

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

Order Instituting Rulemaking To Enhance the Role
of Demand Response in Meeting the State's
Resource Planning Needs and Operational
Requirements.

Rulemaking 13-09-011
(Filed September 19, 2013)

**TESTIMONY AND EXHIBITS OF RONALD J. BINZ
ON BEHALF OF SIERRA CLUB**

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**Testimony Ronald J. Binz
CA PUC Docket No. R.13-09-011
May 6, 2014**

1 ¶ **Q. 1: Please state your name and address.**

2 ¶ My name is Ronald Binz. My business address is 333 Eudora Street, Denver,
3 ¶ Colorado 80220.

4 ¶ **Q. 2: What is your occupation?**

5 ¶ I am a consulting policy analyst, specializing in energy and telecommunications
6 ¶ issues. My practice is called Public Policy Consulting. For thirty-five years I have
7 ¶ served in a variety of roles as an expert in energy policy and regulation, including as a
8 ¶ regulator, consumer advocate, expert witness researcher and consultant. From 2007 to
9 ¶ 2011, I was the Chairman of the Colorado Public Utilities Commission. In June 2013, I
10 ¶ was nominated by President Obama to become the Chairman of the Federal Energy
11 ¶ Regulatory Commission. After a confirmation hearing before a U.S. Senate Committee, I
12 ¶ requested that the President withdraw my name from further consideration in light of the
13 ¶ opposition of the coal industry and certain conservative political groups.

14 ¶ **Q. 3: Have you prepared an appendix discussing your qualifications?**

15 ¶ Yes. Appendix A to this testimony contains my *curriculum vitae*.

16 ¶ **Q. 4: What is your assignment in this case?**

17 ¶ I was asked by Earthjustice to assist the firm in its representation of Sierra Club in
18 ¶ this case. My duties include providing expert testimony on certain of the issues raised in

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1 ¶ this docket and assisting Earthjustice and the Sierra Club in developing its position on
2 ¶ those issues.

3 ¶ **Q. 5: What is Sierra Club's interest in this docket?**

4 ¶ A Sierra Club's overriding interest in this proceeding is to see demand response
5 ¶ (DR) become more widely and more effectively used in California to obviate the need for
6 ¶ construction and operation of natural gas-fired power plants whose emissions adversely
7 ¶ impact global climate change.

8 ¶ A Sierra Club has not been a participant in California's DR markets, and does not
9 ¶ have a commercial interest in the outcome of this proceeding. Other parties, including the
10 ¶ investor-owned utilities, DR providers and aggregators, and large customers with DR
11 ¶ potential, have more direct experience with existing DR programs, and some are
12 ¶ contributing substantial technical expertise to this proceeding. As a former regulator, my
13 ¶ experience and testimony focuses instead on the role of policy in achieving the
14 ¶ Commission's DR goals, and on program designs that might best implement Commission
15 ¶ policy.

16 ¶ A Sierra Club understands the significant role that DR can play in the provision of
17 ¶ sustainable energy resources. The organization's long-standing environmental goals are
18 ¶ tied directly to reducing the emissions of carbon dioxide and other pollutants created in
19 ¶ the production of electricity from fossil fuels. Sierra Club understands that DR can
20 ¶ reduce the overall amount of energy consumed and, even more importantly, enable
21 ¶ utilities to add larger amounts of low-carbon and no-carbon resources.

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1 쉼 □ η The Commission’s actions in this docket will shape the marketplace in which DR
2 쉼 □ η defined, offered, procured, deployed and compensated. If the use of DR resources is
3 쉼 □ η going to continue to grow in California, the market structures must provide all parties –
4 쉼 □ η consumers, utilities and DR providers – with the correct incentives.

5 쉼 □ η **Q. 6: Does Sierra Club support a transition that will move additional DR resources**
6 쉼 □ η **into the CAISO market?**

7 쉼 □ η Yes. Sierra Club’s primary goal is to enable increased usage of economic levels
8 쉼 □ η of DR. Utilizing the market structure offered by CAISO is a likely way to reveal the
9 쉼 □ η value of DR and encourage its economic use.

10 쉼 □ η **Q. 7: Mr. Binz, please summarize your testimony.**

11 쉼 □ η In the testimony that follows, I offer four major recommendations to the Commission:

- 12 쉼 □ η 1. The Commission should proceed in a measured fashion to transition Supply DR
13 쉼 □ η from utility-dispatched to CAISO-dispatched. On behalf of Sierra Club, I identify
14 쉼 □ η three conditions that should be met during this transition. I recommend a schedule
15 쉼 □ η and timeline that will ensure a smooth transition while affording the Commission
16 쉼 □ η ample time to evaluate the success of the transition and make any necessary
17 쉼 □ η adjustments.
- 18 쉼 □ η 2. It is appropriate to adopt measurable goals for DR growth at the beginning of the
19 쉼 □ η transition process. However, the eventual measure of success will be whether the
20 쉼 □ η Commission and the CAISO have developed a marketplace and a set of prices by
21 쉼 □ η removing all barriers to the transparent operation of DR. Further, the Commission
22 쉼 □ η should seek to integrate the DR process more fully into the Resource Adequacy
23 쉼 □ η (RA) and Long Term Procurement (LTP) processes.
- 24 쉼 □ η 3. As customer technologies continue to mature and as customer acceptance continues
25 쉼 □ η to grow, the long-term success of Load-modifying DR requires adoption of new
26 쉼 □ η customer rate structures that induce the desired consumer behavior.
- 27 쉼 □ η 4. Depending on its implementation, the proposed reverse auction mechanism
28 쉼 □ η (DRAM) may retard, rather than promote, the growth of DR. The bid cap in the
29 쉼 □ η proposed mechanism may lead to sub-optimal results. In my testimony I offer
30 쉼 □ η some recommendations for improving the DRAM.

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1 쉼 □ Q, 8: Mr. Binz, what is demand response?

2 쉼 □ η In economics, demand response is a term given to the change in demand for a
3 쉼 □ η product in response to a change in price. When applied to electricity, the California PUC
4 쉼 □ η defines the term as follows:

5 쉼 □ η *Demand response is defined as changes in electricity use by customers from their*
6 쉼 □ η *normal consumption pattern in response to changes in the price of electricity,*
7 쉼 □ η *financial incentives to reduce consumption, changes in wholesale market prices,*
8 쉼 □ η *or changes in grid conditions.” (OIR, p. 3)*

9 쉼 □ η While the term is often used to describe demand reductions, it actually refers to
10 쉼 □ η changes, up and down, in the amount of power demanded. Said another way, DR is
11 쉼 □ η movement along the demand curve occasioned by a change in price.

12 쉼 □ η Of course, prices charged by utilities do not always reflect the marginal cost of
13 쉼 □ η electricity at each locale and at each point in time. This means that consumers might
14 쉼 □ η demand “too much” electricity if the price is lower than the marginal cost. Thus, when
15 쉼 □ η grid conditions change in such a way that costs increase sharply, demand might not
16 쉼 □ η respond because the price doesn’t reflect the marginal cost at the time of the system
17 쉼 □ η event. In cases like this, DR refers to organized efforts to induce customers to alter their
18 쉼 □ η pattern of demand at such points in time, usually by exercising pre-arranged contractual
19 쉼 □ η arrangements.

20 쉼 □ Q, 9: What is the correct level of DR?

21 쉼 □ η In the ideal, the amount of DR is correct when each decision by each customer is
22 쉼 □ η informed by the real-time price of electricity at the customer’s location. If each customer
23 쉼 □ η faces the locational marginal cost of electricity (including marginal transmission and

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1 쉼 □ distribution costs, as well as externality costs), customers will demand the economically
2 쉼 □ correct amount energy by increasing demand or withdrawing demand, behavior that DR
3 쉼 □ programs seek to emulate.

4 쉼 □ **Q. 10: What is the connection of DR programs and dynamic pricing?**

5 쉼 □ The economic literature is replete with studies that show the benefits of dynamic
6 쉼 □ pricing: shaping consumer behavior through dynamic pricing improves the efficiency of
7 쉼 □ the electric grid by conveying the cost of the grid at various times of the day and seasons
8 쉼 □ of the year. The result is lower overall costs and, if environmental externalities are
9 쉼 □ carried in the price signal, improved environmental outcomes.

10 쉼 □ To state the obvious, when customers respond to prices by modifying their
11 쉼 □ demand (in the short run and the long run) supply and demand are integrated. This
12 쉼 □ means there is much less need to employ external measures (like DR “programs”) to
13 쉼 □ provide economic levels of DR. In practical terms, though, we will not likely see prices
14 쉼 □ that are sufficiently sophisticated to eliminate the need for DR programs in the near term.

15 쉼 □ **Q. 11: What is the role of utilities in procuring DR?**

16 쉼 □ Because of their central role in the provision of electric service, utilities are
17 쉼 □ obvious candidates to procure DR resources. Long before the term “demand response”
18 쉼 □ was coined, utilities offered some customers (mainly industrial customers) discounts or
19 쉼 □ rebates if the customer allowed a part of its load to be “interrupted” under certain grid
20 쉼 □ conditions. The utilities’ close connection to their customers and the trust relationship
21 쉼 □ that often (but not always) exists means that utilities have certain advantages in procuring
22 쉼 □ DR. That said, utilities are often less flexible than non-utility aggregators or providers

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1 쉼 □ whose primary business is DR, and may be less able to fine-tune DR offerings to select
2 쉼 □ groups of consumers.

3 쉼 □ **Q. 12: What is the role of third parties in procuring demand response?**

4 쉼 □ Third parties play an important role in acquiring DR resources from customers
5 쉼 □ and providing it to the utilities. Today third parties act chiefly as aggregators for utilities.
6 쉼 □ In the future their role will likely grow as their direct access to ISOs expands. Speeding
7 쉼 □ this movement will be technological advances that make it possible for third parties to
8 쉼 □ aggregate customers more easily outside of the utility context.

9 쉼 □ As Chairman of the Colorado Public Utilities Commission, I led the effort to
10 쉼 □ require Xcel Energy to issue an RFP for third-party provided DR resources. In effect, the
11 쉼 □ third-party resources competed with utility-acquired DR resources.

12 쉼 □ In Colorado and other states without an explicit wholesale electricity market,
13 쉼 □ utility purchases comprise the market. In California and many other places in the country,
14 쉼 □ the ISO is the entity that simultaneously operates the grid, and also hosts the market in
15 쉼 □ wholesale electric sales and DR offerings.

16 쉼 □ **Q. 13: What is the long-term future of DR?**

17 쉼 □ In the longer run, we should expect energy supply and demand to be integrated in
18 쉼 □ a way that will not require the same sort of intervention that characterizes today's DR
19 쉼 □ programs". Maturation of the Smart Grid will enable "prices to devices" enabling
20 쉼 □ customers of all sizes to develop risk profiles that allow a response from their devices
21 쉼 □ that can track the price of grid power in real time. On this time horizon, we will likely

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1 쉼 □ not use the term “demand response” in the same way it is used today, any more than we
2 쉼 □ use the term when discussing demand for gasoline or lemons or other consumer goods.

3 쉼 □ **Q. 14: What are the appropriate goals for DR in California?**

4 쉼 □ The Commission has asked for comment on proposed DR goals in its Scoping
5 쉼 □ Order. In Appendix B, the Commission proffered a series of annual goals for price-
6 쉼 □ responsive DR, beginning at 2.5% in 2014 and growing to 5.0% of peak load in 2020. As
7 쉼 □ a first approximation of the economic levels of DR, these goals are probably sufficient, if
8 쉼 □ conservative. The cap for emergency DR is set at 2.0% of peak load, consistent with the
9 쉼 □ approved Settlement Agreement on Phase 3 Issues Pertaining to Emergency-Triggered
10 쉼 □ Demand Response Programs, in R.07-01-041.

11 쉼 □ If we look to another major ISO market, PJM has cleared bids for emergency DR
12 쉼 □ in its capacity auction equal to about 14% of system peak load. While there are many
13 쉼 □ differences between PJM and CAISO (and arguably even more differences between the
14 쉼 □ Mid-Atlantic region and California), these numbers are still relevant and instructive.¹

15 쉼 □ Because prices and volumes in the proposed DRAM auction will not be linked to
16 쉼 □ the cost of avoided capacity, it is difficult to know whether the DR capacity goals are
17 쉼 □ reasonable. Unlike the case with Energy Efficiency, where the goal is “all cost-effective
18 쉼 □ EE,” there is no comparable cost-effectiveness measure for DR. Sierra Club suggests
19 쉼 □ that, in this circumstance, the Commission should define success with two elements:

1 쉼 □ It is also important to note PJM recently successfully petitioned FERC to allow it to limit
2 쉼 □ Summer DR resources to 10% of Summer Peak Load in a vote that pitted DR providers against
3 쉼 □ generation owners. Many commenters viewed this as a victory for generators, since the
4 쉼 □ limitation of DR will likely push up capacity prices in future PJM capacity auctions.

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- 1 쉼 □ η 1. Whether the amount of DR (*ex ante* estimates and *ex post* performance)
2 쉼 □ η increases year-on-year by a reasonable percentage; and
3 쉼 □ η 2. Whether the administrative requirements and mechanics of the process are
4 쉼 □ η transparent; do not discriminate among DR providers; and are both provider-
5 쉼 □ η and consumer-friendly.

6 쉼 □ η These are admittedly soft goals, but appropriate in a circumstance where there is
7 쉼 □ η not a single market for capacity and DR.

8 쉼 □ η The first measure of success can be relatively straightforward, as shown by the
9 쉼 □ η Commission's starting point with price-responsive DR levels in the DRAM. The second
10 쉼 □ η measure of success will require monitoring and analysis by Commission staff, and should
11 쉼 □ η reflect the opinion of the users as to how the system is functioning. Most of the DR
12 쉼 □ η aggregators operate in multiple jurisdictions and will be able to report on the relative
13 쉼 □ η health of the system being used in California.

14 쉼 □ η **Q. 15: What did the Commission decide with respect to “bifurcation” in D. 14-03-026?**

15 쉼 □ η In its Decision, the Commission defined Supply DR and Load Modifying DR as
16 쉼 □ η follows:

17 쉼 □ η *Load Modifying demand response is a resource that reshapes or reduces*
18 쉼 □ η *the net load curve. Supply Resource demand response is a resource that is*
19 쉼 □ η *integrated into the CAISO energy markets. [Footnotes omitted] D.14-03-*
20 쉼 □ η *026, at page 20.*

21 쉼 □ η
22 쉼 □ η After adopting these definitions, the Commission went on to offer a preliminary
23 쉼 □ η categorization of existing DR resources in the following Table 2, and asked parties to
24 쉼 □ η comment on this preliminary classification.

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1 쉼 □ η The most important remaining question is then: which DR resources should the
2 쉼 □ η utilities be required to offer through CAISO, and which resources should be reserved to
3 쉼 □ η the utilities for use in addressing local reliability issues?

4 쉼 □ η **Q. 16: Mr. Binz, please discuss the bifurcation of demand response into Supply DR
5 쉼 □ η and Load Modifying DR?**

6 쉼 □ η “Dispatchability” is a relatively straightforward and uncontroversial concept in
7 쉼 □ η the electric power industry. A resource is dispatchable if its operation can be scheduled
8 쉼 □ η to be effective when and where needed, and at a predictable level of output (or
9 쉼 □ η incremental load in the case of DR). Throughout this proceeding, CAISO has stressed
10 쉼 □ η that the resources that should properly be offered through the CAISO market structure are
11 쉼 □ η those resources that are “dispatchable.” Sierra Club agrees that ISO-dispatched resources
12 쉼 □ η should be limited to such dispatchable resources.

13 쉼 □ η In our view, Table 2 correctly separates dispatchable resources from non-
14 쉼 □ η dispatchable ones. The Supply Resources column contains all dispatchable DR
15 쉼 □ η resources, and the Load Modifying Resources column contains all non-dispatchable ones.

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1 쉼 □ η In its decision, the Commission acknowledges that:

2 쉼 □ η *We agree that the CAISO cannot have exclusive control of demand response.*
3 쉼 □ η *Demand response must be available to address local issues as well as system*
4 쉼 □ η *wide issues. D.14-03-026, at page 22.*

5 쉼 □ Q. **17: Mr. Binz, how does Sierra Club propose to harmonize the needs of the**
6 쉼 □ η **CAISO and the utilities with Sierra Club’s overarching goal of increasing**
7 쉼 □ η **the amount of economic DR used in California?**

8 쉼 □ η Sierra Club believes that, with an appropriate transition plan in place, and with a
9 쉼 □ η clear understanding of what it means to be “dispatched in the CAISO market,” these
10 쉼 □ η several goals can be harmonized. When these two elements are in place, Sierra Club
11 쉼 □ η supports the classification in Table 2. Here are the elements:

12 쉼 □ η **1. Detailing the CAISO-Utility Relationship**

13 쉼 □ η The Commission must detail clearly the implications of classifying a DR
14 쉼 □ η resource as a Supply DR resource. In other words, what precisely will be the
15 쉼 □ η requirement on utilities in offering DR resources into the CAISO market
16 쉼 □ η during the ordinary course of business, and what exceptions are allowed. In
17 쉼 □ η Sierra Club’s view, any requirement that utilities offer these resources into
18 쉼 □ η CAISO must acknowledge that there will be departures from the ordinary
19 쉼 □ η course of business when a utility needs to dispatch Supply DR resources to
20 쉼 □ η address local reliability or cost issues. Under such a regime, utilities should
21 쉼 □ η be allowed to withhold DR resources from the CAISO under carefully
22 쉼 □ η prescribed circumstances.

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1 쉰 □ η **2. Transition and Staging of Resource Treatment**

2 쉰 □ η As discussed more fully below, Sierra Club strongly recommends that the
3 쉰 □ η Commission stage the transition of groups of DR resources to the CAISO
4 쉰 □ η market and move only portions of each resource initially.

5 쉰 □ η **3. Oversight over Program Design and CAISO Specifications**

6 쉰 □ η There will inevitably be a certain amount of friction moving an existing DR
7 쉰 □ η resource from a utility to the CAISO market. Utilities have their programs and
8 쉰 □ η requirements today and CAISO has its specifications for DR programs it feels
9 쉰 □ η it can reliably dispatch. Bringing together those different regimes will be the
10 쉰 □ η work of the stakeholders; however, the Commission must ensure that this
11 쉰 □ η process moves along efficiently and incorporates all stakeholders' interests.
12 쉰 □ η Sierra Club is especially concerned that the transition and changes in program
13 쉰 □ η design should not jeopardize the growth of economic DR in California.

14 쉰 □ η **Q. 18: Please describe the transition process by which Supply DR could be offered
15 쉰 □ η in the CAISO market.**

16 쉰 □ η I recommend that the Commission adopt a transition process for the six major
17 쉰 □ η Supply DR resources into the CAISO market over a period of time. Beginning with the
18 쉰 □ η largest emergency DR program, the Base Interruptible Program, I recommend that each
19 쉰 □ η major state-wide program be required to be offered into the CAISO market in two steps:
20 쉰 □ η half of the capacity of the resource initially, and the balance of the resource within three
21 쉰 □ η or four years following the initial one-half.

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1 쉼 □ η As examples, I recommend that half of the BIP resources be required to be
2 쉼 □ η offered in the CAISO market initially, with the balance being offered into the CAISO
3 쉼 □ η market not more than three years later. One year after the BIP transition has begun, I
4 쉼 □ η recommend that a transition begin for the CPB and DBP programs, with half the capacity
5 쉼 □ η offered initially and the balance within three years. Similarly with the programs that
6 쉼 □ η entail a larger number of participants, AC, AMP and API.

7 쉼 □ η I have prepared Exhibit RJB-1 detailing this proposal and showing the resulting
8 쉼 □ η timeline. It is a two-page exhibit that describes the recommended disposition of each
9 쉼 □ η Supply and Load Modifying resource.

10 쉼 □ Q. **19: What is the purpose of staging the transition and moving only a portion of
11 쉼 □ η the programs' capacity initially in each stage.**

12 쉼 □ η Sierra Club has consistently argued that the overall goal of the bifurcation process
13 쉼 □ η created in this docket should be to expand the amount of DR and its effectiveness. In its
14 쉼 □ η Decision, the Commission adopts the starting point that certain existing DR resources are
15 쉼 □ η suitable for inclusion in the CAISO market. This means that the resources will be
16 쉼 □ η dispatched upon the decision of CAISO depending on grid conditions and the relative
17 쉼 □ η price of all resources bid into the market. Although this sounds straightforward, there has
18 쉼 □ η been very little such activity through the existing DR channels created by the CAISO,
19 쉼 □ η Participating Load and Proxy Demand Response.

20 쉼 □ η I suggest there are several advantages to the staging and the transaction periods
21 쉼 □ η that I am recommending:

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- 1 쉼 □ η • Staging the movement of various DR Supply resources to the CAISO
- 2 쉼 □ η market (first BIP, then CBP and DPB, followed by AC, AMP and API)
- 3 쉼 □ η will allow the utilities and CAISO to focus on any programmatic changes
- 4 쉼 □ η needed to harmonize program designs and CAISO requirements. This
- 5 쉼 □ η harmonization will be a multi-dimensional discussion among utilities,
- 6 쉼 □ η aggregators, CAISO, the Commission and other parties in interest.
- 7 쉼 □ η • Creating a transition for each resource category (e.g., half of the BIP
- 8 쉼 □ η capacity initially, followed by the balance in three years) will allow the
- 9 쉼 □ η Commission to assess the effectiveness of each transition and require any
- 10 쉼 □ η needed changes. With the suggested timeline, the Commission will have
- 11 쉼 □ η approximately two years' history of CAISO market participation before
- 12 쉼 □ η transitioning the balance of any resource. If the Commission determines
- 13 쉼 □ η that moving a program to CAISO dispatch is not working satisfactorily, it
- 14 쉼 □ η could revisit the transition and make adjustments.
- 15 쉼 □ η • This with-and-without situation will also establish a creative tension
- 16 쉼 □ η between the utilities and CAISO, since performance of the programs under
- 17 쉼 □ η each scenario can be compared.
- 18 쉼 □ η • Stretching out the transition over several years will provide the Commission,
- 19 쉼 □ η the utilities and CAISO ample time to evaluate the overall transition.

1 쉼 Q. 20: What steps can the Commission take to improve the Load Modifying DR
2 쉼 resources (LMR)?

3 쉼 A As I suggested earlier, the Load Modifying DR programs are likely to grow in
4 쉼 relative value and importance as consumer technology evolves, as customer familiarity
5 쉼 with smart grid capabilities increases, and as more sophisticated rate structures are
6 쉼 deployed. I understand that the Commission is examining rate structures in other dockets,
7 쉼 and that the California Legislature has addressed retail rate structures as recently as last
8 쉼 year. For these reasons, I do not offer specific comments on how the various LMR
9 쉼 resource offerings could be improved.²

10 쉼 A There at least three most important aspects of LMR offerings that regulators must
11 쉼 examine to improve their effectiveness.

- 12 쉼 A 1. Whether the price signals are clear and correct;
- 13 쉼 A 2. Whether the tariff designs are customer-friendly; and
- 14 쉼 A 3. How effectively the utilities market the measures.

15 쉼 Q. 171: Have you reviewed Attachment B to the Revised Scoping Memo and
16 쉼 Guidance Ruling issued in this proceeding on April 2, 2014, which described
17 쉼 the Demand Response Auction Mechanism Proposal?

18 쉼 A Yes, I have. I have also reviewed the DRAM questions in Attachment A, and the
19 쉼 Energy Division’s DRAM presentation for the April 28, 2014 Q&A informational
20 쉼 meeting, and have been briefed concerning some of the information conveyed there.

² I have written elsewhere about strategies that regulators might employ to move significantly toward forms of dynamic pricing. Exhibit RJB-3 contains an article I wrote for EnergyBiz Magazine discussing one approach to making time-of-use rates mandatory for a subset of residential customers.

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1 쉼 □ Q. 182: The DRAM Proposal (on page 1) states that the reverse auction “is designed
2 쉼 □ to both cost-effectively procure DR capacity and enhance the viability of DR
3 쉼 □ resources in the CAISO wholesale market.” Will these dual objectives
4 쉼 □ enhance the role of DR in meeting California’s energy needs?

5 쉼 □ Perhaps. While both policy objectives are important, Sierra Club is concerned
6 쉼 □ that the proposed DRAM may create a conflict between the objectives. Sierra Club
7 쉼 □ agrees that it is desirable to enhance the viability of DR resources in the CAISO
8 쉼 □ wholesale market, and that these resources must be cost-effective over time. However,
9 쉼 □ the lack of progress to date in integrating DR resources into CAISO’s market does not
10 쉼 □ appear to be related to price or cost. Instead, the barriers appear to be structural or
11 쉼 □ institutional.

12 쉼 □ A reverse auction mechanism will likely put downward pressure on prices for DR
13 쉼 □ products bid into the auction. This is a commendable long-term effect for a mechanism
14 쉼 □ like DRAM. But this effect may not contribute, and could even hinder, the near term
15 쉼 □ goal of wholesale market integration. If DRAM works as designed, it will put pressure on
16 쉼 □ margins for DR providers and customers in a position to offer these resources. This
17 쉼 □ could diminish their incentive to participate. Further, DRAM might impose transactions
18 쉼 □ costs on relatively small potential bidders or new entrants offering pioneering solutions,
19 쉼 □ that would be difficult to profitably absorb.

20 쉼 □ California’s Renewable Auction Mechanism (RAM), on which DRAM appears to
21 쉼 □ be modeled, targets renewable (mostly solar) projects offering 3 to 20 MW of capacity.
22 쉼 □ Established DR providers with large customers may be able to offer resources of this size
23 쉼 □ and absorb the costs of participating in DRAM. However, new entrants offering

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1 쉼 □ 인 innovative technologies that can aggregate much larger numbers of smaller customers
2 쉼 □ may not, compounding obstacles to market entry and expansion, at least in the near term.
3 쉼 □ In other words, by prioritizing cost reduction through a mechanism originally
4 쉼 □ designed for multi-MW generation projects able to absorb the risks and costs of a reverse
5 쉼 □ auction process, DRAM could inadvertently limit market participation to larger, more
6 쉼 □ well-established providers and discourage innovative business models and nascent DR
7 쉼 □ technologies.

8 쉼 □ Q. 193: The DRAM Proposal (on page 2) states that in addition to current

9 쉼 □ Participating Load and Proxy Demand Response, and new Reliability

10 쉼 □ Demand Response programs, DR resources “could also provide other

11 쉼 □ services for flexible, ancillary service, & other needs.” Do you agree?

12 쉼 □ This may well be possible, but the nature, extent, and value of such contributions

13 쉼 □ remain to be established by evidence in this case. The CAISO and others have convincingly

14 쉼 □ demonstrated the need for flexibility and enhanced ancillary services as wind and solar

15 쉼 □ resources contribute increasing proportions of California’s electricity supply. What is not

16 쉼 □ yet clear is how, how much, and when DR resources can contribute to addressing these

17 쉼 □ needs.

18 쉼 □ For example, in off-peak months the CAISO’s Duck Curve projects increasing

19 쉼 □ late-afternoon to early evening ramping needs with higher penetrations of intermittent

20 쉼 □ renewable resources. What is not well understood is what portion of these ramping needs

21 쉼 □ DR resources might realistically meet; what characteristics these resources will need to

22 쉼 □ offer; how to value their contributions; and what policies will best incentivize customers

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1 쉼 □ and aggregators to make these resources available when they are needed. Sierra Club
2 쉼 □ strongly believes that the Commission should invite evidence on these questions to better
3 쉼 □ inform its decision on the procurement mechanisms best suited to meeting a range of
4 쉼 □ specific wholesale market needs as variable generation resources contribute increasingly
5 쉼 □ to California's electricity supply.

6 쉼 □ **Q. 204: The DRAM Proposal (page 4) observes that California's RAM has so far**
7 쉼 □ **proven successful because prices have declined across at least three of the**
8 쉼 □ **four auctions held to date, from \$90/MWh to \$80/MWh. Is it reasonable to**
9 쉼 □ **expect comparable results for the DRAM proposal?**

10 쉼 □ As mentioned above, the RAM was designed to address markets and circumstances
11 쉼 □ quite different from those confronting DR in California. RAM's design evolved from the
12 쉼 □ consideration of European-style feed-in tariffs at a time when their high costs and
13 쉼 □ inflexibility had begun to seriously destabilize world solar markets and undermine solar
14 쉼 □ industry development. In that context, introducing competitive market pressure in the form
15 쉼 □ of a reverse auction addressed market problems that many feared could result in a backlash
16 쉼 □ against the deployment of solar and other renewables.

17 쉼 □ DR does not face those challenges, and there does not appear to be substantial
18 쉼 □ concern about the prices paid for DR. Further, the price declines observed during several
19 쉼 □ years of RAM auctions reflect much broader solar industry trends over these years; I
20 쉼 □ doubt they should be attributed solely to the RAM process, as successful as it has been.

21 쉼 □ **Q. 25: The DRAM Proposal (page 5) would allow a utility to reject bids if it finds**
22 쉼 □ **evidence of market manipulation, including bids at "artificial and**

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1 쉼 □ η **unreasonable prices”, or for customers or resources for which there is**
2 쉼 □ η **“insufficient evidence or suspect evidence”. Are these appropriate**
3 쉼 □ η **standards?**

4 쉼 □ η I believe that they are appropriate in concept, but would urge the Commission to
5 쉼 □ η define these standards further to make them workable in practice. In addition to these
6 쉼 □ η grounds, the utilities should have some ability to assess product and provider viability.
7 쉼 □ η Again, the RAM history is relevant since that mechanism was designed, in part, to
8 쉼 □ η address the fact that too many project awards in RPS solicitations failed or were seriously
9 쉼 □ η delayed. RAM imposed viability criteria for projects and development entities that
10 쉼 □ η offered them. The utilities should have some discretion in the DRAM auction process.

11 쉼 □ η Whether the Commission ultimately adopts DRAM or some other procurement
12 쉼 □ η approach, I support the DRAM Proposal’s direction (page 12) that utilities use their
13 쉼 □ η aggregator managed portfolio contracts as the starting point for the standard contract for
14 쉼 □ η price-responsive DR products. Beyond that, I recommend examining the project and
15 쉼 □ η developer viability criteria adopted for RAM auctions, and to determine to what extent
16 쉼 □ η those can be adapted for use in the DR context.

17 쉼 □ η **Q. 216: What are your main concerns about the DRAM proposal?**

18 쉼 □ η I have three basic concerns about the DRAM proposal.

19 쉼 □ η 1. As discussed above, that the cost of participating in the DRAM may eliminate
20 쉼 □ η some potential DR providers.

21 쉼 □ η 2. That the DRAM is a stand-alone auction, independent of the cost of avoided
22 쉼 □ η capacity, which is one of the main purposes of acquiring DR resources.

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1 쉼 □ η 3. That the amount of DR acquired will be administratively determined by the bid
2 쉼 □ η cap mechanism. The bid cap (average of bids without outliers) may not be a
3 쉼 □ η good choice for determining the best level of DR, as can be shown by an
4 쉼 □ η example.

5 쉼 □ η **Q. 227: Please illustrate your third concern about the functioning of the bid cap,**
6 쉼 □ η **defined as the net average of bids.**

7 쉼 □ η We cannot know in advance the relative distribution of the bids for DR capacity.
8 쉼 □ η Exhibit RJB-2 illustrates a likely scenario where some bids are quite low in price, a few
9 쉼 □ η are quite high, and most are grouped in the middle. In this graph, the vertical axis is
10 쉼 □ η price, and the horizontal axis is the percentage of capacity bid. For a given price, one can
11 쉼 □ η determine what percentage of all DR was offered at a price at or below the given price.

12 쉼 □ η The exhibit shows a dotted line at Price = P_1 , the average of all prices, which is
13 쉼 □ η defined as the bid cap. Quantity = Q_1 corresponds to price P_1 , and indicates the
14 쉼 □ η maximum quantity of DR acquired in the auction.

15 쉼 □ η However, inspection of the distribution shows that significantly more DR
16 쉼 □ η (quantity Q_2) could be acquired for a relatively modest increase in price to P_2 . In this
17 쉼 □ η illustration the hard bid cap may lead to a sub-optimal decision in which too little DR is
18 쉼 □ η obtained. This is especially important to consider when the amount of DR obtained (and
19 쉼 □ η the price paid) is unconnected to the price of avoided capacity.

20 쉼 □ η **Q. 238: What are your recommendations to improve the DRAM proposal?**

21 쉼 □ η I have three recommendations.

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- 1 쉼 □ η • Instead of using a hard-and-fast bid cap as proposed, consider using the average
2 쉼 □ η of bid prices (after excluding outliers) as a default that can be overridden,
3 쉼 □ η depending on the distribution of bids.
- 4 쉼 □ η • Alternatively, develop a “reserve bid cap” that is not published, is independent
5 쉼 □ η of the actual bids, and is related to the estimated capital cost of a supply
6 쉼 □ η resource avoided by DR.
- 7 쉼 □ η • Consider adopting a single price clearing mechanism to improve bidding
8 쉼 □ η efficacy.

9 쉼 □ η **Q. 249: Apart from your overall comments on DRAM, above, can you respond to**
10 쉼 □ η **the specific DRAM questions posed on pages 3 and 4 of Attachment A to the**
11 쉼 □ η **Commission’s April 2 Scoping and Guidance Memo?**

12 쉼 □ η Most of the DRAM-related questions listed in Attachment A can be answered
13 쉼 □ η better by parties who expect to participate directly in DRAM or alternative procurement
14 쉼 □ η mechanisms the Commission may adopt, and potentially to enter into standard or other
15 쉼 □ η contracts to provide or acquire DR products or services. For that reason, I will leave it to
16 쉼 □ η others to respond to most of the Attachment A questions, and simply note that I have
17 쉼 □ η addressed some of them. Regarding additional eligibility criteria for bids and bidders,
18 쉼 □ η see my response to Question 25, above. Regarding basing a capacity cost cap on the
19 쉼 □ η average of bids received per auction, see my response to Questions 26 – 28.

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1 쉼 Q. 30: Mr. Binz, do you think California’s DR needs will be fully addressed by
2 쉼 utilities, or should third parties have increased access to the CAISO market?

3 쉼 While the Commission might reasonably narrow its focus initially to utilities
4 쉼 bringing DR resources to the CAISO market, in the longer run, the Commission should
5 쉼 ensure that “third parties” have increased ability to offer DR services directly to the
6 쉼 CAISO. This will increase the availability of DR and contribute helpful competitive
7 쉼 pressure in this area, leading to lower consumer prices.

8 쉼 Moreover, as the Smart Grid and electric storage regimes become more fully
9 쉼 developed, we should expect new players to enter the energy services market, positioning
10 쉼 themselves, in some cases, as aggregators of consumer supply, demand, storage and DR.
11 쉼 While utilities will continue to perform some of these functions at the same time, we
12 쉼 should expect healthy competing activities from a variety of new entrants.

13 쉼 Q. 251: Does the Commission have a role in tracking the operation of Supply DR
14 쉼 resources that are cleared through the CAISO market?

15 쉼 No and yes. When a DR resource is dispatched by CAISO following its success
16 쉼 in the CAISO auction, the Commission should presume that CAISO is appropriately
17 쉼 selecting and dispatching the resource. In that sense, the Commission should not look
18 쉼 over CAISO’s shoulder or second-guess its operational decisions. DR resources will
19 쉼 either have been selected for a capacity payment through DRAM or an alternative
20 쉼 Commission-approved mechanism. They will participate in the CAISO auction to the
21 쉼 extent they are required to be available, and/or they will choose to offer themselves in the
22 쉼 energy market with or without a capacity payment. Assuming the DR providers are

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1 쉼 □ a)iding by their availability obligation, it is an operational matter whether they are called
2 쉼 □ b) provide service.

3 쉼 □ η However, there is another area in which the Commission should actively review
4 쉼 □ CAISO’s hosting of the DR regime. Specifically, the Commission should continuously
5 쉼 □ r)view the requirements imposed on DR bidders by CAISO to ensure that CAISO’s
6 쉼 □ n)ogram specifications are reasonable and designed to attract economic levels of DR.

7 쉼 □ Q. 262: What is Sierra Club’s position on the remaining issues concerning
8 쉼 □ B)UGs?

9 쉼 □ η As the Commission has recognized, back-up generation typically uses high
10 쉼 □ n)itting fossil fuels. Disallowing their use for DR programs for resource adequacy
11 쉼 □ n)urposes is consistent with the Energy Action Plan’s loading order. Sierra Club agrees
12 쉼 □ v)ith the Commission that DR programs that rely on fossil-fueled back-up generation
13 쉼 □ n)ontradict California’s DR vision and its loading order requirements, with or without
14 쉼 □ n)urcation, and that the Commission’s policy should apply in either case.

15 쉼 □ η The Natural Resources Defense Council has proposed a “retrofit, retire or
16 쉼 □ r)place” pilot program aimed at the dirtiest, pre-2000 BUGs, which includes replacement
17 쉼 □ v)ith storage technologies. Environmental Defense Fund has recommended a pilot
18 쉼 □ n)rogram to examine replacing fossil-fueled back-up generation with clean energy storage,
19 쉼 □ n)etworked into the grid. Sierra Club supports the consideration of these two pilots.

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1 쉼 □ Q. 273: In its Revised Scoping Order (Appendix A, page 2), the Commission asks
2 쉼 □ witnesses to comment on a list of measures proposed by PG&E to reduce
3 쉼 □ integration costs. Have you reviewed those measures?

4 쉼 □ Yes. Here is the relevant excerpt from PG&E’s comments:

5 쉼 □ There are several potential modifications to existing wholesale DR products that
6 쉼 □ could reduce the cost and operational risk of providing these products while still
7 쉼 □ meeting CAISO needs. Some examples are:

- 8 쉼 □ • Have PDR be called in an “all or nothing” manner (discrete) like RDRR
- 9 쉼 □ • Create a DLAP-level PDR product
- 10 쉼 □ • Simplify telemetry requirements
- 11 쉼 □ • Increase the minimum resource size for telemetry (now 10 MW)
- 12 쉼 □ • Simplify registration for mass market customers
- 13 쉼 □ • Ease master file update requirements for supply-side DR resources
- 14 쉼 □ • Eliminate the requirement to separate PDR participants by LSE
- 15 쉼 □ • Allow customers to be removed or added from a RDRR during a season (no
- 16 쉼 □ “lockdown” of customers for a season)
- 17 쉼 □ • Reduce the number of subLAPs and have subLAPs rollup to LCAs

18 쉼 □ On behalf of Sierra Club, and without commenting on each suggestion in the list,
19 쉼 □

20 쉼 □ I suggest that four of these measures appear to be especially meritorious, each of them
21 쉼 □

22 쉼 □ improving the “customer friendliness” of the DR offering. First, the CAISO should
23 쉼 □

24 쉼 □ simplify to the greatest degree possible the registration requirements for mass market
25 쉼 □

26 쉼 □ customers. Unlike DR aggregations with relatively few participants, performance for a
27 쉼 □

28 쉼 □ mass-market product has little to do with individual subscriptions, and instead is judged
29 쉼 □

30 쉼 □ by the (probabilistic but predictable) overall performance of the program. It is not
31 쉼 □

32 쉼 □ necessary for the CAISO to obtain detailed registration information for each individual
33 쉼 □

34 쉼 □ participant.

35 쉼 □ PG&E also recommends that CAISO relax its requirements that the customers in
36 쉼 □

37 쉼 □ a Reliability Demand Response offering be “locked in” for the period of the offer.
38 쉼 □

39 쉼 □
40 쉼 □

1 쉼 □ Similar to my last comment, this requirement seems unnecessary, since the offeror of the
2 쉼 □ PDR product remains obligated to deliver the contracted DR, even if the offeror
3 쉼 □ changes the composition of the list of actual customers who will provide the service.
4 쉼 □ CAISO need not know or register the identities of the actual participants – it is sufficient
5 쉼 □ to be able to hold the offeror to its commitment.

6 쉼 □ Next, the recommendation that CAISO eliminate the requirement of sorting PDR
7 쉼 □ participants by LSE seems reasonable. From CAISO’s perspective, it should be
8 쉼 □ sufficient to know the DR delivery point without identifying exactly which participant is
9 쉼 □ served by which LSE.

10 쉼 □ Finally, PG&E (and others before it) suggest that the number of subLAPs (23
11 쉼 □ statewide) might reasonably be collapsed into the 12 LCAs for purposes of bidding DR
12 쉼 □ into the CAISO market. Once again, this appears to be a reasonable recommendation,
13 쉼 □ subject to any (non-obvious) concerns that CAISO might have about this proposal.

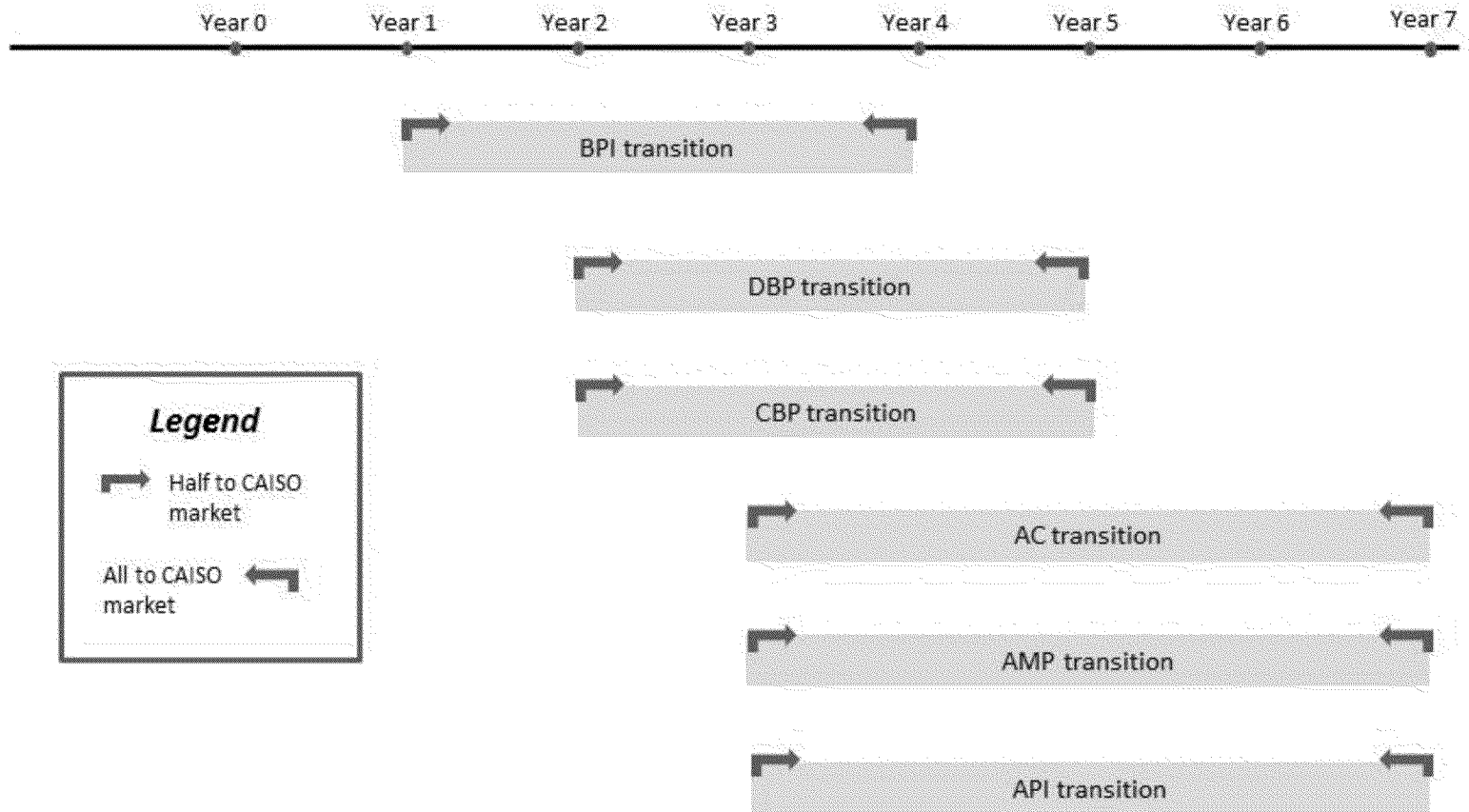
14 쉼 □ Q. 284: **Mr. Binz, does this conclude your testimony at this time?**

15 쉼 □ Yes, it does.

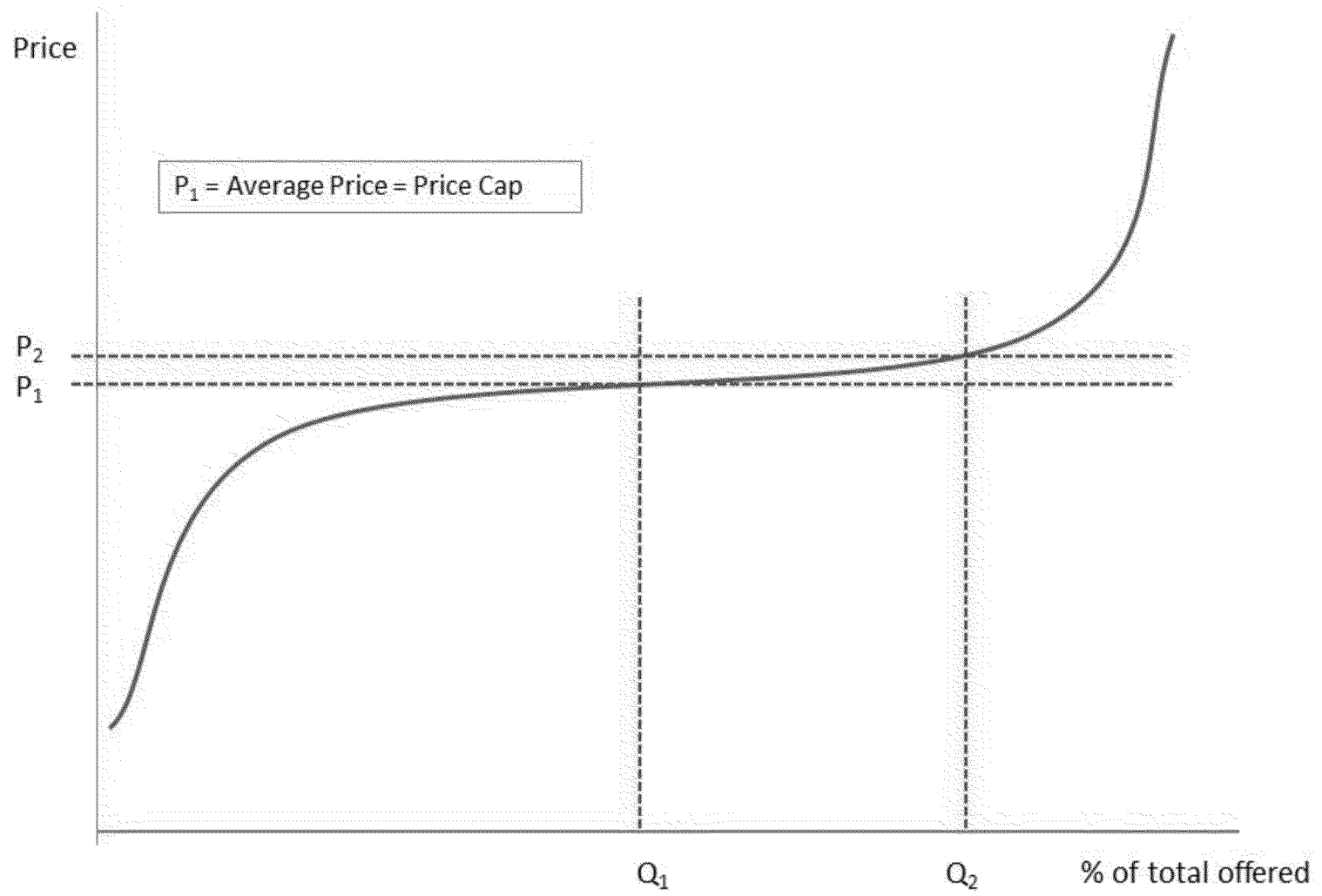
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DR Resource	Disposition
Supply DR	
BIP Base Interruptible Program	Half to CAISO in one year; balance within three years later
DBP Demand Billing Program	Half to CAISO in two years, balance within three years later
CBP Capacity Bidding Program	Half to CAISO in two years, balance within three years later
AC Cycling	Half to CAISO in three years, balance within three years later
AMP Aggregator Managed Program	Half to CAISO in three years, balance within three years later
API Agricultural Pumping Interruptible	Half to CAISO in three years, balance within three years later
Load Modifying DR	
CPP	
PLS Permanent Load Shifting	
RTP	
SLRP Scheduled Load Reduction	
OBMC Optional Binding Mandatory Curtailment	
ADR-I Automated Demand Response - Incentive	
PTR	
TOU	
Agricultural RTP	
Technology Incentives	

Sierra Club Proposed Timeline for Transition of Supply DR to CAISO Market



Shortcomings of DRAM Bid Cap Defined as Average Bid Price



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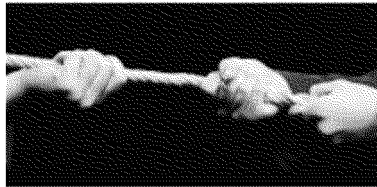
Conquering Consumer Resistance

TIME TO CROSS THE BRIDGE TO TIME-OF-USE RATES

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Ron Binz

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DYNAMIC PRICING FOR RESIDENTIAL ELECTRICITY use will bring significant advantages to utilities and their customers. The customer response elicited by time-of-use rates will lower overall system cost, to the benefit of all consumers. Properly implemented, time-of-use rates are fairer and will induce customers to use electricity more efficiently. There is no serious debate about these statements.

But utilities and their regulators have famously not moved toward dynamic pricing for residential customers in the United States. The reasons for this reluctance include concerns about the cost of metering and fears of consumer resistance. But the pressures to move to dynamic pricing are mounting and the foregone benefits are adding up. There are several ways in which regulators might introduce time-sensitive rates in a way that will be acceptable to consumers.

Time-of-use rates have always enjoyed theoretical support. But now there are several new, practical reasons why utilities and their regulators should move toward them.

Demand for electric vehicles will grow steadily over the next two decades. Some mechanism is needed to induce or require customers to charge vehicles during off-peak times. Today's time-insensitive residential prices will lead to higher system costs if customers plug in their vehicles after work, adding to the late-afternoon summertime peak load on generation and distribution systems. In the other direction, nighttime energy loads from EVs will be desirable by utilities with significant wind generation.

Residential adoption of distributed generation, especially small-scale solar systems, appears to be accelerating as the cost of systems fall and residential financing options grow. Unless electricity is priced on a time-sensitive basis, the correct value of such distributed generation to the utility system is obscured. Net metering at time-sensitive rates will increase payments to solar systems, permitting utilities to charge compensatory rates to solar customers for distribution service.

Time-of-use rates are essential to the new energy markets that will develop because of grid modernization. The deployment of smart meters and the arrival of intermediaries who operate between utilities and their customers will require rational retail pricing of electricity. Usage-sensitive pricing will stimulate the use of home energy management tools.

Energy efficiency and residential demand response will be enabled by the use of dynamic pricing, which will also be required by vehicle-to-grid transactions.

There may be non-price approaches to each of these challenges, involving separate metering of vehicles, solar panels and smart appliances. But only dynamic pricing addresses all four considerations simultaneously and consistently.

The Institute for Electric Efficiency reports that 27 million smart meters were installed in September 2011 and projects that 65 million will be in place by 2015, reaching 54 percent of all residential customers.

It is sometimes suggested that the best transition to dynamic pricing is to make it optional so that customers who benefit from the rate structure will subscribe. There are problems with this approach. First, it creates an immediate revenue shortfall for the utility, requiring that rates increase for the non-time-of-use rate customers. Further, the transition to the rates is likely to be very slow. Most customers do not have an acute sense of their energy use; in jurisdictions where the rates have been optional, few customers have subscribed.

These considerations lead to the following recommendation: Instead of making time-of-use rates optional for all customers, regulators should make them mandatory for the largest 15 to 20 percent of residential customers and optional for others.

Requiring the rates for the largest customers will not likely trigger widespread consumer resistance to the rates; it will be seen as fair for the largest customers on the system. This strategy will address a relatively large fraction of electric sales while affecting a relatively small percentage of customers. The largest 20 percent of residential consumers will account for about 40 percent of electricity sales.

This approach will be an effective way to break the ice on dynamic pricing. Some research suggests that most customers prefer time-of-use rates after they have experience with them. Following the introduction of the rates for the largest customers, with some socialization occurring as a result, voluntary subscription by smaller customers will likely increase.

The largest electricity users tend to be wealthier and have larger houses; as such, they are most likely to be early purchasers of electric vehicles and solar generation, and have large air-conditioning loads. Wealthier customers are more likely to adopt home energy management systems. If smart meters are not already installed in an area, time-of-use rates applied to only the largest customers will easily justify selective installation of smart meters for the affected customers.

Concerns about inter-customer equity can be allayed. The largest residential customers are qualitatively different from the smallest customers. For example, time-of-use meters can more easily be justified for large customers. Further, utilities and their regulators have long made distinctions in the rate structures of small and large commercial customers, based on customer demand levels. This proposal is the equivalent of creating an additional residential customer class based on usage. Finally, this proposal can be defended as a large-scale pilot: A commission can hold open the possibility of extending the rates to all residential customers, depending on the experience with the largest customers.

When introducing dynamic pricing to the largest members of the residential class, regulators and utilities have several choices for cost allocation and rate design. To keep matters simple, regulators should set initial dynamic prices at a level that recovers the same aggregate revenues from the set of customers being moved to the rates. Rate design should be simple: fixed prices for fixed time periods, possibly varying by season. More sophisticated rate designs such as real-time pricing can be explored later if desired. A possible variation would be the addition of a critical-peak pricing element, under which prices would rise sharply during a few hours of the year when system peak is especially high.

Consumer-side benefits of the smart grid have been elusive, held back by the traditional residential rate designs used throughout the country. Energy managers and smart devices make little sense when prices do not signal utility system costs. The proposal outlined here will help utilities and their regulators break the cycle with smart prices, enabling the development of a smarter consumer energy market.

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Employment History

2011-present Principal, Public Policy Consulting

Following my four year term on the Colorado Public Utilities Commission, I resumed my consulting practice in policy and regulation in energy and telecommunications markets. In the energy area, my focus is on climate, clean tech, regulatory reform, utility business models, integrated resource planning and smart grid. In telecommunications, my focus is on adapting regulation to deal effectively with today's markets, emphasizing policies that accelerate the deployment of broadband services.

Current and recent clients include Steffes Corporation, Posigen, Vivint Solar, Tendril Networks, Dow Solar, Lawrence Berkeley National Laboratory, Ceres, the Energy Regulatory Commission of Mexico, the U.S. Department of Energy, Environmental Defense Fund, Earth Justice, Blue Planet Foundation, the Future of Privacy Forum, American Efficient, and Conservation Colorado, among others.

2013 Nominee, Federal Energy Regulatory Commission

I was nominated by President Obama on June 27, 2013 to serve on the Federal Energy Regulatory Commission and, upon confirmation, to be designated as Chairman. My nomination was vigorously opposed by the coal industry and conservative political groups, who argued that I would be too friendly to low-carbon resources like renewable energy and energy efficiency. Following a confirmation hearing, it appeared unlikely that my nomination would be reported favorably by the Senate Energy and Natural Resources Committee. I therefore asked that my name be withdrawn from further consideration.

2011-2013 Senior Policy Advisor, Center for the New Energy Economy

The Center for the New Energy Economy (CNEE) at Colorado State University is headed by former Colorado Governor Bill Ritter, Jr. The Center provides policy makers, governors, planners and other decision makers with a road map to accelerate the nationwide development of a New Energy Economy.

2007-2011 Chairman, Colorado Public Utilities Commission

I was appointed by Governor Bill Ritter, Jr. in January 2007. As Chairman, I helped implement the Governor's and Legislature's vision of Colorado's New Energy Economy, implementing the state's 30% Renewable Energy Portfolio Standard, fulfilling the Commission's role in the Governor's Climate Action Plan, streamlining telecommunications regulation, promoting broadband telecommunications investment and improving the operation of the Commission.

Here are some major accomplishments during my term on the Commission:

- **Implementing the Clean Air-Clean Jobs Act (2010).** Following passage of this new law in 2010, the Commission worked under a very compressed time schedule to consider proposals by XcelEnergy and Black Hills Energy to reduce pollutants from their coal fired generation plants. The contentious Xcel proceeding involves thirty-four legal parties, testimony from sixty-one witnesses and the consideration of more than a dozen contending compliance plans. The case has required the close cooperation between the Commission and the Department of Public Health and Environment.
- **Implementing dozens of new energy, transportation and telecommunications laws.** In each legislative session during the term of Governor Ritter, the general assembly passed numerous utility-related laws. Many of these new laws require the Commission to adopt rules, compile reports, or conduct hearings. Rarely in Colorado history has there been this much activity required of the Commission.
- **Modifying and approving the electric resource plan of XcelEnergy (2009).** After extensive hearings, the Commission approved a plan that includes large amounts of new wind capacity, the early closure of two coal power plants to reduce carbon and other emissions, the acquisition of 200-600 megawatts of solar thermal capacity, and substantial amounts of new energy efficiency savings. The target portfolio will reduce CO₂ emissions per megawatt-hour by 22% from current levels by 2017. The Commission decision requires competitive acquisition for new resources.
- **Adopting new, aggressive energy efficiency requirements (2008)** for Colorado gas and electric utilities. The Commission's requirements for electric utilities go well beyond the statutory minimum levels enacted in 2007. The Commission's policies also provide for rapid cost recovery of energy efficiency spending and bonus incentives for superior performance for the utilities.
- **Rewriting the Commission's electric resource planning rules (2007)** to require full consideration of future costs for carbon emissions, new clean energy resources and environmental and economic externalities. Retained and refined the requirements for competitive acquisition of new resources.
- **Improving communications with stakeholders.** I successfully sought legislation to modify the Commission's enabling statute, allowing the use of a "permit-but-disclose"

communications process similar to the one employed successfully by the FCC and the FERC. The result has been much greater exposure of the Commissioners and staff (outside the hearing process) to the thinking of consumers, utilities, environmental advocates, large customers, advocates for new technologies, etc.

- **Organizing meetings of Western state regulators on regional transmission issues.** We discussed coordination in our efforts to add transmission capacity, especially to renewable energy zones. In future meetings we will discuss a goal of eliminating “pancaked” transmission pricing in the intermountain west.
- **Conducting hearings in eight towns around the state** on a “road trip” to collect consumer opinions about energy rates, distributed generation, the future of the energy sectors, and support for moving toward a more environmentally-sensitive utility industry.
- **Reorganizing the PUC’s staff** to create a Research and Emerging Issues section. As chairman, I worked to improve deployment of the agency’s modest staff so that the Commissioners could stay apprised of new technology and policy alternatives and be able to investigate and implement new regulatory approaches.
- **Reaching out to consumers and interest groups.** I frequently speak at meetings of consumer organizations, environmental groups, business and professional associations, legal seminars, etc. The two-way-street communications improves my understanding and conveys to the public the immense challenges we face in energy policy with climate change.

1995-2006 President, Public Policy Consulting

Consultant, specializing in energy and telecommunications regulatory policy issues. Assignments include strategic counsel to clients and research and testimony before regulatory and legislative bodies. In addition, I produced several research reports about the impact on rates of adding significant amounts of wind and solar capacity to utility systems. These reports are listed below.

I had a wide range of clients, including: consumer advocate offices, rural electric utilities, senior citizen advocacy groups, environmental groups, industrial electric users, homebuilders, building managers, telecommunications resellers, incumbent local exchange companies, low-income advocacy organizations, and municipal utilities. I testified as an expert witness before regulatory commissions in twelve states.

1996-2003 President and Policy Director, Competition Policy Institute

Competition Policy Institute was an independent non-profit organization that advocated for state and federal policies to bring competition to energy and telecommunications markets in ways that benefit consumers. Duties included: determining the organization’s policy position on a wide range of telecommunications and energy issues; conducted research, produced policy papers,

presented testimony in regulatory and legislative forums, hosted educational symposia for state regulators and state legislators.

1984-1995 Director, Colorado Office of Consumer Counsel

Director of Colorado's first state-funded utility consumer advocate office. By statute, the OCC represents residential, small business and agricultural utility consumers before state and federal regulatory agencies. The office was a party to more than two hundred legal cases before the Colorado Public Utilities Commission, the Federal Communications Commission, the Federal Energy Regulatory Commission and the courts.

Managed a staff of eleven, including attorneys, economists, and rate analysts who conduct economic, financial and engineering research in public utility matters. Testified as an expert witness on subjects of utility rates and regulation. Negotiated rate settlement agreements with utility companies. Regularly testified before the Colorado general assembly and spoke to professional business and consumer organizations on utility rate matters. Consulted with advisory board of consumer leaders from around the state.

Held leadership roles in National Association of State Utility Consumer Advocates. Member of high-level advisory boards to Federal Communications Commission (Network Reliability Council and North American Numbering Council) and Environmental Protection Agency (Acid Rain Advisory Council). Frequent witness before congressional committees and invited speaker before national industry and regulatory forums.

1977-1984 Consulting Utility Rate Analyst

Represented clients in public utility rate cases and testified as an expert witness in utility cases before regulatory commissions in Utah, Wyoming, Colorado and South Dakota. Clients included state and local governments, low income advocacy groups, irrigation farmers and consumer groups. Testimony spanned topics of telephone rate design, electric cost-of-service studies, avoided cost valuation of nuclear generation, electric rate design for irrigation customers and municipal water rate design.

1975-1984 Instructor in Mathematics

Taught mathematics at the University of Colorado, Denver and Boulder campuses. Nominated three times for outstanding part-time faculty member.

1971-1974 Manager, Blue Cross and Blue Shield

Managed major medical claims processing department. Responsibilities included budgets, hiring, training, managing supervisors, and coordinating with medical peer review committee.

Other Business Interests

1994-2011 Managing Partner, Trail Ridge Winery

Managing Partner and Secretary/Treasurer of Trail Ridge Winery. Trail Ridge Winery was located in Loveland, Colorado, and produced a variety of award-winning wines from Colorado-grown grapes.

Education

M.A. (Mathematics) 1977. University of Colorado. Course requirements met for Ph.D.

Graduate courses toward M.A. in Economics 1981-1984. University of Colorado. Twenty-seven hours including Economics of Regulated Industries, Natural Resource Economics, Econometrics.

B.A. with Honors (Philosophy) 1971. St. Louis University.

Diploma 1967. Catholic High School, Little Rock, Arkansas.

Professional Associations and Activities

Selected Current:

Brookings Institution, Non-resident Senior Fellow, 2013-present

Board of Directors, GRID Alternatives Colorado

Harvard Electric Policy Group, John F. Kennedy School, Harvard University 1994-present

Advisory Council to the Board of the Electric Power Research Institute (EPRI) 2008-2011

Keystone Energy Board 2009-2012

Aspen Institute for Humanistic Studies, Communications and Society Programs 1986-present

Selected Past:

National Association of Regulatory Utility Commissioners

Member, Energy Resources and Environment Committee 2007-2011

Member, International Relations Committee 2007-2011

Chair, NARUC Task Force on Climate Policy 2010-2011

President, Western Conference of Public Service Commissioners, 2010-2011

Acid Rain Advisory Council to the Environmental Protection Agency, circa 1991

American Association for the Advancement of Science

American Vintners Association (*now* WineAmerica), Executive Committee, Membership Chair

Colorado Common Cause, Board Member

Colorado Energy Assistance Foundation, Board Member, Past President

Colorado Legislative Task Force on Information Policy, Gubernatorial Appointee 2000-2001

Colorado Public Interest Research Foundation, Board Member

Colorado Telecommunications Working Group, Gubernatorial Appointee

Colorado Wine Industry Development Board, Chairman

Council on Economic Regulation, Past Fellow

Denver Mayor's Council on Telecommunications Policy

Exchange Carriers Standards Association Network Reliability Steering Committee

Legislative Commission on Low-Income Energy Assistance, Past President

National Association of State Utility Consumer Advocates

President 1991-1992, Vice-President 1990, Treasurer 1987-1989

Chair, Telecommunications Committee 1992-1995

Network Reliability Council to the Federal Communications Commission

New Mexico State University Public Utilities Program, Faculty and Advisory Council

North American Numbering Council to Federal Communications Commission, Co-Chair

Outreach Committee, Western States Coordinating Council Regional Planning Committee

Total Compensation Advisory Council to the State of Colorado Department of Personnel

Who's Who in Denver Business

Selected Regulatory Testimony

From 1977 to 2013, Mr. Binz participated in more than 150 regulatory proceedings before the Federal Communications Commission, the Federal Energy Regulatory Commission, State and Federal District Courts, the 8th Circuit, 10th Circuit and D.C. Circuit Courts of Appeal, the U.S. Supreme Court and state regulatory commissions in California, Colorado, Georgia, Idaho, Maine, Missouri, New York, North Dakota, South Dakota, Texas, Utah, and Wyoming. He has filed testimony in approximately sixty proceedings before these bodies. His testimony and comments have addressed a wide variety of technical and policy issues in telecommunications, electricity, natural gas and water regulation.

Before the Public Service Commission of Wyoming. In The Matter of Rocky Mountain Power's Confidential Contract Filing Docket No. 20000-379-EK-10 of a Purchase Power Agreement between PacifiCorp and Pioneer Wind Park I. Binz Affidavit on behalf of Northern Laramie Range Alliance. Record No. 12618 (August 2011)

Before the West Virginia Public Service Commission. In The Matter Of the Petition of Verizon West Virginia, Inc. To Cease Rate Regulation of Certain Workably Competitive Telecommunications Services. Case No. 06-0481-T-PacifiCorp (June 2006)

Before the Utah Public Service Commission. In The Matter Of The Division's Annual Review and Evaluation of Electric Lifeline Program, HELP Rate Design Testimony. Docket No. 04-035-21 (September 2005)

Before the Colorado Public Utilities Commission. Testimony on behalf of YMCA of the Rockies. In re: YMCA of the Rockies, Complainant v. Xcel Energy (d/b/a Public Service Company of Colorado, Respondent. Rebuttal Testimony. Docket No. 05F-167G. (September 2005)

Before the Colorado Public Utilities Commission. Testimony on behalf of YMCA of the Rockies. In re: YMCA of the Rockies, Complainant v. Xcel Energy (d/b/a Public Service Company of Colorado, Respondent. Direct Testimony. Docket No. 05F-167G. (June 2005)

Before the Michigan Public Service Commission. Testimony on behalf of the Michigan Attorney General. In The Matter Of SBC Michigan's Request For Classification Of Business Local Exchange Service As Competitive Pursuant To Section 208 Of The Michigan Telecommunications Act. Case No. U-14323. (March 2005)

Before the Colorado Public Utilities Commission. Testimony on behalf of the Colorado Office of Consumer Counsel. In the Matter of the Combined Application of Qwest Corporation for Reclassification and Deregulation of Certain Part 2 Products and Services and Deregulation of Certain Part 3 Products and Services. Docket No. 04A-411T. (February 2005)

Before the Utah Public Service Commission. In The Matter Of the Application of PacifiCorp for Approval of Its Proposed Electric Rate Schedules and Electric Service Regulation. Rate Design Testimony. Docket No. 04-035-42. (January 2005)

Before the Utah Public Service Commission. In The Matter Of the Application of PacifiCorp for Approval of Its Proposed Electric Rate Schedules and Electric Service Regulation. Revenue Requirements Testimony. Docket No. 04-035-42. (December 2004)

Before the Colorado Public Utilities Commission. Testimony on behalf of the Building Owners and Managers Association of Metropolitan Denver (BOMA) in the Matter of The Investigation And Suspension Of Tariff Sheets Filed By Public Service Company Of Colorado With Advice Letter No. 1411—Electric Docket No. 04S-164E (October 2004)

Before the Colorado Public Utilities Commission. Testimony on behalf of Colorado Energy Consumers in the Matter of The Application of Public Service Company of Colorado for Approval of its 2003 Least-Cost Resource Plan. Docket No. 04A-214E (filed: September 2004)

Before the Colorado Public Utilities Commission. Testimony on behalf of Colorado Energy Consumers in the Matter of the Application of Public Service Company of Colorado For An Order Authorizing It To Implement A Purchased Capacity Cost Adjustment Rider In Its PUC No. 7 – Electric Tariff. Docket No. 03A-436E. (Filed: March 2004)

Before the Wyoming Public Service Commission. Testimony on behalf of Wyoming Industrial Energy Consumers (WIEC) and AARP In the Matter of the Application of PacifiCorp for Approval of a Power Cost Adjustment Mechanism. Docket No. 20000- ET-03-205 (filed: January 2004).

Before the Colorado Public Utilities Commission. Testimony on behalf of the Colorado Office of Consumer Counsel Regarding The Unbundling Obligations Of Incumbent Local Exchange Carriers Pursuant To The Triennial Review Order – Initial Commission Review. Docket No. 03I-478T. (January 2004)

Before the Wyoming Public Service Commission. Testimony on behalf of AARP in the matter of The Application Of PacifiCorp For A Retail Electric Utility Rate Increase Of \$41.8 Million Per Year Docket No. 20000-ER-03-198 (January 2004).

Before the Wyoming Public Service Commission. Public hearings testimony on behalf of AARP in the matter of an application by Kinder Morgan to modify the provider selection process in its Choice Gas Program. (December 2003).

Before the Public Service Commission of North Dakota. Testimony on behalf of AARP in the matter of In the Matter of the Notice of Montana-Dakota Utilities Co. for an Electric Rate Change. Case No. PU-399-03-296. (October 2003)

Before the Colorado Public Utilities Commission. Testimony in the matter of Public Service Company of Colorado's Advice Letter No. 598 – Natural Gas Extension Policy. Docket No. 02S-574G. (March 2003)

Before the Colorado Public Utilities Commission. Testimony in the remand hearings in the formal complaint case of the Homebuilders Association of Metropolitan Denver against Public Service Company. Docket 01F-071G. (January 2003)

Before the Wyoming Public Service Commission. Testimony on behalf of AARP in the matter of an application by PacifiCorp to increase rates, recover excess net power costs, and recover purchase power costs related to the Hunter Unit 1 outage. Docket No. 20000-ER-02-184. Testimony Concerning A Proposed General Rate Increase And Surcharge For Previous Power Costs. (November 2002).

Before the Wyoming Public Service Commission. Testimony on behalf of AARP in the matter of an application by PacifiCorp to increase rates, recover excess net power costs, and recover purchase power costs related to the Hunter Unit 1 outage. Docket No. 20000-ER-02-184. Testimony Concerning Hunter Unit 1 Issues. (November 2002).

Before the Colorado Public Utilities Commission.. Comments on behalf of the Colorado Energy Assistance Foundation. Docket No. 02R-196G. In the Matter of the Proposed Repeal and Reenactment of the Rules Regulating Gas Utilities. (November 2002)

Before the Colorado Public Utilities Commission.. Testimony on behalf of Colorado Energy Assistance Foundation and Catholic Charities of the Archdiocese of Denver. Docket No. 02A-158E. In the Matter of the Application of Public Service Company of Colorado for an Order to Revise its Incentive Cost Adjustment. (April 2002)

Before the Idaho Public Utilities Commission. Testimony on behalf of Astaris, in the matter of Case No. IPC-E-01-43 concerning the buy-back rates under an electric load reduction program. (January 2002)

Before the Colorado Public Utilities Commission. Testimony in matter of the investigation of Advice Letters 579 and 581 of Xcel Energy on behalf of Homebuilders Association of Denver. Dockets 01S-365G and 01S-404G. (January 2002)

Before the Colorado Public Utilities Commission. Testimony in the formal complaint case of the Homebuilders Association of Metropolitan Denver against Public Service Company. Docket 01F-071G. (August 2001)

Before the Colorado Public Utilities Commission. Testimony in the matter of the investigation and suspension of Advice Letter No. 566 of Xcel Energy on behalf of the Homebuilders Association of Metropolitan Denver. Docket No. 00S-422G. (November 2000)

Before the American Arbitration Association. In the Matter of Univance Telecommunications, Inc. v. Venture Group Enterprises, Inc. Arbitration No. 77 Y 147 00099 00 (November 2000)

Testimony of Ronald Binz at FCC Public Forum on SBC/Ameritech merger (May 1999)

Docket No. 97-106-TC -- Testimony of Ron Binz before New Mexico State Corporation Commission on Investigation Concerning USWest's Compliance with Section 271(c) of the Telecommunications Act (July 1998)

Before the Colorado Public Utilities Commission. Testimony Concerning the Investigation of Telephone Numbering Policies. (March 1998)
Docket No. 6717-U

C Testimony before the Georgia Public Service Commission Concerning the Service Provider Selection Plan of Atlanta Gas Company. (January 1997)

Case 96-C-0603 and Case 96-C-0599--Testimony of Ronald J. Binz on behalf of CPI before the New York State Public Service Commission concerning the Bell Atlantic/NYNEX Merger (November 1996)

Docket No. 96-388 - Direct Testimony of Ronald J. Binz, CPI, On Behalf of the Office of the Public Advocate (October 1996) State of Maine, Public Utilities Commission Joint Petition of New England Telephone and Telegraph Company and NYNEX Corporation for Approval of the Proposed Merger of a Wholly-Owned Subsidiary of Bell Atlantic Corporation into NYNEX Corporation.

Application No. 96-04-038 - Direct Testimony of Ronald J. Binz, CPI, On Behalf of Intervener, Utility Consumers Action Network (September 1996) Before the Public Utilities Commission of the State of California In the Matter of the Joint Application of Pacific Telesis Group (Telesis) and SBC Communications (SBC) for SBC to Control Pacific Bell (U 1001 C), Which Will Occur Indirectly as a Result of Telesis' Merger With a Wholly Owned Subsidiary of SBC, SBC Communications (NV) Inc.

Presentation to Federal-State Joint Board on Universal Service (April 12, 1996)

Testimony before the Texas Public Utility Commission on the Integrated Resource Planning Rule (March, 1996)

Congressional Testimony

Mr. Binz has appeared sixteen times before U.S. House and Senate Committees. In addition, he has testified numerous times before state legislatures in several states. Here is a list of his U.S. Congressional testimony and statements:

United States Senate Energy and Natural Resources Committee, 2013. Statement in support of my nomination to the Federal Energy Regulatory Commission.

United States House of Representatives Commerce Committee, Energy Subcommittee, 2008. Testimony concerned a proposal to adopt a federal renewable energy standard.

United States House of Representatives Judiciary Committee, November 1999. Testimony concerning H.R. 2533, The Fairness in Telecommunications License Transfer Act of 1999.

United States Senate Judiciary Committee; Antitrust, Business Rights and Competition Subcommittee, April 1999. Testimony concerning S.467, The Antitrust Merger Review Act.

United States Senate Commerce Committee, Telecommunications Subcommittee, May 1998. Testimony in oversight hearings concerning the performance of the Common Carrier Bureau of the Federal Communications Commission.

United States Senate Judiciary Committee, Washington, D.C., September 1996. Presented testimony on behalf of the Competition Policy Institute on the competitive impact of proposed mergers of Regional Bell Operating Companies.

United States House of Representatives Subcommittee on Telecommunications and Finance of the Committee on Commerce, May 1995. Testimony presenting NASUCA's position on H.R. 1555 by Representative Fields.

United States Senate Subcommittee on Antitrust, Washington, D.C., September 1994. Testimony presenting NASUCA's position on S. 1822 by Senator Hollings.

United States House of Representatives Subcommittee on Telecommunications and Finance of the House Energy and Commerce Committee, Washington, D.C., February 1994. Presented testimony on H.R. 3636.

United States House of Representatives Subcommittee on Economics and Commercial Law, Washington, D.C., October 1992. Supplemental testimony presenting NASUCA's position on legislation concerning the Modified Final Judgment introduced by Representative Brooks.

United States House of Representatives Subcommittee on Telecommunications and Finance, Washington, D.C., October 1991. Testimony on RBOC entry into telecommunications manufacturing and information services.

United States House of Representatives Subcommittee on Economics and Commercial Law, Washington, D.C., August 1991. Testimony presenting NASUCA's position on possible federal legislation concerning the Modified Final Judgment.

United States Senate Subcommittee on Energy Regulation and Conservation, Denver, Colorado, April 1991. Testimony presenting NASUCA's position on federal legislation concerning regulation of the natural gas industry, introduced by Senator Wirth.

United States Senate Communications Subcommittee, Washington, D.C., February 1991. Testimony on behalf of NASUCA concerning S.173, telecommunications legislation introduced by Senator Ernest Hollings.

United States Senate Communications Subcommittee, Washington, D.C., July 1990. Testimony on behalf of NASUCA concerning S.2800, telecommunications legislation introduced by Senator Conrad Burns.

United States House of Representatives Subcommittee on Telecommunications and Finance, July 1988. Testimony on the FCC Price Cap proposal.

Reports and Articles

Title	Publisher	Date
<i>Priorities after FERC Overture</i>	EnergyBiz Magazine	Jan-Feb 2014
<i>Risk-Aware Planning and a New Model for the Utility-Regulator Relationship</i>	ElectricityPolicy.com	July 2012
<i>Practicing Risk Aware Electricity Regulation: What Every State Regulator Needs to Know</i>	Ceres	April 2012
<i>Conquering Consumer Resistance: Time to cross the bridge to time-of-use rates</i>	EnergyBiz Magazine	March-April 2012
<i>Cap and Innovate: An alternative approach to climate regulation.</i>	Public Utilities Fortnightly	June 2010
<i>Wind on the Public Service Company of Colorado System: Cost Comparison to Natural Gas</i>	Interwest Energy Alliance (with Jane Pater)	August 2006
<i>The Impact of the Renewable Energy Standard in Amendment 37 on Electric Rates in Colorado</i>	Public Policy Consulting	September 2004
<i>The Impact a Renewable Energy Portfolio Standard On Retail Electric Rates In Colorado</i>	Public Policy Consulting	February 2004
<i>Qwest, Consumers and Long Distance Entry: A Discussion Paper</i>	Public Policy Consulting	October 2001
<i>Addressing Market Power: The next step in electric restructuring</i>	Competition Policy Institute	June 1998
<i>Navigating a Course to Competition: A consumer perspective on electric restructuring</i>	Competition Policy Institute	August 1997

VERIFICATION

I am the witness for the Sierra Club in R.13-09-011. The statements in the foregoing

TESTIMONY AND EXHIBITS OF RONALD J. BINZ ON BEHALF OF SIERRA CLUB

are true of my knowledge, except as to matters stated on information and belief, and as to those matters, I believe them to be true.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on May 5, 2014, at Denver, Colorado.

A black rectangular box containing a white, handwritten signature that reads "Ronald J. Binz".

Ronald J. Binz

Consultant and Witness for the Sierra Club