get there should be left to system operators ... and not necessarily by a prescriptive mandate that says you must purchase this percentage of electricity from certain technologies." In making that point, Williams put in a plug for keeping existing U.S. nuclear power plants and their carbon-free emissions up and running for as long as possible.

**"I think that greenhouse gas is the enemy, and we need to decide how we reduce that in the most cost-effective manner,"** Williams said. "To cast that aside would be pretty irresponsible."

2019 there are 23 instances of "Essential" and 10 instances of the acronym for the California Independent System Operator (CAISO.) Review of the 176 pages of this Decision is informative. **PSPS Phase 1 Guidelines:**

<http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M296/K598/296598822.PDF>

### 3. The Sunday, September 8, 2019 Hypothetical Scenario

The first week of September, 2019 was hot with low humidity. There is a large area of high pressure to the east of California. Both the National Weather Service and PG&E's weather forecasts agreed in anticipating "Red Flag" conditions with downslope winds in excess of 40 MPH in the Sierra Nevadas from Redding to the area to the east of Fresno. These hot conditions with high winds were forecasted to start on Monday, September 9 and continued through Wednesday, September 11. A PG&E PSPS is implemented in the Tier 2 and Tier 3 areas to the east of the Central Valley inside the red polygon shown on the map on the following page. As the PG&E PSPS webpage notes, **both transmission and distribution (T&D) systems are shut down in the PSPS area.** Even though there were no fires caused by PG&E's power lines in the PSPS area, there were some small wildfires caused by human activities such as an unattended campfire and chains from a trailer caused sparks while dragging on a highway. Control of those wildfires was hampered by the lack of power within the PSPS. However, PG&E had placed some large portable generators such as they did in Calistoga, CA in November, 2019 at key locations with the PSPS which were beneficial.<sup>2</sup>

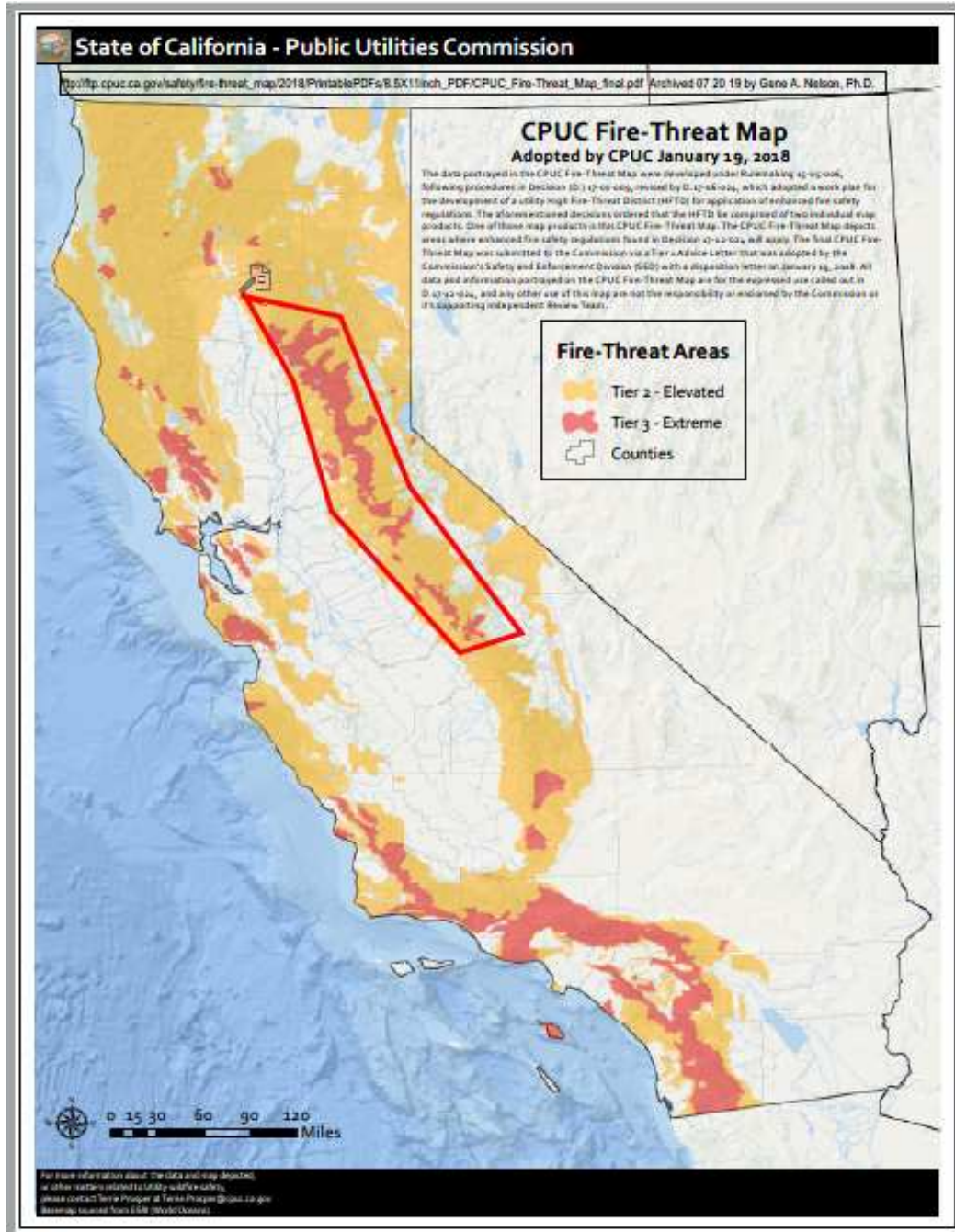
Once the Red Flag conditions subsided, PG&E conducted a thorough inspection of PG&E's T&D system during daylight hours. Any damaged portions of PG&E's T&D system in the PSPS area were repaired. These activities required two additional days. Power was gradually restored to all of the PSPS area by 10:00 PM on Friday, September 13.

From Monday through Friday, there were high temperatures recorded throughout California. Those high temperatures increased electricity demand for air conditioning and pumping water for

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<sup>2</sup> "PG&E installing portable generators in Calistoga prior to possible power shutoff," by Cynthia Sweeney, *The Napa Valley Register*, November 7, 2018, [https://napavalleyregister.com/news/local/pg-e-installing-portable-generators-in-calistoga-prior-to-possible/article\\_ac762dbf-d7e8-51e5-98c1-d7af5b58ad37.html](https://napavalleyregister.com/news/local/pg-e-installing-portable-generators-in-calistoga-prior-to-possible/article_ac762dbf-d7e8-51e5-98c1-d7af5b58ad37.html)

irrigation. Since there was some interruption of imported power from the north as a consequence of the PSPS, there were higher-than-normal south to north flows in the late afternoon to early evenings during the week approximating 4,800 MW on Path 15.<sup>3</sup>



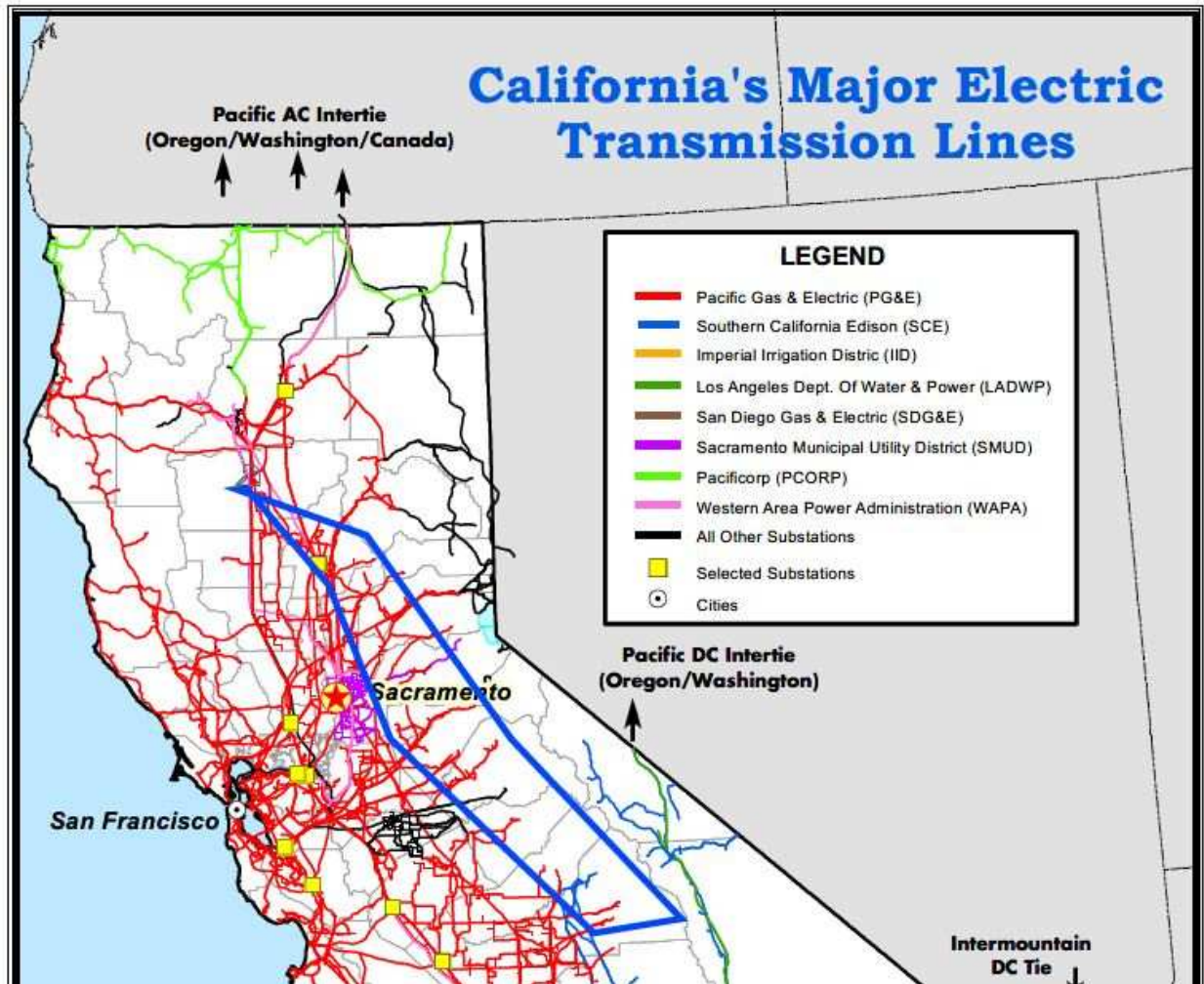
URL: [ftp://ftp.cpuc.ca.gov/safety/fire-threat\\_map/2018/PrintablePDFs/8.5X11inch\\_PDF/CPUC\\_Fire-Threat\\_Map\\_final.pdf](ftp://ftp.cpuc.ca.gov/safety/fire-threat_map/2018/PrintablePDFs/8.5X11inch_PDF/CPUC_Fire-Threat_Map_final.pdf)

<sup>3</sup> "Path 15" Wikipedia [https://en.wikipedia.org/wiki/Path\\_15](https://en.wikipedia.org/wiki/Path_15)



#### 4. PG&E Transmission System Impacts Caused by this Hypothetical Scenario

Here is the map of the Scenario PSPS superimposed as a blue polygon on the northern portion of the CEC's 2012 map of the California electric transmission system.<sup>4</sup> PG&E's transmission system is shown in red lines.



The likely end terminus for each red line going to the right within the blue PPS polygon is one of PG&E's hydroelectric dams. PG&E owns 169 dams.<sup>5</sup>

<sup>4</sup>

[https://water.ca.gov/LegacyFiles/storage/docs/NODOS%20Project%20Docs/NODOS\\_Prelim\\_Admin\\_Draft\\_EIR/31-Power\\_Energy\\_prelim\\_admin\\_draft\\_Dec2013\\_w\\_figures.pdf](https://water.ca.gov/LegacyFiles/storage/docs/NODOS%20Project%20Docs/NODOS_Prelim_Admin_Draft_EIR/31-Power_Energy_prelim_admin_draft_Dec2013_w_figures.pdf) Map at page 52 of 54

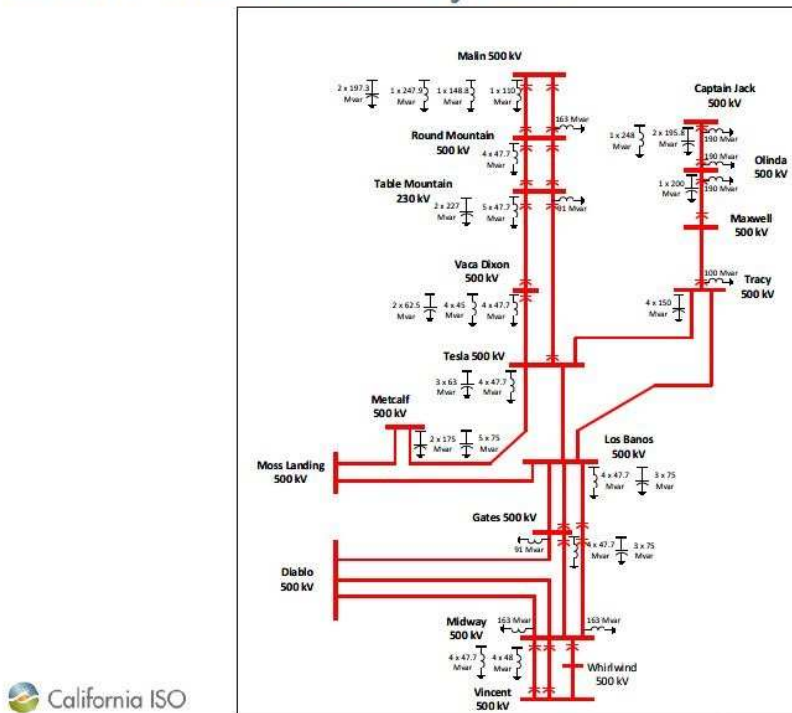
<sup>5</sup> As bankruptcy looms, PG&E will walk away from two dams it owns. What about the other 167? BY Ryan Sabalow and Dale Kasler, *The Sacramento Bee*, January 25, 2019.

## 5. Diablo Canyon reliably feeds into California's 500 kV AC backbone

Here's a schematic of California's 500 kV AC Backbone, courtesy of CAISO, dated November 16, 2018. Diablo Canyon feeds into this important system via two separate pathways. Two sets of 3-phase 500 kV AC lines start at DCPD and end at Midway Substation, near Buttonwillow, California. The third set of 3 phase 500 kV AC lines start at DCPD and end at Gates Substation.

<sup>6</sup> All three segments are about 50 miles long. Essentially their entire lengths pass through areas with low amounts of fuel for wildfires. (See example photographs on next page.)

### 500 kV Transmission System



Page 10

<https://www.sacbee.com/latest-news/article225102345.html>

<sup>6</sup> California Independent System Operator, Preliminary Policy and Economic Assessments, 2018-2019 Transmission Planning Process Stakeholder Meeting, November 16, 2018, Kristina Osboree, Lead Stakeholder Engagement and Policy Specialist. 500 kV System Schematic on page 253 of 312. <http://www.caiso.com/Documents/Presentation-2018-2019TransmissionPlanningProcessMeeting-Nov16-2018.pdf>



**6. Photographs of DCPD feeds to 500 kV system near San Luis Obispo, CA.**

All photographs by Gene Nelson, Ph.D. taken on July 21, 2019



**California Highway 1 crossing near Morro Bay**

**Two sets of lines cross Highway 101 near Avila Beach**

Note the absence of large conifers in these photographs. These photographs support the conclusion that PG&E's DCPD can reliably supply needed power to Northern California while PG&E's hydroelectric generation is sharply curtailed during the late - summer PSPSs. DCPD's current annual power production is 18 billion kWh, or 18 TWh. DCPD produces the equivalent of five (5) Hoover Dams, or almost the annual production of the Grand Coulee Dam in Washington state.

## 7. Forest fuel accumulation in the Sierra Nevadas Increases Wildfire Severity

The area within the above PSPS polygon has millions of large conifers. As a consequence of California's forest management practices over the last century exacerbated by the effects of climate change, there are many dead conifers. This photograph is courtesy of the U.S. Department of Agriculture Forest Service (USFS) on their California Tree Mortality web page. <https://www.fs.usda.gov/main/catreemortality/home>.



A pair of recent USFS press releases underscore the severity of the problem. <sup>7</sup> <sup>8</sup>

Quoting the first paragraph of the most recent USFS press release, " The USDA Forest Service announced today that an additional 18 million trees, mostly conifers, died in California since fall 2017. **Over 147 million trees have died across 9.7 million acres of federal, state, local and private lands in California since the drought began in 2010.** Since 2016, federal, state, and local partners have felled 1.5 million dead trees, primarily those posing the highest hazards to life and property.... There are many more dead trees from prior to 2010, and there are massive numbers of "understory" trees that serve to intensify wildfires. The ABC-10 Sacramento 3-part

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<sup>7</sup> "Record 129 Million Dead Trees in California," Stephanie Gomes, Tree Mortality Team Lead, USDA Forest Service, December 12, 2017. [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd566303.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd566303.pdf)

<sup>8</sup> "Survey Finds 18 Million Trees Died in California in 2018," Stephanie Gomes, Tree Mortality Information Officer, USDA Forest Service, February 11, 2019. [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/FSEPRD609321.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/FSEPRD609321.pdf)

documentary series "Fire, Power, Money"<sup>9</sup> released on July 10, 2019 showed an estimate that based on current rates, it will require about a century to restore California forest ecosystems to a healthy level, with adequate clearances between standing large, healthy conifers. **Therefore, it is safe to conclude there will be PSPSs during the hot, dry, windy days in the late summer in California for the foreseeable future. Most of those PSPSs will be in the area shown in the above Sunday, September 8, 2019 Hypothetical Scenario.**

### 8. Estimating the PG&E PSPS Hydroelectric Curtailment

*Version: July 2018*

<b>2017 POWER CONTENT LABEL</b>		
<b>Pacific Gas and Electric Company</b>		
ENERGY RESOURCES	Power Mix	2017 CA Power Mix**
<b>Eligible Renewable</b>	<b>33%</b>	<b>29%</b>
Biomass & biowaste	4%	2%
Geothermal	5%	4%
<b>Eligible hydroelectric</b>	3%	3%
Solar	13%	10%
Wind	8%	10%
<b>Coal</b>	<b>0%</b>	<b>4%</b>
<b>Large Hydroelectric</b>	<b>18%</b>	<b>15%</b>
<b>Natural Gas</b>	<b>20%</b>	<b>34%</b>
<b>Nuclear</b>	<b>27%</b>	<b>9%</b>
<b>Other</b>	<b>0%</b>	<b>&lt;1%</b>
<b>Unspecified sources of power*</b>	<b>2%</b>	<b>9%</b>
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>
<p>* "Unspecified sources of power" means electricity from transactions that are not traceable to specific generation sources.</p> <p>** Percentages are estimated annually by the California Energy Commission based on the electricity sold to California consumers during the identified year.</p>		
For specific information about this electricity product, contact:	<b>Pacific Gas and Electric Company</b>	
	<b>415-973-0640</b>	
For general information about the Power Content Label, please visit:	<a href="http://www.energy.ca.gov/pcl/">http://www.energy.ca.gov/pcl/</a>	
For additional questions, please contact the California Energy Commission at:	844-454-2906	

Hydroelectric power has been a PG&E mainstay for over a century. Here's the PG&E 2017 Power Content Label from the California Energy Commission (CEC) website. Nuclear power is the leading category at 27%. All forms of hydroelectricity total 21%, and natural gas is 20%.

**During a PSPS, PG&E's nuclear share is likely to remain constant, while PG&E's hydroelectricity could drop to almost zero, depending on the size and location of the PSPS.**

<sup>9</sup> <http://firepowermoney.com>

CGNP also notes that the CPUC Ruling seeking comment on page 12 significantly overstates the contribution of intermittent solar and intermittent wind to California electric power by showing "nameplate" capacity. CGNP showed the capacity factor (or percentage ON time) was only about 20% for both solar and wind for the half year ending on January 31, 2017. Thus, each of those bars should only be about 1/5 the height shown.

The likely constraints on "Maximum Import Capacity" (MIC) are also relevant, as this implies other states will have a diminishing amount of power to export to California. Recent events such as CAISO requesting DCPD to delay the start of its planned refueling outage on September 8, 2015, the CAISO Stage 1 Emergency declaration of May 3, 2017, and the string of CAISO Restricted Maintenance Operations (RMOs) and Flex Alerts at the end of August, 2017 leading to the near--record-load of 50,116 MW, only 154 MW less than the historical peak demand demonstrate if DCPD is voluntarily closed in 2025, substantial new natural-gas-fired generation will need to be constructed. The construction of this new natural-gas-fired generation in response to the voluntary closure of DCPD would contravene many applicable California statutes and CPUC regulations, as CGNP established in A.16-08-006 that DCPD's design lifetime is about a century instead of only 40 years. CGNP also established in A.16-08-006 that PG&E has been an exemplary steward of DCPD. Furthermore, CGNP noted the significant "stress test" that DPP Unit 2 recently passed on December 1, 2018 when the reactor tripped due to a "full load rejection." caused by a failure of PG&E's Transmission Department to update a special protection circuit for 13 years. As a testament to the robust design of DCPD and the excellent operator training, Unit 2 was back on line in five days by December 5, 2018

While the CPUC Ruling imposed the constraint of examining system Resource Adequacy (RA) for the next few years, the figure on page 12 shows that if DCPD is voluntarily closed in 2025, there will be inadequate system RA in 2025 and beyond.

**9. Conclusion: With the changed conditions now imposed by PG&E's Public Safety Power Shutoffs, the maintenance of northern California's public welfare and the maintenance of northern California's public safety depends on the continued operation of DCP. DCP is also California's most potent weapon to fight climate change. For these reasons, PG&E should withdraw its plan to voluntarily close DCP in 2025.**

Dated: July 22, 2019

Respectfully submitted,

/s/ Gene A. Nelson, Ph.D.

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