

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

**In the Matter of the Application of
Northern States Power Company for
Authority to Increase Rates for
Electric Service in Minnesota**

**Docket E002/GR-13-868
OAH Docket No. 68-2500-31182**

REBUTTAL TESTIMONY

OF

PAUL CHERNICK

ON BEHALF OF

SIERRA CLUB,

MINNESOTA CENTER FOR ENVIRONMENTAL ADVOCACY,

FRESH ENERGY,

NATURAL RESOURCES DEFENSE COUNCIL, AND

IZAACK WALTON LEAGUE MIDWEST OFFICE

(“CLEAN ENERGY INTERVENORS”)

RESOURCE INSIGHT, INC.

JULY 7, 2014

TABLE OF CONTENTS

I. Introduction..... 1
II. Estimating Customer Costs..... 4
III. Approaches to Rate Design 8

1 **I. INTRODUCTION**

2 **Q: Are you the same Paul Chernick who sponsored direct testimony in this**
3 **proceeding?**

4 A: Yes.

5 **Q: What is the purpose of your rebuttal testimony?**

6 A: I respond to statements regarding the residential customer charge in the direct
7 testimony of Susan L. Peirce for the Department of Commerce (“DOC”), as well
8 as the testimony of DOC Witness Samir Ouanes on which Ms. Peirce relies. I
9 also comment on the testimony of Office of Attorney General Witness Ron
10 Nelson regarding the residential customer charge.

11 **Q: To what points will you be responding?**

12 A: I offer clarification and rebuttal regarding several points made by Ms. Peirce in
13 her testimony on the residential customer charge. Ms. Peirce supports an in-
14 crease in the residential customer charge that is smaller than that proposed by
15 Xcel (50¢/month, rather than \$1.25), due to concerns about continuity and
16 gradualism in ratesetting, as well as consistency with other utilities.

17 While she takes a more reasonable position than Xcel does with regard to
18 the customer charge increase in this proceeding, she accepts Xcel’s estimate of
19 \$15.86/month for customer-related costs as an appropriate target for future rate
20 design and describes the failure to set the customer charge at that level as an
21 “intra-class subsidy.” She asserts that the subsidy arises “when the proposed rate
22 for a service [in this case, connecting, metering and billing a customer] does not
23 recover the costs of providing that service.” She concludes,

1 ...customers who use less energy than average will not pay for their
2 share of customer costs while customers with higher monthly usage
3 will pay not only for their share of customer costs but will also pay
4 for the costs low-use customers did not pay. Thus, higher usage
5 customers pay for customer costs through their customer charge, as
6 well as the extra customer costs included in the energy charge for
7 customer costs they do not impose on the system. The result is that
8 these customers subsidize the revenue that would otherwise have
9 been collected in a monthly customer charge from low-usage
10 customers. (Peirce Direct p. 14)

11 Ms. Peirce “recommends that the Commission promote goals of fairness
12 and provide appropriate price information by adopting rates that are based on
13 cost, as much as possible” (p. 16), by which she appears to mean that the Com-
14 mission should raise the customer charges until they equal Xcel’s estimate of
15 customer costs. She also asserts:

16 Customers using less than 600 kWh will be subsidized by households
17 using more than that amount each month. (p. 19 ll. 6–8)

18 ...at 400 kWh of usage per month, revenues fall \$2.95 short of the
19 *necessary* \$7.86 in customer costs *needed* to be recovered from the
20 energy charge. (p. 19ll. 10–11, emphasis added)

21 ...customers with higher usage levels, some of whom are households
22 with low incomes, are subsidizing the customer costs of lower usage
23 households that may have average or high incomes. (p. 19 ll. 15–17)¹

24 Finally, Ms. Peirce expresses her concern that “customers who are not able
25 to invest in energy conservation to reduce their energy use” would be disad-
26 vantaged by customer charges below the cost level estimated by Xcel (p. 15ll.
27 20–21).

¹I will not be commenting on Ms. Pierce’s speculations on the relationship between energy usage and income level. EnergyCents witness Roger Colton addressed that issue in his direct testimony, and Ms. Pierce provides no evidence that low-income customers use more energy than high-income customers.

1 **Q: Does Ms. Peirce provide any independent analysis supporting customer**
2 **charges higher than the current charges?**

3 A: No. Ms. Peirce relies solely on calculations provided by Xcel and has not
4 performed any independent analysis or critical review of the assumptions under-
5 lying Xcel's calculations

6 **Q: Does Mr. Nelson use the same approach as Ms. Peirce?**

7 A: In some respects, his approach is quite different. Most importantly, he points out
8 some errors in Xcel's classification of distribution costs and recommends a
9 lower total customer classification in the residential class (Nelson Direct at 13-
10 26).² However, he does appear to accept at some level Xcel's assertion that the
11 costs classified as customer-related are the fixed costs of serving each customer.
12 As I discuss below, not all costs that may be classified as customer-related will
13 vary proportionally with the number of customers who choose to take service
14 from the utility. A large customer will tend to contribute more to some customer
15 costs than will a small customer.³

²The minimum-system approach is even more deeply flawed than Mr. Nelson recognizes, since it does not reasonably reflect the drivers of the number of transformers, poles or feet of conductor on the system. Voltage drop (a function of demand) determines the allowable distance from transformer to customer, and utilities tend to add transformers as demand rises (serving fewer customers from each transformer, or installing the transformers in banks for large customers). As demand rises, conductors are often deployed in parallel, in 3-phase distribution and in multiple feeder circuits, so conductor length varies with load. And the decision to expand a distribution system is almost always driven in part by expected revenues, which depend more on energy usage (and for large general service, billed demand) than on customer number.

³Non-varying costs might be classified as customer-related for lack of a better measure of class contribution to the cost.

1 **Q: Please summarize the problems in the DOC testimony on customer charges**
2 **that you will highlight in the remainder of your testimony.**

3 A: The principal problems are as follows:

- 4 • Ms. Peirce uses Xcel’s overstated estimate of customer costs to determine
5 appropriate adjustments in the customer charge.
- 6 • Ms. Peirce’s conclusions are based primarily on an exaggerated and mis-
7 placed concern about “intra-class subsidies.”

8 **II. ESTIMATING CUSTOMER COSTS**

9 **Q: How did Ms. Peirce estimate the customer costs that she compared to the**
10 **customer charges?**

11 A: Ms. Peirce did not estimate customer costs. She simply relied on the Xcel
12 estimates. In response to Information Request No. 5 from MCEA, Ms. Peirce
13 states: “I rely on Xcel’s calculation of its customer costs in its CCOSS.
14 According to Xcel’s CCOSS, the average residential cost is \$15.86 per month”
15 (MCEA/DOC IR 5; see also MCEA/DOC IR 1).

16 **Q: Did Ms. Peirce rely on a review of the Xcel estimates by another DOC**
17 **witness?**

18 A: Ms. Peirce states, “Xcel’s customer-related costs...are developed in the testi-
19 mony of Xcel Witness Michael Peppin, and reviewed by Department Witness,
20 Dr. Samir Ouanes” (MCEA/DOC IR 2).

21 **Q: What is the extent of the review of Xcel’s estimate of customer costs in Dr.**
22 **Ouanes’s testimony?**

23 A: Dr. Ouanes’s testimony does not review Xcel’s estimate of customer costs. The
24 only reference to customer costs I found in his testimony was the following:

1 Customer costs are those operating and capital costs found to vary
2 with the number of customers regardless of the customers' energy
3 consumption. They include the costs of metering, billing, tracking
4 accounts and responding to customer questions. (Ouanes Direct, p. 19
5 ll. 17–20)⁴

6 **Q: Has the Department provided any critical assessment of the customer cost**
7 **value provided by Xcel?**

8 A: No.

9 **Q: Does Ms. Peirce demonstrate that she understands the scope of costs that**
10 **Xcel includes in its estimate of customer costs?**

11 A: No. As I noted in my direct testimony (p. 28), Xcel's customer-cost computation
12 includes distribution costs that are not driven by the number of customers. Xcel
13 includes in the customer cost 73% of the distribution-line costs, 59% of the line-
14 transformer costs, and 77% of service-line costs allocated to the residential
15 class, in addition to the customer-service costs.

16 Ms. Peirce does not appear to recognize that such costs are included in
17 Xcel's estimate of the customer charge. When asked if she includes as customer
18 costs some cost components that are "not avoided by a customer leaving the
19 utility system," Ms. Peirce responded as follows:

20 The premise of the question that customer costs would not be avoided
21 by a customer leaving the system is unclear, since customer costs of
22 metering, billing, customer service and ongoing operation and
23 maintenance of the customer's connection to the system would be
24 avoided. (MCEA/DOC IR 1c)

⁴Note that Dr. Ouanes's list of customer costs does not include the distribution system, or even the service drop, and it is thus more similar to the computation in MCEA IR 21 (discussed on page 29 of my direct testimony) than to Xcel's overstated estimate of customer costs.

1 **Q: How is this response inconsistent with the Xcel customer-classified costs**
2 **that Ms. Peirce used?**

3 A: Ms. Peirce describes Xcel’s customer cost totals from the CCOSS as if they
4 include only “metering, billing, customer service and ongoing operation and
5 maintenance of the customer’s connection to the system,” even though the Xcel
6 costs also include O&M for much more than the service drop (“the customer’s
7 connection to the system”), and sunk capital costs for large amounts of joint
8 plant that serves other customers.⁵

9 Ms. Peirce does recognize that the Xcel CCOSS may include costs not
10 driven by the addition or retention of individual customers:

11 ...since I am relying on the CCOSS embedded average cost, if there
12 are any such costs that are not avoided by a single customer leaving
13 the system, those costs would continue to be treated as customer
14 costs, rather than being assigned to a different category.
15 (MCEA/DOC IR 1c)

16 In fact, a large portion of Xcel’s estimate of customer costs consists of costs not
17 driven by customer number.

18 Xcel chooses to classify a wide range of costs as customer-related for
19 purposes of the CCOSS. Many of those costs are classified as customer-related,
20 not because they are driven by the number of customers on the system, but
21 because Xcel has not identified a better classification factor to split among
22 classes the costs of spanning the service territory. As Bonbright, Danielsen, and
23 Kamerschen put it, these include area-spanning costs that are fundamentally
24 “unassignable”:⁶

⁵As I noted in my direct testimony (p. 27), Xcel does not normally remove any equipment when a customer leaves the system.

⁶Bonbright, James, Albert Danielsen, and David Kamerschen. 1988. *Principles of Public Utility Rates* 2nd Ed. Arlington, Va.: Public Utilities Reports.

1 the inclusion of the costs of a minimum-sized distribution system
2 among the customer-related costs seems to us clearly indefensible....
3 [Cost analysts are] under impelling pressure to fudge their cost
4 apportionments by using the category of customer costs as a dumping
5 ground.... (pp. 491–492)

6 Even were it “necessary” to set the fixed monthly charge to recover the
7 contribution of a minimal-size customer to non-load-related costs, Ms. Peirce’s
8 testimony suggests that she agrees the relevant costs should be limited to the
9 avoidable costs of metering, billing, customer service and service-drop
10 maintenance. That avoidable cost relevant to rate design is less than 40% of the
11 total cost that Xcel classifies as customer-related and includes in its \$15.86
12 monthly estimate of residential customer cost.

13 **Q: What are the monthly costs of the cost categories Ms. Peirce identified as**
14 **appropriate for inclusion in customer charges in MCEA/DOC IR 1?**

15 A: In MCEA/DOC IR 1 Ms. Peirce identified “metering, billing, customer service
16 and ongoing operation and maintenance of the customer’s connection to the
17 system” as appropriate for including in the customer charge. In Response
18 MCEA IR 21 Xcel computed customer costs including Ms. Peirce’s cost cate-
19 gories, plus transformers and the capital cost of service drops, and finds costs of
20 \$6.51/month for the residential class and \$8.61/month for the small commercial
21 class.⁷ Removing the transformers and service-drop costs, Ms. Peirce’s cus-

⁷Xcel’s computations also ignore the economies of scale in billing and customer service, estimating the cost per customer as the average cost rather than the marginal cost of an additional customer or 1% change in customer number. For example, while some billing costs (e.g., postage and stationery) vary linearly with customer number, the costs of the billing system are largely fixed and independent of customer number over a very wide range. The truly marginal cost of serving one more customer is probably much lower than Xcel’s average-cost estimate.

1 tommer-charge categories would total something between \$5 and \$5.50 per month
2 for the residential class.⁸

3 **Q: How would Ms. Peirce's conclusions change had she treated as customer**
4 **costs only those costs she believes are appropriately included in the**
5 **customer charge, as she lists in MCEA/DOC-1c?**

6 A: Had Ms. Peirce used the MCEA IR-21 residential cost of \$6.51/month in her
7 Tables 6 and 8 (or the even lower cost from the categories she lists) she would
8 have concluded that small residential customers are already paying more than
9 the costs required by their remaining as customers, so large customers are not
10 subsidizing them. Moving the existing monthly customer charges toward a
11 customer cost that included only Ms. Peirce's cost categories would require a
12 reduction of the customer charges, not an increase.

13 **III. APPROACHES TO RATE DESIGN**

14 **Q: Do you agree with Ms. Peirce's approach to rate design?**

15 A: No. Ms. Peirce's approach is too narrow and focuses too heavily on the
16 allocation of costs, rather than the design of a cost structure than can further the
17 statutory goals of affordability and conservation.

⁸Line transformers and service drops comprise about 75% of the capital costs in MCEA IR-21. The return on capital is about 27% of the MCEA IR-21 residential revenue requirements, so the transformer and service return would be about 21% of the revenue requirements. Transformer and service depreciation expense and transformer maintenance and property taxes, comprise another 7% or so of the MCEA IR-21 residential revenue requirements.

1 **Q: What are your specific concerns about the Department’s approach to rate**
2 **design in this proceeding?**

3 A: Ms. Peirce’s testimony treats rate design as if it only concerned the equitable
4 allocation of costs between customers, as a matter of dividing up a fixed set of
5 revenue requirements. This is a reasonable approach for class cost allocation,
6 but not for rate design. On an inter-class basis, the cost-of-service study is
7 intended to equitably divide revenue responsibility into portions to be recovered
8 from various classes. The total size of the bucket of costs allocated to a class
9 does not directly affect the behavior of customers, so there is little basis other
10 than equity for class cost allocation.

11 Once revenue requirements are determined and allocated to classes, the
12 considerations in designing rates are very different from those that drive class
13 cost allocation. The determination of actual rate components represents the
14 utility’s major opportunity to influence customer decisions. While revenue
15 requirements are *determined* and costs are *allocated*, rates are *designed* to tie
16 together costs and customer behavior. Subject to the major constraint that rates
17 must collect the class’s assigned revenue requirement, rates should be designed
18 to provide price signals for customer behavior.⁹ In some cases, equitable
19 treatment among and between various sub-groups within the class may also be
20 relevant as secondary considerations.

⁹Assuming that Xcel’s decoupling proposal (or something similar) is adopted, the collection of the class’s revenue requirement is not in doubt, but rates should still be designed to minimize the need for large decoupling adjustments. There are other constraints on rate design (e.g., avoiding rate shocks and customer confusion) that primarily influence the timing and presentation of rate changes, rather than the ultimate goals of rate design.

1 **Q: How are these considerations treated in Minnesota law?**

2 A: Minnesota statutes specifically prioritize as rate design objectives the conserva-
3 tion of energy and the increase of renewable sources and customer-side genera-
4 tion. Section 216B.03 requires,

5 To the maximum reasonable extent, the commission shall set rates to
6 encourage energy conservation and renewable energy use and to
7 further the goals of sections 216B.164, 216B.241, and 216C.05.

8 In turn those sections require, among other things, the following:

- 9 • Section 216B.164 states “the intent to give the maximum possible
10 encouragement to cogeneration and small power production consistent
11 with protection of the ratepayers and the public” and establishes net
12 metering for renewable and high-efficiency distributed generation. Higher
13 energy charges will increase the encouragement of net metered facilities
14 and other behind-the-meter generation.
- 15 • Section 216B.241 establishes an “annual energy-savings goal equivalent to
16 1.5 percent of gross annual retail energy sales” and a cost-benefit test of
17 whether an efficiency “improvement will result in energy savings at a total
18 cost to the utility less than the cost to the utility to produce or purchase an
19 equivalent amount of new supply of energy.” Since higher energy charges
20 reduce the payback period for participating customers, higher energy
21 charges will tend to increase the amount of efficiency that passes the cost-
22 benefit test.
- 23 • Section 216C.05 declares
24 “that continued growth in demand for energy will cause severe
25 social and economic dislocations, and that the state has a vital
26 interest in providing for increased efficiency in energy
27 consumption [and] the development and use of renewable
28 energy resources wherever possible,

1 and

2 “It is the energy policy of the state of Minnesota that annual
3 energy savings equal to at least 1.5 percent of annual retail
4 energy sales of electricity...be achieved through cost-effective
5 energy efficiency.

6 In contrast to these mandates for incentives to reduce energy use, Section
7 216B.03 only generally requires that “[r]ates shall not be unreasonably prefer-
8 ential, unreasonably prejudicial, or discriminatory, but shall be sufficient, equit-
9 able, and consistent in application to a class of consumers.” Other than suffi-
10 ciency (the requirement that the rates produce the required revenues), these are
11 very broad, subjective standards. Based on this language, I infer that the Minne-
12 sota legislature expects rate design to involve some preferences and even pre-
13 judices, so long as they are not unreasonable.

14 **Q: What costs are most relevant to rate design, based on the statutory directive**
15 **to use rate design to encourage conservation?**

16 A: Since customer reaction to price signals changes Xcel’s costs at the margin, rate
17 design should be based principally on the marginal costs of adding or retaining a
18 customer (or 10,000 customers scattered across the service territory), or using
19 one more kWh or one fewer kWh (or 1% more or less energy). Sunk costs that
20 will not be affected by customer behavior (e.g., the fixed costs of a billing sys-
21 tem than can produce 100,000 or five million bills a month, the costs of existing
22 distribution poles and transmission towers, recovery of above-market costs of
23 existing generation resources) should affect rate design only by affecting the
24 total revenues the rate collects, rather than prescribing the level of specific rates.

25 To the extent feasible, residential energy charges should recover the full
26 cost of incremental usage, including fuel, purchased power, variable O&M,

1 emission allowances, generation capital investments and fixed O&M (to provide
2 reliability, environmental compliance, improve efficiency, or allow for the use of
3 lower-cost fuels), transmission-and-distribution capacity, and line losses. While
4 ideally the fixed customer charge will recover the marginal cost of a small
5 customer, for metering, billing, and related functions this consideration is less
6 important than ensuring that energy charges provide sufficient incentives for
7 conservation.

8 **Q: Why is it more important to reflect marginal costs in the energy charge**
9 **than in the customer charge?**

10 A: Rate design matters primarily when it changes customer behavior or reflects the
11 changes in costs due to changes in customer behavior. Thus, energy costs (in-
12 cluding seasonal and time-of-use variation) are very important. On the other
13 hand, customer charges are much less important, since very few customers will
14 respond to the customer charge (only avoidable by discontinuing utility service).

15 **Q: Do the DOC Witnesses Peirce and Ouanes acknowledge the importance in**
16 **rate design of marginal costs and of rate elements to which customers can**
17 **respond?**

18 A: No. All of Ms. Peirce's conclusions about the customer charges are based on the
19 results of Xcel's embedded cost-of-service study, which deals only with the aver-
20 age costs of the existing system, not the marginal costs of increasing loads or
21 customer number. The Department also does not address whether increasing the
22 customer charge would give customers price signals to which they can respond.

23 Dr. Ouanes takes a more nuanced position on the role of embedded cost in
24 rate design, noting, "The CCOSS can then be used as one important factor in
25 determining how costs should be recovered from customer classes through rate

1 design” (Ouanes Direct, p. 18 ll. 19–20). He wisely does not identify the CCOSS
2 as providing a definitive accounting of the costs that should be included in any
3 rate-design component.

4 **Q: How should the costs to be collected through a residential customer charge**
5 **be determined?**

6 A: Residential rates usually include only two types of billing determinants: a fixed
7 monthly customer charge and variable energy charges (which may be differ-
8 entiated by season, block and, occasionally, time of day). Costs that tend to in-
9 crease with customer usage are properly reflected in the energy charges. That is
10 true for costs directly driven by customer usage, such as generation, transmis-
11 sion, substations, and distribution conductor sizing and number. Energy charges
12 should also include costs that tend to rise with customer usage level, whether
13 customer usage directly causes those costs. Examples of this category might
14 include bad debt, the costs associated with adding line transformers to avoid
15 long runs of secondary with high loads, or the additional distribution costs
16 between very large suburban homes, as opposed to close-packed urban duplexes
17 or apartments.

18 In contrast, the customer charge is intended to reflect the incremental costs
19 imposed by the continued presence of a customer who uses very little energy.
20 Thus, the customer charge should not be expected to cover the connection costs
21 of the average residential customer, but only the incremental cost of one more
22 very small customer. Since the smallest residential consumers will tend to be

1 located in multi-family buildings, the incremental customer costs are limited to a
2 meter, meter-reading, billing, customer accounts and customer service.¹⁰

3 As Dr. Ouanes explains:

4 Customer costs are those operating and capital costs found to vary
5 with the number of customers regardless of the customers' energy
6 consumption. They include the costs of metering, billing, tracking
7 accounts and responding to customer questions. (Ouanes Direct p. 19
8 ll. 17–20)

9 Note that Dr. Ouanes does not include the costs of the distribution system
10 in his list of customer costs, while Xcel does.

11 **Q: Does Ms. Peirce's testimony acknowledge that the smallest residential**
12 **customers, who pay little more than the customer charge, impose lower**
13 **costs than the average residential customer?**

14 A: No. She relies entirely on Xcel's estimate of average customer-classified costs,
15 and does not account for how connection costs vary between customers.

16 **Q: Are the smallest residential customers effectively "subsidizing" other high-**
17 **use residential customers by paying a customer charge higher that exceeds**
18 **the marginal cost of serving them?**

19 A: Based on the way that Ms. Peirce uses the term "subsidy," the small customers
20 are currently subsidizing the large customers. However, I do not believe this
21 consideration should be paramount for the Commission, as I discuss below.

22 **Q: How should the Commission approach the issue of subsidies in rate design?**

23 A: If one defines "subsidy" to mean "any cost that can be attributed in some manner
24 to a customer, yet is not borne by that customer," subsidies within any class will

¹⁰Even meter-reading costs may be lower for apartments, where numerous meters are generally grouped in a single meter room.

1 be inevitable. Equity is a multi-faceted concept; depending on one's concept of
2 fairness and entitlement, some customers can be thought of as being subsidized
3 by others in the following ways, among others:

- 4 • using energy at times when the cost of incremental generation energy is more
5 expensive than the average generation energy costs included in rates;¹¹
- 6 • paying less for generation energy than the cost of producing that energy in the
7 long term, including the need to add baseload plants and to meet forthcoming
8 limits on carbon dioxide and other pollutants;
- 9 • using more energy than the average customer at hours that drive the need for
10 distribution, transmission and/or generation upgrades;
- 11 • locating in an area with more-difficult soil conditions, increasing the cost of
12 setting poles and trenching underground systems;
- 13 • being a new customer and therefore being served by equipment that is newer,
14 more expensive, and less depreciated than average;
- 15 • locating where Xcel must add 100 feet of service line plus distribution facili-
16 ties up to 3.5 years of expected non-fuel charges, as opposed to a location with
17 existing distribution service and a short service run.

18 Thus, the Commission should not expect to avoid every aspect of rate de-
19 sign that might be considered to entail a subsidy.

20 **Q: What subsidies are most important to avoid?**

21 A: Subsidies that encourage customers to act in uneconomic ways create real costs.

22 Hence, it is important to give strong price signals regarding the cost of using

¹¹Whenever future generation energy resources are expected to be more expensive than the current mix of resources, customers who use less energy than average can be thought of as subsidizing the usage of above-average consumers.

1 energy. Pricing decisions that do not change behavior, such as the customer
2 charge, are much less important.

3 **Q: What is your position with regard to the Department’s recommendation**
4 **that Xcel increase its residential customer charge by \$0.50 per month?**

5 A: No increase in the residential customer charge is warranted based on my analy-
6 sis of customer costs and the Department’s own approach to setting customer
7 charges. As explained above, Xcel’s CCOSS customer-charge calculation in-
8 cludes charges that go well beyond those costs that, as Dr. Ouanes puts it, “vary
9 with the number of customers regardless of the customers’ energy consumption”
10 (Ouanes Direct, p. 19, defining customer charge). The costs that meet Dr.
11 Ouanes’s definition are lower than the current customer charge, so there is no
12 intra-class subsidy by the Department’s standard. More importantly, rates should
13 be designed to adhere to the principles laid out in statute, which include
14 encouraging conservation “to the maximum reasonable extent.” To achieve that
15 objective rate design should assign costs that do not vary with the number of
16 customers to the energy charge, which sends a price signal to customers to
17 conserve.

18 **Q: Does this conclude your rebuttal testimony?**

19 A: Yes.