



# Minnesota Center for Environmental Advocacy

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Using law, science, and research to protect Minnesota's environment, its natural resources, and the health of its people.

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June 14, 2016

The Honorable Jeffrey Oxley  
Administrative Law Judge  
600 North Robert Street  
P.O. Box 64620  
St. Paul, MN 55164-0620

**VIA ELECTRONIC SERVICE**

*Re: In the Matter of the Application of Northern States Power Company for  
Authority to Increase Rates for Electric Service in the State of Minnesota  
PUC Docket No.: E-002/GR-15-826*

Dear Judge Oxley,

In connection to the above-captioned docket, enclosed please find the Direct  
Testimony and Schedules of Jonathan F. Wallach, filed on behalf of Clean Energy  
Organizations. Also attached is an affidavit of service.

Sincerely,

/s/ Hudson B. Kingston  
Hudson B. Kingston  
Staff Attorney

HBK/em

Enclosure

cc: Service List

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

**In the Matter of the Application of                    )**  
**Northern States Power Company for            )**           **PUC Docket No. E002/GR-15-826**  
**Authority to Increase Rates for                )**  
**Electric Service in Minnesota                )**

**DIRECT TESTIMONY OF**

**JONATHAN WALLACH**

**ON BEHALF OF**

**NATURAL RESOURCES DEFENSE COUNCIL**

**MINNESOTA CENTER FOR ENVIRONMENTAL ADVOCACY**

**FRESH ENERGY**

**WIND ON THE WIRES**

**SIERRA CLUB**

Resource Insight, Inc.

**JUNE 14, 2016**

## TABLE OF CONTENTS

I.	Introduction .....	1
II.	NSPM Proposal .....	4
III.	Intra-Class Cost Subsidization .....	6
IV.	Economically Efficient Price Signals .....	14
V.	Conclusions and Recommendations .....	19

## TABLE OF SCHEDULES

Schedule 1	Professional Qualifications of Jonathan F. Wallach
Schedule 2	Company’s response to CEO Information Request No. 10
Schedule 3	Company’s response to CEO Information Request No. 9
Schedule 4	Frederick Weston, Charging for Distribution Utility Services: Issues in Rate Design, Regulatory Assistance Project (Dec 2000)
Schedule 5	Company’s response to CEO Information Request No. 1
Schedule 6	Jim Lazar & Wilson Gonzalez, Smart Rate Design for a Smart Future, Regulatory Assistance Project (July 2015)
Schedule 7	Espy, James and Molly Espy. 2004. “Turning on the Lights: A Meta-Analysis of Residential Electricity Demand Elasticities”
Schedule 8	Studies of Marginal-Price Elasticity

1 **I. INTRODUCTION**

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

3 **A:** My name is Jonathan F. Wallach. I am Vice President of Resource Insight, Inc., 5 Water  
4 Street, Arlington, Massachusetts.

5 **Q: Please summarize your professional experience.**

6 **A:** I have worked as a consultant to the electric power industry since 1981. From 1981 to  
7 1986, I was a research associate at Energy Systems Research Group. In 1987 and 1988, I  
8 was an independent consultant. From 1989 to 1990, I was a senior analyst at Komanoff  
9 Energy Associates. I have been in my current position at Resource Insight since  
10 September of 1990.

11 Over the past thirty years, I have advised and testified on behalf of clients on a wide  
12 range of economic, planning, and policy issues relating to the regulation of electric  
13 utilities, including: electric-utility restructuring; wholesale-power market design and  
14 operations; transmission pricing and policy; market-price forecasting; market valuation of  
15 generating assets and purchase contracts; power-procurement strategies; risk assessment  
16 and mitigation; integrated resource planning; mergers and acquisitions; cost allocation  
17 and rate design; and energy-efficiency program design and planning.

18 My resume is attached to this testimony as Schedule 1.

1 **Q: Have you testified previously in utility regulatory proceedings?**

2 **A:** Yes. I have sponsored expert testimony in more than seventy state, provincial, or federal  
3 proceedings in the U.S. and Canada. Schedule 1 to this testimony includes a detailed list  
4 of my previous testimony.

5 **Q: On whose behalf are you testifying?**

6 **A:** I am testifying on behalf of the Natural Resources Defense Council, Minnesota Center for  
7 Environmental Advocacy, Fresh Energy, Wind on the Wires, and the Sierra Club  
8 (collectively “Clean Energy Organizations” or “CEO”).

9 **Q: What is the purpose of your testimony?**

10 **A:** On November 2, 2015, Northern States Power Company of Minnesota (“NSPM” or “the  
11 Company”) filed an application for authority to increase electric rates, including  
12 supporting testimony by Steven V. Huso regarding the Company’s proposal to increase  
13 the monthly customer charge for residential customers by \$2. My testimony responds to  
14 Mr. Huso’s with respect to the residential customer charge.<sup>1</sup>

15 **Q: Please summarize your findings and conclusions regarding the Company’s proposal  
16 to increase the residential customer charge.**

17 **A:** As the Commission found in Docket No. E-002/GR-13-868, Minnesota law requires that  
18 electric rates encourage energy conservation and be affordable:

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<sup>1</sup> The Company also proposes to increase customer charges for small commercial customers by \$2 per month. While I do not directly address this aspect of the proposal, my findings and conclusions with regard to the residential customer charge would generally apply to the Company’s proposal regarding the small commercial customer charge as well.

1           In setting rates, the Commission must consider both ability to pay and the  
2           need to encourage energy conservation. The Commission must balance these  
3           factors against the requirement that the rates set not be “unreasonably  
4           preferential, unreasonably prejudicial, or discriminatory” and the utility’s need  
5           for revenue sufficient to enable it to provide service.<sup>2</sup>

6           The Company’s proposal to increase the residential customer charge runs contrary to  
7           those statutory requirements. As explained in more detail below, the proposed increase  
8           would:

- 9           • Inappropriately shift recovery of load-related costs to the customer charge.
- 10          • Exacerbate the subsidization of high-use residential customers’ costs by low-usage  
11          customers, and thereby inequitably increase bills for the Company’s smallest  
12          residential customers.
- 13          • Dampen price signals to consumers for reducing energy usage.

14          In Docket No. E-002/GR-13-868, the Commission found that even a half-dollar increase  
15          in the customer charge would unreasonably dampen price signals and disproportionately  
16          burden low-usage customers:

17                 The Commission concludes that raising the Residential and Small General  
18                 Service customer charges, even by the smaller amount the Department  
19                 recommends, would give too much weight to the fixed customer cost  
20                 calculated in Xcel’s class-cost-of-service study and not enough weight to  
21                 affordability and energy conservation.<sup>3</sup>

22          The Commission further concluded in that docket that an increase of any magnitude was  
23          unwarranted, particularly given its approval of a revenue decoupling mechanism:

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<sup>2</sup> *Finding of Facts, Conclusions, and Order*, Docket No. E-002/GR-13-868, May 8, 2015, 88  
(citing Minn. Stat. §§ 216B.16, subd. 15, 216B.03, 216B.16, subd. 6).

<sup>3</sup> *Id.*

1 The Commission also concludes that a customer-charge increase for these  
2 classes would place too little emphasis on the need to set rates to encourage  
3 conservation. This is particularly true where the Commission has approved a  
4 revenue decoupling mechanism that will largely eliminate the relationship  
5 between Xcel's sales and the revenues it earns. As several parties have argued,  
6 decoupling removes the need to increase customer charges to ensure revenue  
7 stability.<sup>4</sup>

8 In the current proceeding, NSPM proposes to increase the residential customer charge by  
9 an even greater amount than what was found to be unreasonable and unwarranted in  
10 Docket No. E-002/GR-13-868. For the reasons laid out below, the Commission should  
11 again reject the Company's proposal to increase the monthly customer charge for  
12 residential customers.

## 13 **II. NSPM PROPOSAL**

14 **Q: What is the Company's proposal with respect to the customer charge for residential**  
15 **customers?**

16 **A:** The Company proposes to increase the monthly customer charge for residential  
17 customers by \$2.<sup>5</sup> The Company's proposal represents about a 23% increase over the  
18 current weighted-average rate of \$8.72 per month.<sup>6</sup>

19 Company witness Huso contends that the Company's proposal would result in a  
20 residential customer charge that better reflects the fixed customer-related cost to serve the

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<sup>4</sup> *Id.*

<sup>5</sup> Steven V. Huso, *Direct Testimony and Schedules*, Exhibit SVH-1, Docket No. E-002/GR-15-826, 14 (Nov. 2, 2015) [hereinafter "Huso Direct"].

<sup>6</sup> This is the weighted average across standard underground, standard overhead, electric heat underground, and electric heat overhead service types. See the Company's response to CEO Information Request No. 10(a), attached to this testimony as Schedule 2, for the derivation of the weighted-average monthly rate of \$8.72.

1 residential class, as indicated by the results of the class cost of service study for the 2016  
2 test year (“2016 CCOSS”). Specifically, Mr. Huso notes that the proposed customer  
3 charge of \$10.72 would recover about 57% of the embedded costs classified as customer-  
4 related and allocated to the residential class in the 2016 CCOSS.<sup>7</sup> The 2016 CCOSS  
5 estimate of customer-related costs includes a portion of distribution plant costs classified  
6 as customer-related along with the costs of meters, meter reading, billing, collections,  
7 other customer services, and associated overheads.

8 **Q: Why does NSPM want to move the residential customer charge closer to the 2016**  
9 **CCOSS estimate of embedded customer-related costs?**

10 **A:** Mr. Huso offers two justifications for this proposal. First, Mr. Huso asserts that increasing  
11 the customer charge would mitigate purported subsidization of low-usage customers’  
12 customer-related costs by larger residential customers.<sup>8</sup> Second, Mr. Huso claims that  
13 increasing the residential customer charge to better reflect embedded customer-related  
14 costs would improve price signals for promoting economically efficient behavior by  
15 residential customers.<sup>9</sup>

16 I address each of these justifications in the following two sections.

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<sup>7</sup> Huso Direct, Exhibit SVH-1 at 16. The term “embedded costs” refers to the accounting costs on the Company’s books in the test year, as reflected in the 2016 CCOSS for the 2016 test year.

<sup>8</sup> To the extent that customer-related costs are recovered through energy rates, a low-usage customer will contribute a smaller share toward recovery of such costs than a larger residential customer. Conversely, to the extent that demand-related costs are recovered through the customer charge, a low-usage customer will contribute a larger share toward recovery of such costs than a larger residential customer.

<sup>9</sup> Huso Direct, Exhibit SVH-1 at 14.



1 **III. INTRA-CLASS COST SUBSIDIZATION**

2 **Q: What is the basis for Mr. Huso's assertion that increasing the customer charge**  
3 **would mitigate subsidization of low-usage customers' customer-related costs by**  
4 **larger residential customers?**

5 **A:** Mr. Huso relies on the results of the 2016 CCOSS to support this claim. Specifically, in  
6 his direct testimony, Mr. Huso notes that the 2016 CCOSS estimates an embedded  
7 customer-related cost of \$18.65 per customer per month for residential customers.<sup>10</sup> And  
8 Mr. Huso asserts that any amount of that customer-related cost recovered through the  
9 energy charge represents a subsidy payment from above-average to below-average  
10 customers.<sup>11</sup> Thus, the Company's proposal to increase the residential customer charge  
11 from \$8.72 to \$10.72 would reduce the amount of customer-related costs recovered  
12 through the energy charge and thereby reduce the alleged subsidy payment from above-  
13 average to below-average customers.

14 **Q: Do you agree with Mr. Huso's claim that increasing the customer charge would**  
15 **reduce subsidization of low-usage customers by larger residential customers?**

16 **A:** No. To the contrary, I conclude from a review of the 2016 CCOSS that above-average  
17 customers are currently being subsidized by low-usage customers. Thus, the Company's  
18 proposal would actually *exacerbate* intra-class subsidization by shifting costs  
19 inappropriately from high-use to low-use customers, and thereby would diminish rate  
20 affordability for smaller customers.

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<sup>10</sup> *Id.* at 16.

<sup>11</sup> Company's response to CEO Information Request No. 9(b), attached to this testimony as Schedule 3.

1 Specifically, I find that the 2016 CCOSS overstates the embedded cost to serve a  
2 residential customer because it classifies distribution plant costs as either demand-related  
3 or customer-related on the basis of the results of Minimum System and Zero Intercept  
4 analyses. As discussed below, such analyses typically produce classifications that are  
5 inconsistent with cost-causation and tend to overstate the minimum cost per customer for  
6 distribution plant. Using a more-reasonable approach for classifying distribution plant  
7 costs, I find that the embedded cost to serve a residential customer is less than the amount  
8 currently being recovered through the residential customer charge, which indicates that  
9 low-usage customers are currently subsidizing high-usage customers.

10 **Q: How do the Minimum System and Zero Intercept methods differ?**

11 **A:** Minimum System analyses attempt to estimate the cost to install the same number of  
12 units (e.g., poles, conductor-feet) as are currently on the distribution system, assuming  
13 that each of those units are the smallest size currently used on the system. The Minimum  
14 System approach attempts to estimate the cost to exactly replicate the configuration of the  
15 existing distribution system using the smallest-size equipment currently used on the  
16 system.

17 As with the Minimum System approach, the Zero Intercept method attempts to estimate  
18 the cost to replicate the configuration of the existing distribution system, assuming the  
19 same number of poles, conductor-feet, transformers, and services. However, where the  
20 Minimum System approach estimates minimum cost based on equipment cost for the  
21 smallest-size equipment actually in use, the Zero Intercept method derives minimum cost  
22 based on an estimate of what the equipment would cost in theory if it did not have to  
23 carry any load. The Zero Intercept approach derives the cost of this hypothetical zero-

1 load equipment by estimating a functional relationship between equipment cost and  
2 equipment size based on the current system, and then extrapolating that cost function to  
3 estimate the cost of equipment that carries zero load (e.g., zero-kVA transformers), the  
4 smallest units legally allowed (e.g., 25-foot poles), or the smallest units physically  
5 feasible (e.g., the thinnest conductors that will support their own weight in overhead  
6 spans).

7 Under either approach, the estimated minimum cost of existing distribution plant is  
8 deemed to be customer-related, and the remainder of distribution plant cost in excess of  
9 minimum cost is classified as demand-related.

10 **Q: Do Minimum System or Zero Intercept analyses generally produce reasonable**  
11 **classifications of distribution plant costs?**

12 **A:** No. Both approaches are conceptually flawed since they are premised on a simplistic  
13 model of cost-causation that is inconsistent with typical distribution-system planning,  
14 design, and investment practices.

15 In practice, distribution-system costs may be driven by a host of planning and design  
16 considerations – such as customer load, load growth, terrain, number of customers,  
17 customer density, voltage considerations, or minimum service reliability and quality  
18 requirements. Minimum System and Zero Intercept analyses disregard this multitude of  
19 cost drivers and instead simplistically model cost-causation as a function of just *two*  
20 *factors*: customer load and number of customers. With only two categories for classifying  
21 costs (i.e., as either demand-related or customer-related), minimum distribution system

1 analyses tend to classify as customer-related all costs not directly driven by demand, even  
2 though such costs may be driven by factors other than number of customers.

3 In other words, as James Bonbright, Albert Danielson, and David Kamerschen explain in  
4 their *Principles of Public Utility Rates*, minimum system analyses will inappropriately  
5 dump into the customer-cost category those plant costs that are neither driven by demand  
6 nor by number of customers:

7 But if the hypothetical cost of a minimum-sized distribution system is  
8 properly excluded from the demand-related costs ..., while it is also denied a  
9 place among the customer costs ..., to which cost function does it then  
10 belong? The only defensible answer, in our opinion, is that it belongs to none  
11 of them. Instead, it should be recognized as a strictly unallocable portion of  
12 total costs.... But fully-distributed cost analysts dare not avail themselves of  
13 this solution, since they are prisoners of their own assumption that “the sum of  
14 the parts is equal to the whole.” They are therefore under impelling pressure to  
15 fudge their cost apportionments by using the category of customer costs as a  
16 dumping ground for costs that they cannot plausibly impute to any of their  
17 other cost categories.<sup>12</sup>

18 **Q: Are there other problems with these two approaches for estimating minimum  
19 distribution plant cost?**

20 **A:** Yes. Both the Minimum System and Zero Intercept methods suffer from specific  
21 problems that tend to misclassify demand-related costs as customer-related.

22 The problem with the Minimum System method arises due to the fact that even the  
23 minimum-size equipment currently installed on the system has some amount of load-  
24 carrying capability. Consequently, some portion of the cost for this minimum-size

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<sup>12</sup> James C. Bonbright, Albert L. Danielsen, & David R. Kamerschen, *Principles of Public Utility Rates*, Arlington, VA: Public Utilities Reports, 492 (1988).

1 equipment should be classified as demand-related. However, under the Minimum System  
2 method, that portion of minimum-equipment cost appropriately classified as demand-  
3 related is instead misclassified as customer-related.<sup>13</sup>

4 The Zero Intercept method avoids this misclassification of demand-related costs by  
5 setting minimum cost at the estimated cost for a hypothetical system with zero load.<sup>14</sup>

6 However, at a conceptual level, the Zero Intercept method is so abstract that its  
7 application may not yield realistic results. Specifically, it may not be appropriate to  
8 extrapolate from the current system to estimate the cost of a system that serves zero load.

9 A system designed to connect customers but serve zero load would likely look very  
10 different from the existing system. For example, a zero-capacity electric system would  
11 not use the overlapping primary and secondary systems and line transformers that the  
12 actual system uses. Without the need for high voltages to carry power, or the need for line  
13 transformers to step down high voltages, poles could be shorter and thinner. The labor  
14 and equipment costs of setting those short, light poles would be much lower than the  
15 costs of real utility poles of any size. It is therefore likely that a cost estimate based on an  
16 extrapolation from the current system would overstate the cost of a zero-load system and  
17 thus overstate the portion of distribution costs classified as customer-related. If so, then  
18 the Zero Intercept approach would misclassify demand-related costs as customer-related.

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<sup>13</sup> The 2016 CCOSS adjusts the allocator for demand-related costs to reflect this residual load-carrying capability of minimum-size equipment. However, the 2016 CCOSS does not reduce the portion of distribution plant costs classified as customer-related to reflect the fact that some amount of plant costs for minimum-size equipment are demand-related and thus misclassified as customer-related.

<sup>14</sup> In contrast to the Minimum System method, which sets the minimum cost at the cost of the minimum-size equipment used by the utility, where such minimum-size equipment may be large enough to cover average residential load.

1 Apart from these problems of misclassification, both approaches overstate the minimum  
2 (i.e., customer-related) cost *per customer* because they assume that a minimum system  
3 carrying minimal or zero load would have the same number of poles, conductor-feet,  
4 transformers, etc. as currently installed in a distribution system designed to carry actual  
5 distribution load. In other words, the Minimum System and Zero Intercept methods  
6 assume that each piece of distribution equipment would serve the same number of  
7 customers on average, regardless of whether the customers are average-sized (as for the  
8 actual system) or have minimal or zero demand (as for the hypothetical minimum  
9 system.)

10 This is not a realistic assumption, since even a minimally sized piece of distribution  
11 equipment should be able to serve more minimal-demand customers than the number of  
12 average-demand customers served by average-sized distribution equipment.

13 Consequently, the true minimum cost to serve a customer with minimal usage is likely to  
14 be less than the customer-related cost per customer derived using minimum system  
15 analyses. Indeed, since the Zero Intercept method estimates the minimum cost for  
16 hypothetical equipment that serves zero load, the true minimum cost per customer must  
17 be zero since distribution equipment that carries zero load can serve an infinite number of  
18 customers with zero load.

1 **Q: Is there a more-reasonable approach for classifying distribution plant costs and**  
2 **estimating the embedded customer-related cost per residential customer?**

3 **A:** Yes. A reasonable and reasonably straightforward approach, and one that has been used in  
4 other jurisdictions across the U.S., is to classify meters and services as customer-related  
5 and all other distribution plant costs as demand-related.<sup>15</sup>

6 **Q: Have you estimated the customer-related cost per residential customer under this**  
7 **alternative approach?**

8 **A:** Yes. I modeled this alternative classification approach by modifying a version of the 2016  
9 CCOSS spreadsheet model provided by NSPM in response to CEO Information Request  
10 No. 1.<sup>16</sup> Specifically, I modified the spreadsheet model so that 100% of overhead,  
11 underground, and line transformer costs would be classified as demand-related and 100%  
12 of service costs would be classified as customer-related. With these modifications, the  
13 2016 CCOSS derives a customer-related cost of \$5.97 per residential customer per  
14 month.

15 To put this in perspective, the current customer charge of \$8.72 per month is already  
16 nearly 50% higher than the embedded customer-related cost derived under this alternative  
17 classification approach.

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<sup>15</sup> According to a study by the Regulatory Assistance Project, this approach is employed in more than thirty states. *See* Frederick Weston, Charging for Distribution Utility Services: Issues in Rate Design, Regulatory Assistance Project, 30 (Dec 2000), attached to this testimony as Schedule 4.

<sup>16</sup> Xcel's supplemented response to CEO Information Request Number 1 is attached to this testimony as Schedule 5.

1 **Q: What does this result tell us about cost subsidization within the residential class?**

2 **A:** The fact that the current customer charge exceeds the embedded customer-related cost  
3 derived under my alternative classification approach indicates that a sizeable portion of  
4 demand-related distribution plant costs are being recovered through the current customer  
5 charge. This means that residential customers with below-average usage currently bear a  
6 disproportionate share of demand-related distribution plant costs and consequently  
7 subsidize larger customers under current rates, not the other way around as Mr. Huso  
8 contends.

9 **Q: How would a change in the customer charge affect cost subsidization within the**  
10 **residential class?**

11 **A:** Since the current customer charge already exceeds the embedded cost to serve residential  
12 customers, increasing the customer charge would exacerbate the subsidization of high-  
13 usage customers' costs by low-usage customers. Decreasing the customer charge, on the  
14 other hand, would reduce the subsidy payment from low-usage to high-usage residential  
15 customers.

16 **Q: Please summarize your findings and conclusions regarding the issue of intra-class**  
17 **cost subsidization.**

18 **A:** The Company relies on the results of the 2016 CCOSS to support its contention that an  
19 increase in the residential customer charge would mitigate subsidization of low-usage  
20 customers by customers with above-average usage. However, the 2016 CCOSS relies on  
21 a flawed method for classifying distribution plant costs which overstates the customer-  
22 related cost to serve residential customers.



1 In fact, a more-reasonable approach for classifying distribution plant costs yields an  
2 estimate of customer-related costs that is less than the current customer charge. This  
3 result indicates that low-usage customers are currently subsidizing high-usage customers,  
4 not the other way around as claimed by NSPM. Thus, the Company's proposal would  
5 exacerbate cost subsidization within the residential class and diminish rate affordability  
6 for low-usage customers.

7 The Commission should therefore give no weight to the results of the 2016 CCOSS for  
8 the purposes of assessing intra-class cost subsidization or for setting the customer charge  
9 for the residential class. If the Commission opts to address subsidies within the residential  
10 customer class, the results of the alternative classification approach described above  
11 suggest that a *reduction*—not an increase—in the customer charge would be warranted to  
12 mitigate subsidization of high-usage customers' costs by low-usage customers.

#### 13 **IV. ECONOMICALLY EFFICIENT PRICE SIGNALS**

14 **Q: Would setting the customer charge to reflect embedded customer-related costs  
15 improve price signals, as Mr. Huso contends?**

16 **A:** No. If the fixed customer charge exceeds incremental connection costs, the usage-based  
17 energy charge will understate the extent to which the Company's costs are driven by  
18 customer usage. The Company's proposal to recover a larger share of embedded costs  
19 through the customer charge would shift recovery of costs to the customer charge that are  
20 more appropriately recovered through the energy charge. Contrary to Mr. Huso's  
21 assertion, such a cost shift would dampen price signals and discourage economically  
22 efficient conservation by residential customers.

1 **Q: How should residential energy and customer charges be set in order to provide**  
2 **appropriate price signals and encourage conservation?**

3 **A:** Energy charges should be set at levels that recover costs that tend to increase with  
4 customer usage. This includes costs directly driven by customer usage, such as  
5 generation, transmission, substations, and distribution conductor sizing and number.  
6 Energy charges should also include costs that tend to rise with customer usage level but  
7 are not directly caused by customer usage. Examples of this latter category might include  
8 bad debt, the costs associated with adding line transformers to avoid long runs of  
9 secondary with high loads, or the additional distribution costs between very large  
10 suburban homes, as opposed to close-packed urban duplexes or apartments.

11 In contrast, the customer charge is intended to reflect the incremental costs imposed by  
12 the continued presence of a customer who uses very little energy. Thus, the customer  
13 charge should not be expected to cover all customer-related costs for the average  
14 residential customer, but only the incremental cost to connect one more very small  
15 customer.<sup>17</sup> Since NSPM would probably not need to add secondary conductor or a  
16 transformer to connect a very small customer, incremental connection costs would be  
17 limited to installation and maintenance costs for a service drop and meter, along with  
18 meter-reading, billing, and other customer-service expenses.<sup>18</sup>

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<sup>17</sup> See, e.g., Jim Lazar & Wilson Gonzalez, Smart Rate Design for a Smart Future, Regulatory Assistance Project, 36 (July 2015), attached to this testimony as Schedule 6.

<sup>18</sup> Remote residences might also require a line extension and a small transformer in order to connect to the distribution system. On the other hand, customers located in a multi-family building would probably not require their own service drop.

1 **Q: What is the incremental cost to connect a residential customer in the Company's**  
2 **service territory?**

3 **A:** Using a version of the 2016 CCOSS spreadsheet model provided by NSPM in response to  
4 CEO Information Request No. 1, I estimate an incremental connection cost ranging from  
5 \$5.74 to \$7.32 per customer per month. The lower estimate includes the cost for a  
6 minimum-size service drop, while the higher estimate includes the cost for an average-  
7 size service drop and for a minimum-size transformer.

8 The \$10.72 customer charge proposed by NSPM overstates my estimated incremental  
9 connection cost by about 50%–90%. The excess over incremental connection cost  
10 represents usage-related costs that would be recovered through the customer charge under  
11 the Company's proposal. Thus, the Company's proposal to increase the residential  
12 customer charge would dampen price signals by inappropriately shifting recovery of  
13 usage-related costs from the energy charge to the customer charge.

14 **Q: How does the Company's proposal to increase the residential customer charge by \$2**  
15 **per month affect the residential energy rate?**

16 **A:** With the residential customer charge set at an average of \$10.72, I estimate that the  
17 annual energy rate, including fuel and on average across seasons, would increase to  
18 11.998¢/kWh in order to recover the proposed allocation of 2016 test year revenue  
19 requirement to the residential class.<sup>19</sup> If, instead, the customer charge remained at its  
20 current average rate of \$8.72, the annual energy rate would have to be increased to

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<sup>19</sup> Based on data provided in the Company's Revenue Model spreadsheet RevModMnTY16TCR.xlsx.

1 12.316¢/kWh to recover the same allocated revenue requirement.<sup>20</sup> Thus, the annual  
2 energy rate under the Company's proposal to increase the monthly customer charge by \$2  
3 would be 0.3¢/kWh, or about 2.6%, less than the energy rate without the proposed  
4 increase to the customer charge.

5 **Q: To what extent would the lower energy rate under the Company's proposal for the**  
6 **customer charge dampen price signals for conservation?**

7 **A:** Residential customers respond to the price incentives created by the electrical rate  
8 structure. Those responses are generally measured as price elasticities, i.e., the ratio of the  
9 percentage change in consumption to the percentage change in price. Price elasticities are  
10 generally low in the short term and rise over several years, because customers have more  
11 options for increasing or reducing energy usage in the medium to long term. For example,  
12 a review by Espey and Espey (2004) of thirty-six articles on residential electricity  
13 demand published between 1971 and 2000 reports short-run average-rate elasticity  
14 estimates of about -0.35 on average across studies and long-run average-rate elasticity  
15 estimates of about -0.85 on average across studies.<sup>21</sup>

16 Studies of electric price response typically examine the change in usage as a function of  
17 changes in the marginal rate paid by the customer. Table 1 lists the results of seven  
18 studies of marginal-price elasticity over the last forty years.<sup>22</sup>

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<sup>20</sup> *Id.*

<sup>21</sup> In other words, on average across these studies, consumption decreased by 0.35% in the short term and by 0.85% in the long term for every 1% increase in average rates. This study is provided as Schedule 7 to this testimony.

<sup>22</sup> The citations for these studies are provided in Schedule 8 to this testimony.

1 **Table 1: Summary of Marginal-Price Elasticities**

<b>Authors</b>	<b>Date</b>	<b>Elasticity Estimates</b>
Acton, Bridger, and Mowill	1976	-0.35 to -0.7
McFadden, Puig, and Kirshner	1977	-0.25 without electric space heat and -0.52 with space heat
Barnes, Gillingham, and Hageman	1981	-0.55
Henson	1984	-0.27 to -0.30
Reiss and White	2005	-0.39
Xcel Energy Colorado	2012	-0.3 (at years 2 and 3)
Orans et al, on BC Hydro inclining-block rate	2014	-0.13 in 3 <sup>rd</sup> year of phased-in rate

2 **Q: What would be a reasonable estimate of the marginal-price elasticity for changes in**  
3 **the residential energy rate?**

4 **A:** From Table 1, it appears that -0.3 would be a reasonable mid-range estimate of the  
5 impact over a few years.

6 **Q: What would be a reasonable estimate of the effect on energy use from a 2.6%**  
7 **reduction to the annual energy rate under the Company's proposal to increase the**  
8 **customer charge?**

9 **A:** An elasticity of -0.3 and a 2.6% reduction in marginal energy price would result in an  
10 increase in energy consumption of about 0.8%. This means that all else equal, residential  
11 load would be expected to increase by almost 0.8% over a several-year period as a result  
12 of implementing the Company's proposed customer charge increase.

13 For comparison, I estimate that the Company's 2016 goal for energy savings from  
14 Conservation Improvement Program (CIP) residential programs amounts to a reduction

1 of about 1.2% of residential sales.<sup>23</sup> Thus, the consumption increase due to the  
2 Company's proposed increase to the residential customer charge (and the resulting  
3 decrease in the energy charge) would undo about two-thirds of the 2016 CIP goal for  
4 residential energy-efficiency savings.

5 **V. CONCLUSIONS AND RECOMMENDATIONS**

6 **Q: What do you conclude with respect to the Company's proposal to increase the**  
7 **residential customer charge by \$2?**

8 **A:** Contrary to statute, the Company's proposal would inappropriately shift recovery of  
9 usage-related costs from the energy charge to the customer charge, unreasonably dampen  
10 energy price signals, and discourage conservation by residential customers. It would also  
11 unjustly increase the subsidization of high-usage customers by low-usage customers,  
12 which is already a problem under the current customer charge. Accordingly, the  
13 Commission should reject the Company's request to increase residential customer  
14 charges by \$2.

15 **Q: Does this conclude your direct testimony?**

16 **A:** Yes.

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<sup>23</sup> The 2016 energy savings goal is provided in Minnesota Electric and Natural Gas Conservation Improvement Program, 2016 Extension Filing, Docket No. E, G002/CIP-12-447 (June 1, 2015).

STATE OF MINNESOTA  
OFFICE OF ADMINISTRATIVE HEARINGS  
FOR THE PUBLIC UTILITIES COMMISSION

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

**AFFIDAVIT OF SERVICE**

MPUC Docket No. E-002/GR-15-826

STATE OF MINNESOTA    )  
  )ss.  
COUNTY OF RAMSEY    )

Erin Mittag, being duly sworn, says that on the 14<sup>th</sup> day of June, 2016, she served via U.S. mail and e-dockets the following:

- Direct Testimony and Schedules of Jonathan F. Wallach, filed on behalf of Clean Energy Organizations

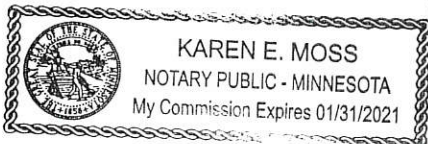
on the following persons, in this action, by filing through e-dockets or mailing to them a copy thereof, enclosed in an envelope, postage prepaid, and by depositing the same in the post office at St. Paul, Minnesota, directed to said persons at the last known mailing address of said persons:

Attached Service List.

  
Erin Mittag

Subscribed and sworn to before me  
this 14<sup>th</sup> day of June, 2016

  
Karen Moss



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