Proceeding No.: R.22-11-013
Exhibit No.: NRDC-01
Witnesses: Eric Borden (Synapse Energy Economics)

OPENING TESTIMONY OF ERIC BORDEN SPONSORED BY THE NATURAL RESOURCES DEFENSE COUNCIL ADDRESSING 2024 AVOIDED COST CALCULATOR PROPOSED UPDATES

Natural Resources Defense Council
111 Sutter St., 21st Floor
San Francisco, CA 94104
(415) 875-6100

October 30, 2023

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I. Introduction and Overview of Recommendations

NRDC is a non-profit membership organization with more than 95,000 California members who have an interest in receiving affordable energy services while reducing the environmental impact of California's energy consumption and achieving California's environmental goals cost-effectively and equitably. This testimony is sponsored by Eric Borden of Synapse Energy Economics. Appendix A contains his qualifications.

The Natural Resources Defense Council (NRDC) appreciate the thoughtful approach taken by California Public Utility Commission (CPUC) staff in its 2024 avoided cost calculator (ACC) staff proposal. In particular, the increased integration of supply-side and demand-side modeling will ensure all resources are compared against each other on an apples-to-apples basis to help California ensure reliability and meet its clean energy targets in the most cost-effective manner possible. The testimony presented here focuses on clarifications and additional recommendations for improvement of the ACC, outlined here and discussed further in the ensuing sections:

- NRDC finds, overall, that the modifications to the ACC proposed by staff will increase the accuracy of avoided costs and are based on a sound and logical methodological framework.
- The Commission should adopt principles for the ACC to guide decision-making for these update proceedings.
- "Portfolio rebalancing" should be examined to ensure incrementality of distributed energy resources (DER's) and to determine whether this is required for load reducing DER's.
- The additional revenues required to procure clean energy resources should be called "clean energy policy costs" rather than "GHG avoided costs."
- Considerations of equity can be further enhanced through several transparency measures that present more information about the incremental and distributional impacts of utility applications.
    - While we recognize that recommendations regarding equity are not directly related to the ACC methodology, greater consideration of the distributional impacts of DER programs informed by the ACC is a critical application of the ACC and should be incorporated into this stage of the proceeding.

II. Staff's Proposed Modifications to the ACC Methodology Should be Adopted

Overall, NRDC recommends staff proposals be adopted. Staff proposes the following modifications to ACC methodology: to switch from the "no new DER" scenario to the IRP's latest adopted system plan, to calculate the "GHG avoided cost" in conjunction with avoided capacity costs rather than separately, to benchmark SERVM prices, and other more minor changes and updates which may occur in the future.

Our focus for testimony was on the major changes to ACC methodology. First, we agree that utilization of the IRP's latest system plan rather than a "no new DER" scenario is logical and likely more accurate. Staff summarizes the issue well: "To achieve the goal of evaluating all DER on a level playing field, the avoided costs should accurately calculate the marginal value of DER incremental to a planned portfolio based on the cost of resources that are being avoided."[1] It will also necessarily ensure greater alignment between evaluation of supply-side and demand-side resources. Second, we agree that calculating GHG avoided costs simultaneously with capacity allows "each resource to fully recover its costs while minimizing total costs to ratepayers."[2] This methodology also ensures that benefits are accurately captured through an optimization methodology that will not double-count or under-value these revenue streams. While it is not clear from the proposal how GHG avoided costs will be allocated across hours, we expect to examine this aspect of the proposal at a later date.

III. Guiding Principles

The Commission should adopt the following principles as part of this ACC update. These are based on previous NRDC testimony in the Integrated Distributed Energy Resources (iDER) proceeding.[3]

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[1] Staff Proposal, p. 3.
[2] Integrated Distributed Energy Resources 2024 Avoided Cost Calculator (ACC) Staff Proposal, August 8, 2023 ("Staff Proposal"), p. 8.
[3] R.14-10-003, *Opening Testimony of Mohit Chhabra, Sponsored by the Natural Resources Defense Council, on the Integrated Distributed Energy Resource's Proceeding's Avoided Cost Calculator Update,* September 27, 2021.

Purpose: The ACC should provide accurate estimates of costs avoided by ratepayers when a distributed energy resource (DER) either generates or reduces demand for a marginal unit of energy.

In doing so, the ACC will encourage the deployment of distributed energy resources and demand side management initiatives to attain California's energy needs and environmental & climate policy goals in the most cost-effective and timely manner.

Criteria for inclusion: The ACC should include all relevant utility system costs and utility system related policy compliance costs that would be incurred by the utility (and borne by its customers through their utility bills) in the absence of a demand side initiative.

For example, in the absence of a distributed resource that produces carbon free electricity at 6 PM on a September weekday, the utility would have to purchase additional units of electricity from the wholesale market to deliver to customers. The associated costs that the utility avoids through that distributed resource include, at minimum, the cost of purchasing electricity, the cost of any additional strain on the transmission and distribution grid, the cost of procurement of clean supply side resources to meet state carbon reduction goals, and the costs of resource adequacy contracts. These avoided costs are dependent on when and where the distributed resource saves or produces electricity.

Technology Neutral: The ACC should evaluate all demand side resources on an equal footing relative to other DER's as well as supply side resources.

This is essential to ensure that utilities meet their future energy needs and comply with state environmental policy through the most cost-effective mix of resources. If the ACC over or under-values demand side resources, then the difference will be made up through sub-optimal procurement of supply side resources or possibly unnecessary grid investments which will lead to additional costs borne by utility customers.

Causality: Avoided cost values should be attributable to incremental DER adoption.

Hourly avoided costs should represent and be connected to what the utility would have to spend in the absence of the distributed resource. To this end, the CPUC must critically assess all utility

costs that would be avoided through distributed resource deployment, and comprehensively account for them to ensure that the ACC doesn't under- or over-count distributed resource impact.[4]

Generally, this means determining utility spending in two related counterfactuals, one with distributed resource deployment and one without. The difference in utility spending between these two scenarios are the costs avoided by the utility. Developing these counterfactuals aren't always possible, especially to determine transmission and distribution system costs. To that end, data and analysis applied to estimate these avoided costs should best represent the impact of incremental DER deployment.

Calibrated: Avoided cost values should be calibrated and grounded in real-world data to the extent feasible. The electric grid is complex. Models make necessary assumptions to simulate resource dispatch and grid operation. A good example of calibration is the comparison of SERVM production cost modeling estimated energy prices to those observed in the CAISO market.

Transparency and Applicability: Avoided cost documentation should clearly explain data sources, calculation methodology and rationale, and how these avoided costs should be applied to determine cost-effectiveness. Also, they should distinguish between those avoided costs that apply to all distributed resources and those that are measure specific. An example of a measure specific avoided cost is gas infrastructure upgrades that could be deferred through location specific electrification programs.

IV. Staff Should Analyze and Potentially Incorporate Changes to "Portfolio Rebalancing" Calculations

[4] Addressing causality will also requires the CPUC to confront whether avoided costs should be long run or short-run marginal avoided costs. Long-run marginal avoided costs represent the difference in resource-build required to meet California's GHG reduction targets; short-run avoided costs represent the costs of reducing the operation of the marginal generator in the short-term (e.g., natural gas power plant).

One area that is not addressed by the staff proposal that may require updating is the current approach to accounting for rebalancing of supply-side resources. Currently, the ACC performs "portfolio rebalancing" to account for the interactive effect between increased or decreased load due DER's:

> The ACC assumes that the supply-side portfolio will be rebalanced to achieve the emissions intensity target set in the IRP after accounting for changes in the DER portfolio. With this approach, the GHG emissions impact will reflect the energy sector emissions cost of achieving the required annual intensity target.[5]

The rebalancing value is calculated by multiplying the GHG adder by the average emissions intensity target of the electric sector for each year, as determined in the IRP.[6]

First, staff's proposal is to calculate one "GHG avoided cost" that includes the cap and trade and GHG adder values.[7] It is not clear whether the "GHG adder" can be specifically broken out from the methodology described. Staff should also clarify whether multiplying the entire GHG avoided cost by average emissions intensity is an accurate representation of "rebalancing," if this is the intention.

Second, staff's proposal to use the latest adopted system plan from the Integrated Resource Plan (IRP) proceeding places greater emphasis on ensuring the DER's examined are incremental to what was approved in the IRP and included in the forecast. While the previous methodology assumed "no new DERs" as a baseline, the new approach includes "levels of future Distributed Energy Resources (DER) adoption based on the California Energy Commission (CEC)'s Integrated Energy Policy Report (IEPR) forecasts."[8] "Rebalancing" within the ACC is only needed if DER's are incremental to what is already in the adopted plan. Care will need to be exercised to check IEPR forecasts with proposed program to ensure the CEC has not included

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[5] 2022 Distributed Energy Resources Avoided Cost Calculator Documentation, September 15, 2022 ("2022 ACC Documentation"), p. 35.
[6] 2022 ACC Documentation, p. 38.
[7] Staff proposal, p. 9.
[8] Staff Proposal, p. 2.

the proposed DER's, or some amount of the proposal, in the forecast utilized by the IRP. Utility analyses examining avoided costs should ensure this alignment.

Third, it is not clear why any rebalancing is needed for load reducing DER's. These reduce GHG's, the value of which is calculated by multiplying the GHG adder by the reduction in the marginal resource. Supply-side resources would not need to be "rebalanced" to the emissions target set by the IRP, lower emissions would simply be captured by ratepayers/society in the former calculation. At minimum, staff should provide a clearer explanation with examples for why resources that reduce load require any amount of "rebalancing," which serves to decrease the GHG benefits of the particular program.

V. "GHG Avoided Costs" Should be Called "Clean Energy Policy Costs"

Staff proposes a new methodology to calculate the "GHG avoided cost:"

> The goal of the proposed method is to derive avoided cost value streams for generation capacity and GHG, in addition to the energy avoided costs calculated from SERVM, that are sufficient to "make whole" each supply-side resource selected in the IRP portfolio; these values then represent the explicit and implicit signals that will encourage the investments needed to achieve the state's decarbonization goals.[9]

This value is intended to make up for costs that will be incurred by ratepayers to procure clean energy to meet California's GHG targets which would not otherwise be provided by through energy, ancillary services, and capacity payments. The IRP establishes a GHG target and determines the amount and type of clean energy required to meet that target during a normal weather year for the forecasted load. It is this clean energy procurement that are the additional costs of complying with Senate Bill 100, and DERs can defer costs of this procurement by saving load, shifting load, or generating clean energy behind the customer's meter.

This approach is logical – a resource cannot be expected to be brought online if it is not paid sufficiently to cover expected costs. However, calling the revenues a "GHG avoided cost" is

[9] Staff Proposal, p. 7.

likely to lead to confusion and a potential conflation between this value and the social cost of carbon or damage avoided by society by avoiding GHG emissions – which it is not.

VI. Initial Proposals for Consideration of Equity in Utility DER Funding Proposals

The ALJ's August 8th Ruling asks how "equity issues should be considered in evaluating DER cost effectiveness."[10]As NRDC stated in its November 2022 comments, current evaluation of equity can be substantially improved through "distributional impact analysis that better explains who shoulders the cost of DER programs and who benefits and to what extent."[11] I expand on these comments in this testimony.

Testimony here is meant to provide an initial set of recommendations that can be further developed by stakeholders and the Commission throughout this and successor proceedings. Regardless of what is adopted here, consideration of equity should be continually iterated and improved upon. Further, the proposals discussed here only bring more transparency to this issue by seeking collection and presentation of more detailed data that pertain to equity – the Commission and stakeholders must *use* this data to make programs more equitable.

We primarily define "low-income" in the following proposals as California Alternate Rates for Energy (CARE) and Family Electric Rate Assistance Program (FERA) customers and non low-income as non-CARE/FERA customers.[12] It should be said that this is a highly overly simplistic representation of income strata. As the income graduated fixed charge (R.22-07-005) is developed, utilities should have greater visibility into income levels to present more granular analysis than just CARE vs. non-CARE, and we encourage the Commission to evolve beyond just these two income categories.

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[10] *Administrative Law Judge's Ruling Issuing the 2024 Avoided Cost Calculator Staff Proposal for Party Input*, August 8, 2023, p. 2.
[11] R.22-11-013, *Comments of the Natural Resources Defense Council on Order Instituting Rulemaking to Consider Distributed Energy Resource Program Cost-effectiveness Issues, Data Use and Access, and Equipment Performance Standards,* November 17, 2022, p. 3.
[12] We refer generally to CARE/FERA as CARE customers for simplicity below.

We make several initial proposals for the presentation of data in utility DER applications:

1) Utilities should present *ex-ante* analysis of distributional impacts of DER programs, including the following:
   - Participation rates specific to certain income bands as established in R.22-11-013;
   - Bill impacts on non-participants specific to certain income bands;
   - An analysis of the equity impacts resulting from how programs are funded for intra and inter-class purposes.
2) *Ex-post* analysis of the distributional impacts of DER programs, described above.
3) The Commission and utilities should leverage forthcoming work by Synapse and Lawrence Berkeley National Laboratories on incorporating distributional equity analysis into DER benefit-cost analysis.[13]

These proposals are discussed further below.

A. Utilities should present *ex-post* and *ex-ante* analysis of distributional impacts of programs

Each new application for ratepayer funding to support greater deployment of DERs should include specific analyses that pertain to how benefits and costs are distributed among ratepayers. This includes the following analyses:

1. Expected participation rates specific across income bands. Initially, the percentage of CARE vs. non-CARE customer participation should be assessed.
2. Expected bill impacts on non-participants across income bands. Initially, the percentage of CARE vs. non-CARE customer participation should be assessed.
3. An analysis of the equity impacts resulting from how programs are funded for intra and inter-class purposes.

[13] *Considering Equity When Making Decisions in Distributed Energy Resources,* Synapse Energy Economics, https://www.synapse-energy.com/considering-equity-when-making-decisions-distributed-energy-resources.

4. An *ex-post* analysis of the former three analyses.

Participation rates refer to the number of customers that participate in a given utility program. It should include all related offerings, for example the Energy Savings Assistance Program for energy efficiency, even if this is part of a separate application. We define the "participation rate" as the number of customers receiving the benefit of a ratepayer subsidy divided by the total number of customers in the class. This should be examined for CARE and non-CARE customers, separately.

Bill impacts of programs on non-participants constitute essential data, because not all customers can participate in utility programs. These customers bear the brunt of costs, represent the majority of customers, and must be considered as part of any strategy to improve program equity.

Third, the equity implications of program funding mechanisms should be considered as part of utility analysis. Do certain charges or rate components that collect program costs impact CARE customers more than non-CARE? Are some charges collected on a bypassable basis that exacerbate the cost shift due to NEM? How are costs distributed to the residential versus commercial and industrial classes? These and other questions can be reflected upon in utility applications which may lead utilities and intervenors to discovery more equitable alternatives.

Finally, for programs that have been implemented in previous years, utilities should conduct these analyses for actual program participants rather than a forecast.

B. Forthcoming Work by Synapse, LBNL, and E4TheFuture Will Provide Resources to Help the Commission Examine Equity

Synapse, LBNL, and E4TheFuture have been engaged in work to develop a framework for distributional equity analysis (DEA) that can be conducted in conjunction with a BCA.[14] The goal of this work is to provide a framework to examine how costs and benefits are distributed across priority populations. It will be released in coming months and may provide helpful materials for parties and the Commission as it grapples with these issues.

Dated: October 30, 2023

/s/Eric Borden

Eric Borden
Principal Associate
Synapse Energy Economics
485 Massachusetts Avenue, Suite 3
Cambridge, MA 02139
eborden@synapse-energy.com
617-453-7042

[14] *Considering Equity When Making Decisions in Distributed Energy Resources,* Synapse Energy Economics, https://www.synapse-energy.com/considering-equity-when-making-decisions-distributed-energy-resources.

Eric Borden, Principal Associate

Synapse Energy Economics I 485 Massachusetts Avenue, Suite 3 I Cambridge, MA 02139 I 617-453-7042
eborden@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics, Inc., Cambridge, MA. *Principal Associate,* May 2022 – Present

- Sponsors expert testimony and performs analyses related to utility electric vehicle incentives and policy, wildfire mitigation strategies and costs, risk modeling, rate design, cost allocation, and revenue requirement issues in General Rate Cases and Multi-year Rate Plans.
- Conducts research and analysis related to the cost-effectiveness of distributed energy resources and Integrated Resource Plans.
- Examines utility performance incentives and provides expertise on ratemaking issues.

The Utility Reform Network (TURN), San Francisco, CA*, Energy Policy Expert,* February 2015 - May 2022

- Prepared testimony, conducted analyses, drafted comments, and represented TURN in various proceedings at the California Public Utilities Commission (CPUC) related to general rate cases, wildfire-related safety applications, electric vehicle charging infrastructure, utility procurement, rate design, and demand response.

4 Thought Energy LLC, Chicago, IL. *Senior Energy Analyst*, June 2013 – January 2015

- Created financial models to forecast profits of potential site installations
- Researched state and regional public policy frameworks governing CHP
- Conducted analyses over electricity and natural gas price trends
- Developed presentations and marketing materials for investor meetings

International Renewable Energy Agency (IRENA) Bonn, Germany. *Consultant,* February 2014 – October 2014

- Hired to write a report on worldwide electricity sector battery storage, including primary applications for renewable energy integration, market developments, trends, and case studies
- Conduct research, review literature, interview key industry players, develop case study material
- Travel to Bonn, company sites, and research facilities
- Written report will be sent to policymakers in 167 IRENA member countries

Alexander von Humboldt Foundation (hosted by DIW Berlin), Berlin, Germany. *German Chancellor Fellow*, July 2012 – November 2013

- Research Project: "Energy Storage Technology and the Large-Scale Integration of Renewable Energy"
- Investigated the role of energy storage in Germany for renewable integration through literature review, interviews with German energy experts, and analysis comparing public policy support in Germany and the U.S. for storage technologies
- Invited to hold a presentation at the International Renewable Energy Storage Conference and Exhibition (IRES 2013)
- Discussions with German businesses and governmental ministries; special visit to European Union and NATO headquarters in Brussels
- Attended energy conferences and workshops in Berlin

The Kenrich Group, LLC, Chicago, IL. *Senior Consultant*, June 2008 – July 2009

- Consulted for multiple energy utilities in legal disputes with the Department of Energy (DOE)
- Performed detailed research and quantitative/qualitative analysis to analyze financial impact related to construction of coal-fired power plants, liquid natural gas facilities, and other types of construction
- Contributed to final reports and presentations submitted in arbitration, settlement, or court of law presenting KRG's expert opinion

Charles River Associates, Chicago, IL. *Associate - Intellectual Property*, July 2006 – May 2008

- Developed complex financial models including discounted cash flow, lost profit, and regression analyses to support expert reports within the context of intellectual property and financial litigation in multiple industries
- Created valuation models and supporting materials to value business entities
- Contributed to final reports and presentations submitted in arbitration, settlement, or court of law presenting CRA's expert opinion

EDUCATION

University of Texas, LBJ School of Public Affairs, Austin, Texas
Master of Public Affairs, specialization in Natural Resources and the Environment, 2012
Washington University, St. Louis, MO
B.S.B.A. Finance, Entrepreneurship, 2006

PUBLICATIONS

Borden, E., B. Havumaki, A. Lawton, M. Whited. 2023. *Establishing Income Based Fixed Charged in California.* Synapse Energy Economics for The Utility Reform Network and Natural Resources Defense Council.

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Policy efforts for the development of storage technologies in the U.S. and Germany, DIW Discussion Paper, 2013.

Electric Vehicles and Public Charging Infrastructure: Impediments and Opportunities for Success in the United States, The University of Texas at Austin, 2012.

Clean Energy Technology and Public Policy, LBJ Journal of Public Affairs, editor and contributor, 2011.

TESTIMONY

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NSUARB M10960: Direct Testimony of Eric Borden on the Matter of an Application by Eastward Energy Incorporated for Approval of a Schedule of Rates, Tolls and Charges Pursuant to Section 21 of the Gas Distribution Act. On behalf of the Counsel to Nova Scotic Utility and Review Board. April 12, 2023.

A.22-05-016: Prepared Testimony Addressing San Diego Gas and Electric's Test Year 2024 Wildfire Mitigation Hardening Measures and Related Wildfire Risk Modeling Issues for The Utility Reform Network. March 27, 2023.

A.22-05-015/A.22-05-016: Prepared Testimony of Eric Borden and Courtney Lane Addressing Quantitative Risk Analysis Issues in Sempra's 2024 Test Year General Rate Case for The Utility Reform Network. March 27, 2023.

Public Service Commission of South Carolina (Docket No.2022-254-E): Direct Testimony of Eric Borden regarding the Application of Duke Energy Progress, LLC for Authority to Adjust and Increase its Electric Rates and Charges. On behalf of South Carolina Department of Consumer Affairs. December 1, 2022.

State of Illinois, Illinois Commerce Commission (Docket 22-0432/22-0442): Direct Testimony of Eric Borden and Courtney Lane regarding the Petition for Approval of Beneficial Electrification Plan Under

the Electric Vehicle Act, 20 ILCS 627/45 And New EV Charging Delivery Classes Under the Public Utilities Act, Article IX. On behalf of The People of the State of Illinois. September 22, 2022.

Public Utilities Commission of Maine (Docket No. 2022-00152): Direct Testimony of Melissa Whited and Eric Borden regarding Central Maine Power Company's request for rate design increase and changes. On behalf of the Maine Office of the Public Advocate. December 2, 2022.

A.21-06-021: Prepared Testimony Addressing Pacific Gas and Electric's Test Year 2023 General Rate Case – Wildfire Mitigation and New Customer Connections Cost Requests. June 13, 2022.

A.21-09-008: Prepared Testimony Addressing the Reasonableness of Pacific Gas and Electric 2020 Vegetation Management Balancing Account Overspend. May 25. 2022.

A.21-06-022: Prepared Testimony Addressing Pacific Gas and Electric's Framework for Substation Microgrid Solutions. March 30, 2022.

A.21-10-010: Prepared Testimony Addressing Pacific Gas and Electric's Electric Vehicle Charge 2 Proposal. March 2, 2022.

A.20-09-019: Prepared Testimony Addressing Pacific Gas and Electric's Wildfire Mitigation Memorandum Accounts. April 14, 2021.

A.19-08-013: Prepared Testimony Addressing Southern California Edison's Test Year 2021 Track 2 General Rate Case Memorandum Account Request – Wildfire Expenditures. September 4, 2020.

A.20-03-004: Joint Testimony with Eduyng Castano (SCE) Addressing Data Collection and Evaluation of the New Homes Battery Storage Pilot Program. September 1, 2020.

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A.19-08-013: Prepared Testimony Addressing Southern California Edison's General Rate Case Wildfire Management, Wildfire Risk, Vegetation Management, and New Service Connection Policy Issues and Cost Forecasts. May 5, 2020.

A.18-12-009: Prepared Testimony Addressing Pacific Gas and Electric's Enhanced Vegetation Management and System Hardening Wildfire Mitigation Expenditures. July 26, 2019.

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Resume updated July 2023