

**STATE OF MINNESOTA  
BEFORE THE PUBLIC SERVICE 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**

**SURREBUTTAL TESTIMONY OF  
PAUL CHERNICK  
ON BEHALF OF  
SIERRA CLUB,  
MINNESOTA CENTER FOR ENVIRONMENTAL ADVOCACY,  
FRESH ENERGY,  
NATURAL RESOURCES DEFENSE COUNCIL, AND  
IZAAK WALTON LEAGUE MIDWEST OFFICE  
("CLEAN ENERGY INTERVENORS")**

Resource Insight, Inc.

**AUGUST 4, 2014**

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block rate?*  
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1 **I. INTRODUCTION**

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

4 A: Yes.

5 **Q: What is the purpose of this surrebuttal testimony?**

6 A: I respond to some issues raised in the rebuttal testimony on residential rate  
7 design by Ron Nelson on behalf of the Office of the Attorney General  
8 (“OAG”) and Steve Huso on behalf of Xcel.

9 **Q: Do you address all the residential rate design issues raised in rebuttal of**  
10 **other parties?**

11 A: No. I understand that Will Nissen of Fresh Energy will be addressing the  
12 comments of William Grant of the Department of Commerce, and Roger  
13 Colton, on behalf of Energy Cents, will be responding to assertions about  
14 affordability and the effects of inclining-block rates (“IBR”) on low-income  
15 customers.

16 **II. ATTORNEY GENERAL REBUTTAL**

17 **Q: To what portion of Mr. Nelson’s rebuttal will you be responding?**

18 A: I will respond to Mr. Nelson’s comparison between my IBR proposal and  
19 CenterPoint’s IBR from 2010/11.

20 **Q: What is Mr. Nelson’s point about the CenterPoint IBR?**

21 A: Mr. Nelson testifies about the “large number of consumer complaints that the  
22 OAG had received about the IBR program” implemented by CenterPoint

1 (Nelson rebuttal at 26). Those complaints appear to have been entirely  
2 focused on the cost of heating.<sup>1</sup>

3 Mr. Nelson does not identify any similar complaints regarding the  
4 Minnesota Power IBR plan, which has been in effect for several years.<sup>2</sup> To  
5 the contrary, Minnesota Power reports:

6 Data from Minnesota Power's customer call center indicate that  
7 the call center received 25 calls in 2011 (when the five-block rates  
8 were in place for only seven months), 44 calls in 2012, and 45 calls  
9 in 2013 dealing at least partially with the inverted block rate  
10 structure. Based on the relatively low number of calls, it does not  
11 appear that Minnesota Power's customers have been substantially  
12 confused by the change from three to five blocks for residential  
13 rates. (Annual Evaluation of Residential Five-Block Rate Design,  
14 at 6).

15 **Q: How relevant is the CenterPoint experience to your proposed IBR for**  
16 **Xcel?**

17 A: Not very. Because CenterPoint is a gas utility, the effects of the IBR, as  
18 reflected in the complaints received by the AG's Office, were related to  
19 increased costs on customers using gas for heating. A much smaller percent-  
20 age of electric customers heat with electricity. In any case, I have proposed  
21 initially excluding from the IBR the non-summer use of space heating cus-  
22 tomers, to avoid problems similar to those experienced with CenterPoint.  
23 Since space heating is a small part of total residential electric use, this is not a  
24 significant efficiency loss.

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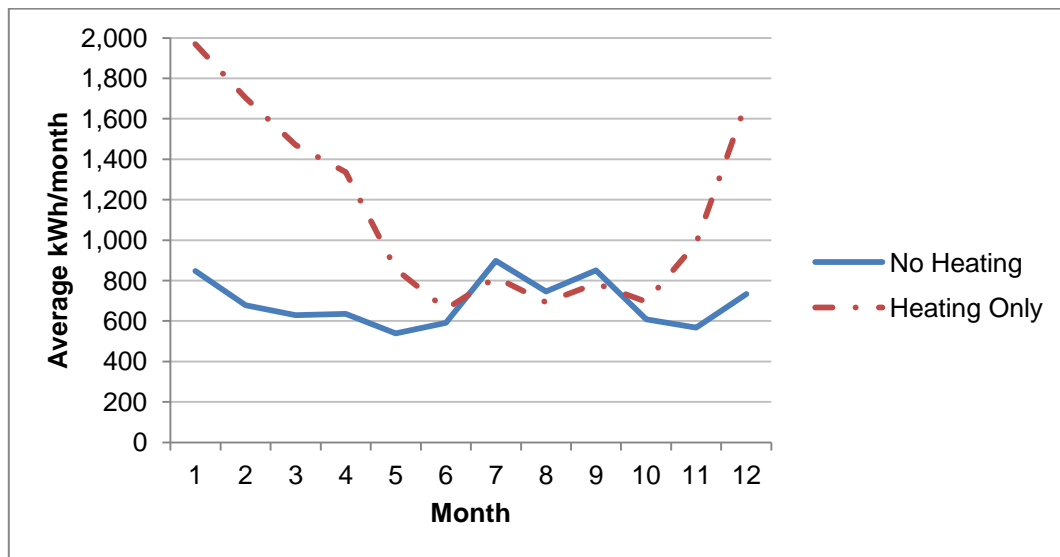
<sup>1</sup>Mr. Nelson does not specify the actual number of complaints, and attaches only 27 affidavits in his Schedule REN-4, two from the same customer. CenterPoint has more than 750,000 customers in Minnesota.

<sup>2</sup>Mr. Nelson acknowledges that Minnesota Power has used a five-block IBR since 2008, but he does not note that Minnesota Power had a three-block IBR since at least 1990, according to MP's Annual Evaluation of Residential Five-Block Rate Design.

1 **Q: Is the use of electricity for air conditioning comparable to the use of gas**  
2 **for heating, so that cooling load for electric customers might be subject**  
3 **to problems similar to those that arose for space heating in the**  
4 **CenterPoint case?**

5 A: No. Space heating uses much more energy per residential customer than does  
6 cooling. Space-heating customer usage rises much more in the winter than  
7 cooling use by either heating or non-heating customer; see Figure S-1.  
8 January heating use is three times the spring minimum, while July cooling  
9 load is only about 66% higher than the spring minimum.

10 **Figure S-1: Xcel Residential Average Use by Month**



11  
12 Source: MCEA IR 16, Attachment A

13 This figure demonstrates the potential problem for heating customers  
14 and the lack of a similar problem for non-heating customers. A typical heating  
15 customer's bills would be in Block 2 in some summer months, in Block 3 in  
16 the other summer months and a couple shoulder months, but would leap high  
17 into Block 4 in six winter months, far above the winter breakeven consump-  
18 tion level of 825 kWh/month. In January, that typical heating customer would

1 be paying 11% more with the proposed IBR than with a flat rate, had I not  
2 proposed exempting heating loads.<sup>3</sup>

3 In contrast, an average non-heating customer would be in Block 2 for a  
4 couple of shoulder months, with some usage in Block 3 in most months, but  
5 would be well below the breakeven consumption levels of 1,050 kWh/month  
6 in the summer and 825 kWh/month in the winter, except for January, when  
7 the average customer's usage would be slightly higher than the breakeven  
8 level, resulting in a January bill 0.3% higher with the IBR than without. The  
9 annual bill for this customer would be about 4% less with the IBR.

10 **Q: Do you have any response to Mr. Nelson's testimony about the differences**  
11 **between your proposal and the IBR of Xcel's Colorado affiliate?**

12 A: Yes. Mr. Nelson points out the following three differences:

- 13 • the Xcel Colorado IBR applies only in the summer,  
14 • the Xcel Colorado IBR has only two blocks,  
15 • the Colorado Public Utilities Commission ("PUC") had several  
16 proposals for alternative IBR designs.

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<sup>3</sup> The importance of heating load is much greater for a gas utility, such as CenterPoint, than cooling load is for an electric utility such as Xcel. Based on the difference between winter and shoulder-month sales, Minnesota residential gas load appears to be about 75% heating (three times base load), while only about 14% (one fifth of the base load) of Xcel's residential usage is extra summer load, which would be mostly cooling. All else equal, seasonal usage swings would have only about one fifteenth the rate effects for Xcel cooling as for CenterPoint heating load.

1 **Q: What is the significance of the Colorado IBR applying only in the**  
2 **summer, while your proposal would apply all year round for non-heating**  
3 **customers?**

4 A: Mr. Nelson does not explain why he thinks applying the IBR to non-heating  
5 customers outside of the summer months would be a problem. The broader  
6 IBR should encourage greater conservation, additional installation of energy-  
7 efficiency appliances, and result in greater reductions in emissions of CO<sub>2</sub>,  
8 compared to a summer-only IBR. While my proposal is different from the  
9 Colorado IBR in this regard, it is clearly superior.

10 **Q: What is the significance of the Colorado IBR having two blocks?**

11 A: Again, Mr. Nelson does not explain why he thinks this is important, other  
12 than the fact that the Colorado PUC opined that a two-block design might be  
13 less confusing than an IBR with more blocks. This is not a compelling argu-  
14 ment, since Minnesota Power customers do not appear to be confused by a  
15 five-block design. My direct testimony identified 55 utilities in 29 states and  
16 provinces that utilize inclining-block rate structures. Customers appear to  
17 understand the concept that electricity will get more expensive as they use  
18 more.

19 Mr. Nelson also states, “the current proposal is much more complicated  
20 than the IBR that was ordered in Colorado.” However, the proposal is less  
21 complicated than the Minnesota Power IBR and much less complicated than  
22 some of the IBRs used by other some other utilities, which use variable block  
23 sizes by region, heating fuel, and weather.

24 In any case, while Mr. Nelson asserts that I proposed five tiers, my  
25 proposal actually has only four tiers.

1 **Q: What is the significance of the Colorado PUC having been presented**  
2 **with multiple proposals?**

3 A: Mr. Nelson suggests his concern that “the Minnesota PUC may not have the  
4 benefit of alternatives” (Nelson Direct at 36). Interestingly, even though Mr.  
5 Nelson professes to be very concerned about the lack of alternative IBR  
6 structures in this proceeding, he does not propose any alternatives or even  
7 identify specific alternatives he believes the Commission should consider.  
8 The OAG has not requested that either Xcel or I compute IBR rate designs  
9 with different numbers of blocks, or different breakpoints, or different ratios  
10 of block prices. Actually, Mr. Nelson could have performed those  
11 computations himself, since I provided the spreadsheet that I used to design  
12 the IBR. (DER-MCEA IR 324).

13 It appears that Mr. Nelson is unable to identify any features of the IBR  
14 proposal that he would change, and is unwilling to explore the alternative  
15 designs that he claims are so important.

16 **Q: What weight should the Commission give to Mr. Nelson’s comments on**  
17 **your IBR proposal?**

18 A: With regard to the issues I discuss above, Mr. Nelson’s comments are  
19 essentially irrelevant to the Commission’s decision and should be given little  
20 weight. I considered a wide range of alternative designs before settling upon  
21 the IBR I proposed, and would have been happy to consider any design  
22 changes that the OAG proposed. Mr. Nelson, however, did not suggest any  
23 changes in discovery or his rebuttal. Mr. Nelson’s testimony amounts to little  
24 more than diffuse opposition to inverted block rates. The bulk of his concerns  
25 are belied by the fact that Minnesota Power and many other utilities have



1 successfully implemented an IBR plan. The Commission should not give Mr.  
2 Nelson’s complaints any substantial weight.

3 One point on which I do agree with Mr. Nelson is the importance of  
4 effective customer communications regarding the IBR.

5 **III. XCEL REBUTTAL**

6 **Q: What are Mr. Huso’s concerns regarding your IBR proposal?**

7 A: Mr. Huso (Rebuttal at 11) asserts that my IBR proposal does not meet the  
8 requirements “of conservation and affordability...in a way that is fair, reason-  
9 able and effective.” At 11–12, he describes my proposed IBR as having the  
10 following three flaws:

- 11 • “Ineffective as a conservation policy.”
- 12 • “Substantial negative customer impacts.”
- 13 • “Administratively burdensome.”

14 **Q: What is Mr. Huso’s basis for questioning the effectiveness of price signals**  
15 **in rate design?**

16 A: Oddly, Mr. Huso (at 12) starts his critique of conservation-oriented rate  
17 design by agreeing that “rate components encourage conservation by sending  
18 accurate pricing signals and encouraging the efficient use of resources. He  
19 specifically suggests that time-of-use and critical-peak pricing “allow cus-  
20 tomers to make informed decisions regarding energy usage.”

21 Mr. Huso (at 13) suggests that rate design is unimportant because  
22 “customers respond more strongly to the total amount of their electric bills  
23 than to specific energy rates” and claims that his Exhibit SVH-2, Schedule 1,  
24 “cites three definitive studies that support the overriding influence of bill  
25 amounts over energy rate levels.”

1 **Q: Does Exhibit SVH-2, Schedule 1, “cite three definitive studies that sup-**  
2 **port the overriding influence of bill amounts over energy rate levels”?**

3 A: No. Of the three documents, Attachment C is a general discussion paper by  
4 Steven L. Puller and Jeremy West of Texas A&M regarding issues related to  
5 rate design in Texas’s peculiar form of restructuring. While this paper covers  
6 a variety of topics, it does not provide the evidence that Mr. Huso claims.<sup>4</sup> In  
7 fact, Puller and West conclude that marginal rates can change customer  
8 behavior, if the rate is explained well:

9 [O]bserved behavior is consistent with consumers responding to  
10 either the *marginal* price...or to the *average* price.... Either  
11 behavioral response is possible depending on consumer knowledge  
12 of the tariff function and the type of information that is saliently  
13 reported on customer bills. Utility bills often do a poor job of  
14 clearly displaying the marginal price of an additional kWh of  
15 power.... Casual empiricism suggests that utility customers are  
16 better informed about the total monthly expenditures on  
17 gas/electricity rather than the marginal price; contrast this with  
18 retail gasoline customers who are likely better informed about the  
19 (marginal) price per gallon than about their total monthly  
20 expenditures on gasoline. (Exhibit SVH-2, Schedule 1, Attachment  
21 C at 6).

22 and

23 [I]f normative prescriptions from academic research focus on  
24 ‘getting the marginal price right,’ then they should also advocate  
25 for bill design that saliently displays this price signal. (Ibid. at 7).

26 Puller and West assume that “tiered pricing schemes are inconsistent  
27 with marginal cost pricing (either social or private), and often are motivated  
28 by distributional or conservation goals.” (ibid. at 13). This is apparently  
29 because the authors assume (incorrectly) that all customers can be charged

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<sup>4</sup>Attachment C does cite a draft of Attachment A, which I will discuss below.

1 marginal costs under cost-of-service regulation and that load shape and hence  
2 costs do not vary with consumption levels.<sup>5</sup> As opposed to regulated rates,  
3 they suppose:

4 [T]ariffs formed instead via market forces could be linear tariffs  
5 for all usage charges and show no differential marginal prices.  
6 However, evidence from the first years of the Texas retail market  
7 suggests that increasing block tariffs continue under retail choice.  
8 (Ibid.)

9 Indeed, the largest competitive “retailer entered the market with single  
10 block tariffs for the first year but then switched to an increasing block tariff.”  
11 (Exhibit SVH-2, Schedule 1, Attachment C, at 14).

12 In other words, Puller and West observe that competitive suppliers find  
13 IBRs to be advantageous, but do not understand why that is the case. They  
14 also agree that customer behavior is consistent with their responding to  
15 marginal prices, and emphasize the importance of clear communication of  
16 rate design to customers.

17 **Q: Since Attachment C is not what Mr. Huso claims, is he at least correct**  
18 **that Exhibit SVH-2, Schedule 1, cites *two* definitive studies that support**  
19 **the overriding influence of bill amounts over energy rate levels?**

20 A: No, for several reasons. First, Attachment A (Ito) and Attachment B (Boren-  
21 stein) are two reports of analyses from overlapping data. Ito used monthly

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<sup>5</sup>Puller and West also state (at 10) that “marginal price diverges from marginal cost [because] fixed distribution costs are priced into the variable/usage component of tariffs rather than solely into the fixed customer charge.” This statement appears to assume that usage levels do not affect demand-related costs that are fixed in the short run, such as the number and sizing of transmission lines, substations, feeders and transformers; the useful life of equipment; and, for Xcel, the costs of generation plants. This lack of understanding of cost causation limits the value of their insights, even for the Texas market and even more so for vertically integrated utilities.

1 data for a very small portion (six communities) of the Southern California  
2 Edison (“SCE”) and San Diego Gas & Electric service territories in Orange  
3 County from 1999 through 2007, and his advisor Borenstein used data for  
4 SCE just for March, April, and May of 2000, 2002, 2004 and 2006.

5 Second, to the extent that these studies rely on econometric analysis of  
6 elasticities, they could not possibly be “definitive,” as Mr. Huso claims. At  
7 page 13 of my direct testimony, I quote the results from three reviews of  
8 residential electric price elasticity analyses, which reported estimates of short-  
9 run price elasticity ranging from  $-0.004$  to  $-2.01$  and long-run price elasti-  
10 cities from  $-0.04$  to  $-2.25$ . Clearly, any one analysis, or two closely related  
11 analyses, can produce anomalous results. Even with the multiple studies from  
12 different periods and datasets, it would be presumptuous to claim a definitive  
13 value for total residential price elasticity. Given the thin literature on  
14 marginal price elasticity, Mr. Huso’s claim that the Ito and Borenstein papers  
15 are definitive is preposterous.

16 Third, one of Ito and Borenstein’s major findings is that customers do  
17 not calibrate their monthly usage to fall just above or below the block break-  
18 points. The authors assume that customers, were they responding to the IBR,  
19 would not just attempt to conserve and stay in the lower block, but would  
20 carefully control their monthly usage to aim for a point slightly below a  
21 breakpoint. They do not explain how customers would have accomplished  
22 this feat on a monthly basis, in the face of weather and other usage drivers  
23 varying between and within months, in the absence of real-time consumption  
24 data that were simply unavailable in 2000–2006.<sup>6</sup>

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<sup>6</sup>I do not know whether Messrs. Ito, Borenstein, or Huso has ever tried to explain the variation in their electricity consumption from month to month within a season, or from one year to the

1           Hence, this supposed proof that customers do not respond to IBRs is  
2 simply a demonstration that customers cannot fine-tune their monthly con-  
3 sumption to keep usage just below a block breakpoint. Instead, IBR en-  
4 courages the vast majority of customers to reduce their consumption, to mini-  
5 mize the energy they use in their highest-priced block (regardless of whether  
6 they can eliminate all use in that block) and the probability of exceeding the  
7 next breakpoint and paying a higher marginal rate.

8           Fourth, the results in Borenstein’s paper demonstrate how unreliable  
9 econometric analyses can be. For example, at the top of page 32 of Exhibit  
10 SVH-2, Schedule 1, Attachment B, Borenstein reports positive coefficients  
11 for many of the price variables, including the average-price variable, suggest-  
12 ing that higher prices result in higher consumption. Some of those implaus-  
13 ible coefficients are statistically significant, even though they are certainly  
14 wrong. The elasticities in that table also vary widely among the time periods,  
15 with the average-price coefficient varying from +0.05 in 2000–2002, to –0.45  
16 in 2002–2004, to –0.12 in 2004–2006.

17           Fifth, the period used in the analysis includes the California electricity  
18 crisis and its aftermath, including the wholesale price run-up in 2000, brown-  
19 outs and black-outs in 2000 and 2001, the 2001 bankruptcy of PG&E, and a  
20 price jump in 2001 when market prices were allowed to flow through to  
21 consumers.<sup>7</sup> The period of supply problems (in which reducing load was a

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next for the same month, but I have tried several times with my own bill, to little avail. It is not clear how they believe a customer who thought he was using more than his target energy on April 20<sup>th</sup>, for example, could respond in the rest of April to return to the target usage: put off laundry to May? Or perhaps unplug standby loads until the end of the month, and then plug them in again to aim for the May target?

<sup>7</sup>See page 12 of Schedule 1. Another price jump occurred in 2006.

1 powerful social imperative) only partially overlapped the period of higher  
2 prices. Resentment of Enron and the other brokers who manipulated market  
3 prices, and of the high-priced contracts to which the state committed rate-  
4 payers, may also have affected consumption over time. Hence, it is hardly  
5 surprising that sorting out the marginal and average price effects from other  
6 factors would be difficult in this turbulent period.<sup>8</sup>

7 Sixth, Borenstein acknowledges that the customers in his 2000–2006  
8 database did not have good information about the block prices they faced.

9 Until a redesign of utility bills in 2008, SCE residential bills did  
10 not give a customer information about the marginal price of  
11 consumption above the tiers on which he is consuming. Even  
12 calculating it from their website required merging of data from  
13 different web pages. (Attachment B at 9).

14 To the extent that Ito and Borenstein demonstrate anything, it may be  
15 the same as the main point in Puller and West, which is the same as one of  
16 Mr. Nelson’s most cogent remarks: customers need clear and effective com-  
17 munication about prices for IBR to be effective.

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<sup>8</sup>Borenstein acknowledges this problem in the context of his explanation for his unusual choice of data:

Unfortunately for this analysis, many other events had occurred that could confound the time-series comparison. California’s electricity crisis from June 2000 to May 2001 brought public conservation campaigns, threats of blackouts, and explicit conservation rebates during the ensuing summers for households that reduced consumption by at least 20% compared to summer 2000. The rebates were distributed through a lump sum bill credit at the end of the summer, further muddying the analysis. (Attachment B at 22).

1 **Q: Do you have anything to add to the discussion of marginal price elasticity**  
2 **in your direct testimony?**

3 A: Yes. Since I filed that testimony, I have obtained a copy of the recent study  
4 attached as Exhibit\_\_\_\_PLC-S-1. That analysis indicates that introduction of  
5 block rates in British Columbia did not increase usage by customers with  
6 consumption entirely in the lower block and decreased usage by customers  
7 with consumption in the higher block. Even within the higher block (over  
8 675 kWh/month, roughly my proposed third block), larger customers (over  
9 1,200 kWh/month, or in my proposed fourth block) showed higher elasticity.

10 I also found the 1984 article by Henson, attached as Exhibit\_\_\_\_PLC-S-  
11 2, which finds that marginal price is an important driver of residential con-  
12 sumption.<sup>9</sup> Henson (155) concludes as follows:

13 [T]he elasticity of residential electricity demand with respect to  
14 marginal price are in the range  $-.27$  to  $-.30$ . Changes...in infra-  
15 marginal prices are not found to have significant effects on  
16 consumption.

17 **Q: Are there any other reasons that the Ito and Borenstein papers should be**  
18 **given little weight?**

19 A: Yes. Extraordinary claims require extraordinary evidence.<sup>10</sup> The claim that  
20 customers do not respond to rate design is so counter-intuitive, so incon-  
21 sistent with experience, and so contrary to a century of rate design that it  
22 requires the very highest evidentiary proof. Even routine scientific findings  
23 require replication to be accepted; surprising results require multiple  
24 confirmations.

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<sup>9</sup>Henson, Steven. 1984. "Electricity Demand Estimates under Increasing-Block Rates"  
*Southern Economic Journal* 51:1 (Jul., 1984), pp. 147–15.

<sup>10</sup>This standard is sometimes credited to Carl Sagan.

1           If customers only pay attention to their total bill or average rate, they  
2 would not alter their consumption regardless of whether Xcel's rate design  
3 were changed to \$1/month plus 15¢/kWh or \$100/month plus 1¢/kWh. That  
4 outcome is implausible.

5 **Q: Does Mr. Huso attach any other documents to his Exhibit SVH-2,**  
6 **Schedule 1?**

7 A: Yes. Pages 86 to 145 of Schedule 1, which is apparently the Attachment D  
8 cited at page 3 of Schedule 1, is the CenterPoint customer survey I discussed  
9 at page 14 of my direct testimony. Mr. Huso quotes CenterPoint's conclusion  
10 that most customers say that "the total amount of the bill is more important  
11 than the individual components" (Schedule 1 at 3), but fails to respond to my  
12 observation that a large percentage of the customers also report paying  
13 attention to the various parts of the bill. The CenterPoint survey supports the  
14 idea that customers respond to both total bills (which must be limited to the  
15 revenue requirement) and the block structure, suggesting that IBR would be  
16 effective in Minnesota.

17 **Q: Does this conclude your surrebuttal testimony?**

18 A: Yes.