Exhibit: _____
Witness: Paul Chernick
Date: April 5, 2019

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Application for Approval of Pacific Gas and Electric Company's Commercial Electric Vehicle Rate.	Application 18-11-003 (Filed Nov. 5, 2018)

ERRATA TO

DIRECT TESTIMONY OF

PAUL CHERNICK

ON BEHALF OF

SMALL BUSINESS UTILITY ADVOCATES

Resource Insight, Inc.

APRIL 5, 2019

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ATTACHMENTS

I. IDENTIFICATION & QUALIFICATIONS

Q: Please state your name, occupation, and business address.

A: My name is Paul L. Chernick. I am the president of Resource Insight, Inc., located at 5 Water St., Arlington, Massachusetts.

Q: Summarize your professional education and experience.

A: I received a Bachelor of Science degree from the Massachusetts Institute of Technology in June 1974 from the Civil Engineering Department, and a Master of Science degree from the Massachusetts Institute of Technology in February 1978 in technology and policy.

I was a utility analyst for the Massachusetts Attorney General for more than three years, and was involved in numerous aspects of utility rate design, costing, load forecasting, and the evaluation of power supply options. Since 1981, I have been a consultant in utility regulation and planning, first as a research associate at Analysis and Inference, after 1986 as president of PLC, Inc., and in my current position at Resource Insight. In these capacities, I have advised a variety of clients on utility matters.

My work has considered, among other things, the cost-effectiveness of prospective new electric generation plants and transmission lines, conservation program design, estimation of avoided costs, the valuation of environmental externalities from energy production and use, allocation of costs of service between rate classes and jurisdictions, design of retail and wholesale rates, and performance-based ratemaking and cost recovery in restructured gas and electric industries. My professional qualifications are further summarized in Attachment 1 to this testimony.

Q: Have you testified previously in utility proceedings?

A: Yes. I have testified over three hundred times on utility issues before various regulatory, legislative, and judicial bodies, including utility regulators in thirty-seven states and six Canadian provinces, and three U.S. federal agencies. This previous testimony has included planning and ratemaking for distributed resources, distributed resource planning, the benefits of load reduction on the distribution and transmission systems, utility planning, marginal costs, and related issues.

II. INTRODUCTION

Q: On whose behalf are you testifying?

A: I am testifying on behalf of Small Business Utility Advocates (SBUA).

Q: What is the scope of your testimony?

A: I review the proposal of Pacific Gas and Electric (PG&E) for a new rate for electric vehicle (EV) charging by commercial customers.

Q: What issues do you address?

A: I address three PG&E proposals and make two other recommendations, on the following:

- The elimination of the demand charge and substitution of a similar "subscription charge."
- The lumpiness of the subscription charge.
- The definition of the time-of-use (TOU) peak period. The propriety of allowing nominally commercial buildings that are actually residential in character to use the residential EV rate.

- Marketing, education, and outreach (ME&O) strategies tailored to small commercial customers.

Q: What do you recommend?

A: I recommend that the Commission order PG&E to:

- Revise the small-commercial EV rate to reduce the subscription rate to direct connection costs (the meter, service drop and protective equipment, plus billing and customer accounting expenses);
- Allow EV chargers at residential facilities to choose between the residential EV rate and the new commercial rates;[1]
- Charge the subscription charge for the large-commercial EV rate per kilowatt, rather than in 50-kW lumps; and
- Extend the peak period to 11 PM.

The Commission should also require PG&E to further analyze the following issues that probably cannot be resolved in this proceeding:

- The costs that are driven by an EV customer's undiversified peak load, to refine the subscription charge for the large-commercial EV rate.
- The variation by time of day of exposure to low local or state-wide supply reliability levels, to inform the choice of peak hours.

[1] Some residential and residential-type structures may have charging practices closer to single-home residential charging practices while other structures may have charging practices closer to commercial accounts. These include multi-unit dwellings, condos, dormitories, motels, and other structures. PG&E's Application generally treats these accounts as commercial accounts. Given the diverse charging practices, these accounts should have the option of choosing between EV residential or commercial rates. *See* Pacific Gas and Electric Company Commercial Electric Vehicle Rate Proposal Prepared Testimony (PG&E Test.), Ch. 1, p. 1-7.

- The variation by time of day of transmission and distribution (T&D) loads, to determine how T&D loads should be distributed across TOU periods.

III. THE SUBSCRIPTION CHARGE

Q: Please describe PG&E's proposal for the subscription charge.

A: PG&E proposes to replace the demand charge present in most commercial rates with a subscription charge. The subscription charge is essentially a demand charge that the customer must specify in advance and pay every month, regardless of actual demand. Rather than paying for the specific number of kilowatts used at peak, the customer would pay for the maximum it might use; to make matters worse, PG&E proposes to round up the subscription charge to the next 10 kW for small customers and the next 50 kW for large customers. A customer with a monthly demand exceeding its contract demand would be charged twice the normal subscription rate. Thus, in some instances, PG&E's proposal may be worse than a conventional demand charge in providing price incentives and reflecting costs.

Q: What is the basic problem with demand or subscription charges?

A: These charges are generally inappropriate because they do not reflect the way that customers impose costs on the system. Both demand and subscription charges are based on the customer's monthly non-coincident peak load, regardless of whether that load coincides with high-load, high-cost hours on the generation, transmission or distribution systems. These charges fail the

Commission's rate design principle 4: "Rates should encourage conservation and energy efficiency."[2]

Q: What is PG&E's rationale for the subscription charge?

A: That is hard to determine. PG&E says that the only marginal cost on the distribution system is for primary capacity, which it proposes to recover through TOU energy rates. PG&E appears to be using the subscription demand charge to produce revenue without specific any cost causation.

Q: Is there any reasonable role for a subscription charge in any retail electric rate?

A: Only where the customer's undiversified non-coincidental peak affects the sizing, wear or stress on some equipment. For any customer with a dedicated service drop, their non-coincidental peak determines the sizing of that line. The same is true for the transformer serving the customer, if the customer does not share the transformer with anyone else, or dominates the transformer. As we travel up the distribution system, the customer's non-coincidental peak becomes less important: only a very large load will independently determine the peak hours on a feeder, let alone a substation.

Thus, the subscription charge for small EV customers should be limited to basic customer costs (mostly the meter, service drop and protective equipment), with all other costs recovered through the TOU rate. This will make EV rates more affordable, thereby addressing financial concerns that have discouraged small commercial customers from participating in EV programs.

[2] PG&E Test., Ch. 1, Table 1-1, p. 1-14.

The non-coincidental peak of customer on the large EV rate (especially for charging of transit and medium-duty vehicles) may stress parts of the feeder. PG&E does not propose any method for determining how much equipment is stressed by these non-coincidental peaks, but the large-commercial EV subscription charge is a reasonable placeholder pending further analysis.

Q: Is there any rationale for charging the subscription charge for multiple-kW increments?

A: No. So far as I can tell, utilities have always levied demand charges per kilowatt or kVA. The subscription charge is just a less-flexible demand charge. Requiring a customer who needs one more kilowatt of non-coincident capacity to pay for 10 kW or 50 kW has no economic rationale. The lumpiness proposed in PG&E's filing appears to be motivated by a desire to increase revenues and burden EV customers, either by making them subscribe for more capacity than they need or double-charging them for exceeding their subscription.[3]

IV. TOU PERIODS

Q: Did PG&E select appropriate TOU periods?

A: Not entirely. Even though the TOU periods are used to time-differentiate distribution charges, PG&E appears to have selected the periods based

[3] PG&E cites the practice of cellular carriers, who offer lumpy subscription packages and impose high overage fees. Cellular carriers, who have an incentive to make products look less expensive than they really are and maximize revenues, are not appropriate role models for regulated utilities.

entirely on generation energy prices. The distribution system may be heavily loaded at times when centralized, remote (and even out-of-state) solar generation is pushing down the market energy price, but only the distributed portion of the solar resource is reducing loads on substations and PG&E should examine the timing of peaks and other high-stress periods on the distribution system, as well.

Generation capacity costs, to maintain reliability locally and statewide, may also be driven by loads in a somewhat different daily pattern than the energy costs.

In terms of the generation energy prices, PG&E has selected almost the right TOU hours, with peak hours of 4 PM to 10 PM (hours ending 17 to 22). This is an improvement over the existing commercial TOU periods, in which the peak period ends at 9 PM, since the hour ending 10 PM has higher prices than some other hours in the peak period.[4] Unfortunately, PG&E did not follow through on its analysis.

As shown in Table 1 below, computed from PG&E's MEC-MGCC workpapers, marginal generation energy prices are highest in PG&E's peak hours (in red) and lowest in the super off-peak hours (in green). Except that the hour ending at 11 PM, which PG&E puts in the off-peak) has a higher price than the hour ending at 5 PM, one of PG&E's peak hours. Based on these data, the peak period should be either 4 PM to 11 PM, or 5 PM to 11 PM.

[4] PG&E Test., Ch. 2, p. 2-7.

Table 1:Marginal Energy Costs by Hour

Hour Ending	2017 $/MWh	2017 Rank	2020 $/MWh	2020 Rank
1	$27.94	12	$40.47	9
2	$25.39	14	$36.49	13
3	$23.86	16	$34.07	15
4	$23.30	19	$33.21	17
5	$23.85	17	$34.05	16
6	$25.76	13	$36.96	12
7	$28.21	11	$40.39	10
8	$28.53	10	$39.23	11
9	$24.13	15	$28.84	18
10	$18.75	21	$16.25	21
11	$17.42	24	$12.68	24
12	$17.77	23	$12.81	23
13	$18.20	22	$13.63	22
14	$19.92	20	$17.33	20
15	$23.55	18	$24.76	19
16	$28.70	9	$35.27	14
17	$34.84	7	$47.29	7
18	$41.20	4	$58.78	5
19	$46.14	1	$67.61	2
20	$45.74	2	$67.81	1
21	$43.19	3	$63.80	3
22	$41.06	5	$60.49	4
23	$36.66	6	$53.95	6
24	$32.04	8	$46.93	8

These values are annual averages; if the Commission determines that seasonal pricing may be appropriate, PG&E should evaluate the peak hours by season.[5]

[5] PG&E proposes TOU periods that do not vary by season to "eliminat[e] potentially confusing seasonal TOU variability." PG&E Test, p. 1-21.

V. ME&O STRATEGY

Q: What concerns do you have with PG&E's proposed ME&O activities?

A: The proposed outreach activities are vague, at best. PG&E does not sufficiently describe the specific strategies it would implement to ensure customers understand the potential benefits and charges associated with participation in the EV rates. PG&E states that it will coordinate outreach for EV rates with its outreach programs for EV infrastructure, but it is not clear how PG&E would reach customers who currently do not participate in EV infrastructure programs.

Without targeted outreach, these customers will have little, if any, background information on EVs to help them understand the new EV rates. As I indicated above, the proposed subscription charges are problematic because, among other things, a small commercial customer who needs an additional kilowatt has to subscribe to an additional 10 kW.

Many small commercial customers may have no idea how to determine an appropriate amount to subscribe to and may oversubscribe due to fear of being imposed a penalty for exceeding their subscription level. As part of the enrollment process, PG&E should meet with small commercial customers and help them determine a reasonable subscription level, understand penalties for overages, and, if the Commission does not modify the proposed subscription model, help customers navigate the subscription in lumpy quantities. Small commercial customers will also need help planning EV charging to minimize costs, given the timing of peak, off-peak, and super-off-peak periods.

Q: Does this conclude your testimony?

A: Yes.