

Testimony
of
Peter T. Zschokke

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1 **I. Introduction**

2 **Q. Mr. Zschokke, would you please state your full name and business address?**

3 A. Peter T. Zschokke, 25 Research Drive, Westborough, MA 01582.

4
5 **Q. Mr. Zschokke, by whom are you employed and in what position?**

6 A. I am Vice President of Regulatory Strategy and Research for National Grid USA.

7
8 **Q. Mr. Zschokke, please describe your educational background and training?**

9 A. In 1979, I graduated from Boston University with a Bachelor of Arts degree in
10 Economics. In 1981, I received a Master of Arts degree in Economics from Boston
11 University.

12
13 **Q. Mr. Zschokke, please describe your professional experience.**

14 A. I began employment in the electric utility industry in 1983 at Central Vermont Public
15 Service Corporation as an Economic Analyst responsible for the Marginal Cost of Service
16 Study, short-term sales forecasts, load research and economic analysis. Since then, I have
17 worked on regulatory rate issues for 20 years out of the past 24. In 1986, I began my
18 career at National Grid as a Rate Analyst in the Rate Department of, at the time, New
19 England Power Service Corp. Throughout my career at National Grid, I have been given
20 positions of increasing responsibility in regulation. In my various managerial positions, I
21 was responsible for the rates and tariffs of the distribution affiliates of National Grid
22 USA, including Granite State Electric Company and, as an analyst, the design of time-of-

1 rates, allocation methods, computer methods, allocated cost-of-service studies, load
2 research issues and marginal cost rate design. In addition to my positions dealing with
3 retail regulatory issues, I was promoted to Vice President Business Services of The
4 Narragansett Electric Company (“Narragansett”) in 1998 and served in that capacity for
5 two years. As Vice President, my duties included supervision of customer service for
6 Narragansett’s large accounts, supervision of DSM programs for the company, municipal
7 relations and load forecasting. In 2003, I was promoted to Vice President, Regulatory
8 Affairs for the Transmission group for National Grid USA in which I was responsible for
9 regulatory issues for transmission at the State level. Finally, in August 2004, I was given
10 an assignment at National Grid's corporate offices in London in Group Strategy. In this
11 assignment, I was responsible for analysis and study of various energy industry issues of
12 import to National Grid's business strategy.

13
14 **Q. Mr. Zschokke, have you previously testified before the Commission?**

15 A. Yes, I have testified before the Commission on many different rate related matters which
16 include allocated cost of service studies, rate design, rate recovery and reconciliation
17 factors, and other issues.

18
19 **II. Purpose of Testimony**

20 **Q. What is the purpose of this testimony?**

1 A. The purpose of the testimony is to respond to the Commission's offer for parties to
2 provide testimony on compliance with the Energy Policy Act of 2005 ("EPACT")
3 standard relating to the issues of advanced metering and time-based rates. The testimony
is divided into two parts.

First, National Grid is very interested in taking this opportunity to offer a specific and
practical proposal to advance the goals of the Commission, as they were set forth in the
June 22 Order in this docket. Specifically, instead of moving its large commercial and
industrial customer class to a three period time-of-use program, as outlined by the
10 Commission in its June 22 Order, National Grid is proposing an innovative trial program
11 that would place these customers on hourly pricing that will closely tie commodity costs
12 for this class to the real-time costs in the New England market. Thus, the first part of
13 this testimony focuses on an offer by National Grid to implement an hourly pricing
14 program on a trial basis, in lieu of three period time-of-use rates. The second part of the
15 testimony then focuses on the costs of actually implementing three period time-of-use
16 rates for each of the Company's rate classes, in order to provide important information to
17 the Commission in its policy-making process. In summary, National Grid is supporting
18 the Commission's policy to create demand response through commodity pricing.
19 Reducing demand not only can lower costs, but also brings significant environmental
20 benefits through the reduction of carbon emissions due to the reduced need for energy
21 production. However, National Grid suggests that any time-based commodity pricing be

1 done in a phased fashion, starting with the largest customers first, before moving down to
2 the other commercial customer classes. The Company does, however, urge caution by the
3 Commission before requiring any time-of-use commodity pricing and advanced metering
4 for small commercial and residential customers.

5
6 **III. Implementing Day-Ahead Hourly Pricing¹ for G-1 Customers**

7 **Q. Taking into account the policy objectives stated in the Commission's June 22 Order,**
8 **what is National Grid's position?**

9 A. National Grid supports the Commission's objective of encouraging demand response
10 through *cost effective* time-based pricing programs. The Company believes that moving
11 our largest commercial and industrial (C/I) customers to time-differentiated commodity
12 pricing presents the best opportunity to achieve the Commission's goal. For reasons that
13 will be explained in this testimony, however, National Grid believes it is preferable to
14 move directly to hourly pricing for its G-1 rate class on a trial basis, instead of employing
15 a three period time-of-use program ("three period TOU"), as the Commission suggested
16 in its June 22 Order. Consistent with this view, National Grid proposes to implement
17 day-ahead hourly pricing for all of its large commercial and industrial customers in its G-
18 1 rate class based on ISO-NE's day-ahead energy market price for New Hampshire.

¹ As discussed in more detail later, the cost of energy is only guaranteed for that quantity of energy that a customer bids into the Day Ahead Market and which clears at the Day Ahead Market Clearing Price. Any energy consumption below or in excess of the cleared amount is settled up at the Real Time Market Clearing Price which could be greater or less than the Day Ahead Market Clearing Price. The Company has chosen the Day Ahead hourly prices instead of actual hourly prices in order to give customers advance notice of the prices that they will be charged for usage. Another option would be to provide actual hourly prices which could be considered once customers have adequate experience.

1 Currently the G-1 rate class consists of approximately 114 customer accounts. Upon
2 implementation, all of National Grid's G-1 customers receiving default service would be
3 billed on an hourly default service rate rather than a fixed monthly rate. For those
4 customers who take service from competitive suppliers, the Company would continue to
5 make fifteen minute interval data available for billing and settlement purposes. National
6 Grid is proposing to implement hourly pricing for an initial two to three year period. The
7 Company is not proposing this necessarily be employed statewide. As will be explained,
8 gaining this information for the small number of customers in National Grid's G-1 rate
9 class would be immensely helpful to the Commission in establishing long term policy for
10 the state on this issue.

11
12 **Q. Why is the Company proposing to move directly to hourly pricing, rather than three**
13 **period time-of-use pricing?**

14 A. National Grid does not believe that merely differentiating commodity prices into three
15 periods will advance the goals of the Commission to achieve demand response for this
16 rate class, nor will such service offering help to significantly augment the breadth of
17 offerings from competitive suppliers. National Grid is concerned that the prices
18 associated with moving solely to a three period TOU program do not create a sufficient
19 incentive for customers to reduce load on the highest price hours of the day or billing
20 period, and the cost of providing such a TOU rate may, therefore, not be justified by the
21 resulting benefits. The highest peak hours National Grid serves occur in just ½ % of the

1 annual number of hours which may occur on any day of the year (generally during the
2 summer and winter months) and the goal of demand response programs is to reduce the
3 peak in those hours. A three period TOU rate which fixes prices in advance cannot
4 accurately signal to customers exactly when the highest price hours occur so that
5 customers may consider modifying usage in those hours and, thereby shave the system-
6 wide peak. Accordingly, the Commission's demand response goal would not be
7 achieved. However, if the Company implements hourly pricing based on the day-ahead
8 market for its largest customers, the Company believes it has a much higher likelihood of
9 successfully achieving the Commission's demand response objectives of shaving peak
10 demand. National Grid believes day-ahead hourly pricing is far more likely to change
11 customer usage patterns during peak periods of the year when these customers see the
12 posting of energy prices that will be applied the following day. Thus, day-ahead hourly
13 market-based pricing presents the obvious advantages of better reflecting what is really
14 happening in wholesale energy markets at a given time (which cannot be seen in an
15 administratively determined TOU rate - probably set weeks or months in advance).

16 National Grid also believes that its largest commercial and industrial customers are more
17 likely to embrace the opportunity to receive hourly price signals determined by the market
18 rather than a three period TOU rate which may include a substantial hedge premium. For
19 these reasons, National Grid believes hourly pricing based upon the day-head market is
20 the most practical way to support the Commission's objectives for these large customers.
21

1 **Q. What about the Commission's expressed hesitancy to move to a real-time pricing**
2 **program that is mandatory?**

3 A. In the Commission's June 22 Order, the Commission expressed reluctance to move to
4 hourly pricing for all default service customers. National Grid believes this was a wise
5 choice, when considered for all rate classes. However, when considering the next step for
6 large customers, National Grid believes it is reasonable to go further and require hourly
7 pricing. National Grid's past offerings of enhanced metering services have enabled
8 customers to seek voluntary dynamic rate structures from competitive suppliers or
9 through direct participation with ISO-NE; however, to date, few customers seem to have
10 taken advantage of this opportunity. The utilities' monthly default service rate is often
11 used as a benchmark for competitive suppliers to develop their offerings. In the June 22
12 Order, the Commission indicated a desire to observe "how large customers respond to
13 time-of-day rates before considering mandatory pricing." (p. 20) Again, the idea of
14 observing the response of large customers to time differentiated rates is a prudent path.
15 But in the context of large customers, National Grid believes it is far more useful to see
16 how large customers respond to an hourly pricing program. As stated earlier in this
17 testimony, National Grid is concerned that the three period TOU rate will not deliver
18 demand response in the hours most needed. It would be far better to place these
19 customers on hourly pricing.

20
21 **Q. Why is National Grid well suited to perform this trial program?**

1 A. The Company in New Hampshire has a very manageable number of customers in the G-1
2 rate class. Currently, there are only about 114 customer accounts. Regular reports could
3 be provided to the Commission on this customer group. In addition, to the extent there
4 are customers who would find the variable pricing inappropriate for their business needs,
5 National Grid is well-positioned to direct these customers to a list of competitive
6 suppliers offering fixed supply agreements. In fact, while there are technically about 114
7 customer accounts in the G-1 class today, 36 of those accounts are already on competitive
8 supply. Thus, assuming those 36 customers remain on competitive supply once the
9 program is launched; only 78 customers actually would be placed on the hourly pricing,
10 unless and until they move to competitive supply themselves.

11
12 **Q. Is National Grid able to implement hourly pricing from a technical perspective?**

13 A. Yes. National Grid is in the unique position of being able, in the near future, to
14 implement hourly pricing with its new CSS billing system. The CSS system is scheduled
15 to be on line by the end of this year, however, further modifications to the CSS system
16 will be necessary in order to implement the hourly pricing program.

17 National Grid has had many years of experience with exactly such a program in New
18 York. Since 1998, all (290) customers with demands over 2,000 kW have been placed on
19 hourly commodity billing and those who take commodity service from National Grid are
20 billed at an hourly price indexed to the NYISO's hourly Day-Ahead Location Based
21 Marginal Price (DALBMP). Today, all customers with demands of 500 kW and above

are subject to day-ahead hourly pricing to the extent they are not purchasing commodity from competitive suppliers. There are now over 900 commercial and industrial customers in New York who are subject to hourly commodity billing. Over 25% (250) of these customers are billed for commodity based on an hourly price indexed to the NYISO DALBMP under the Company's default service.

Q. What about metering and communications requirements?

A. National Grid already has fifteen minute interval meters in place for the entire G-1 rate class for hourly billing. As a result, National Grid could implement the program with the current meters. However, there is currently no communication link to these meters that would enable customers to have near real-time access to the interval data to manage their load effectively. Thus, in order to provide the tools to manage load, National Grid proposes to replace the 114 interval meters with digital wireless meters embedded with Internet Protocol (IP) addressable technology. The Company has utilized this technology extensively in New York to implement its hourly pricing for large customers and believes such an approach increases the likelihood of achieving the Commission's objectives.

Q. Are there any other changes that would be needed?

A. Yes. While an hourly pricing program using the hourly day-ahead market prices published by ISO-NE provides a simple basis for communicating price signals to customers on a timely basis and provides a known basis for billing calculations, this

1 signal is not fully reflective of the actual costs associated with serving a customer's power
2 supply requirements in the hour. In addition to capacity market charges, ancillary service
3 charges and ISO-NE tariff charges, the cost of energy is only guaranteed for that quantity
4 of energy that a customer bids into the day-ahead market and which clears at the day-
5 ahead market clearing price. Any energy consumption below or in excess of the cleared
6 amount is settled up at the real-time market clearing price which could be greater or less
7 than the day-ahead market clearing price. Exhibit 1 lists the market elements that are
8 associated with service to customers in the New England market. Each of these elements
9 must be factored into the total charges billed to the hourly pricing customer. The
10 Company estimates the capacity cost adder based on the transition period rules to be
11 approximately 1 cent per kWh. Losses, based on data for the most recent twelve month
12 period in New Hampshire would add approximately an additional 5%. Thus, billing
13 customers solely on the basis of a day-ahead market price signal would not reflect the full
14 cost of providing service to the customer. It should also be noted that there are times
15 when the day ahead and real-time prices can diverge dramatically thus setting up periods
16 when customers are not receiving the true price signal for the cost. To properly
17 implement an hourly pricing program, a protocol for determining the appropriate price
18 signal to customers which fully reflects the cost of the power they consume must be
19 developed as well as a protocol for bidding customer loads into the day-ahead market.
20 The Company can determine the relative cost of the various elements over a recent
21 historical period and apply an adder to the hourly day-ahead price and use the adjusted

1 hourly price as the price signal to customers as well as the billing price for the hour. The
2 adder could be in the form of a multiplier (for example, 103%) of the day-ahead market
3 clearing price or a fixed adder (for example, \$1.57 per MWh) to the day-ahead market
4 clearing price. A method for reconciling actual costs to revenues must also be developed.
5 In New York, the Company's affiliate applies a uniform adder for each hour of the month
6 (capacity costs are applied to on-peak hours only, whereas all other market costs are
7 applied on an all-hours basis) based on average costs on a two-month lag basis. For
8 example, the adder for July is based on costs billed to the Company as well as reconciled
9 in May. The Company anticipates it may take one to three months to develop a method
10 for determining the protocol to establish the hourly price signal. A protocol for sending
11 the hourly price signal to customers must also be developed. In New York, the
12 Company's affiliate has implemented a plan whereby its Meter Data Services department
13 is responsible for obtaining the hourly NYISO day-ahead market prices for the day,
14 applying the fixed adder for ancillary and other services for each hour which is provided
15 by its Energy Supply department, and then posting the adjusted hourly prices on a website
16 for customers to utilize as well as posting the price to the billing system.

17
18 **Q. In past proceedings in New Hampshire, National Grid has expressed caution in**
19 **moving toward hourly pricing for its G-1 class. Why is National Grid willing to**
20 **propose this now?**

21 **A. In the past, National Grid has been concerned about:**

- 1 (1) A billing system that could not accommodate hourly pricing in New Hampshire;
- 2 (2) The potential effect on the competitive market of offering hourly pricing;
- 3 (3) Financial impact on customers from energy price spikes;
- 4 (4) Exposing poorly equipped customers to volatile prices; and
- 5 (5) Stranded technology investments.

6
7 Each of these concerns will be addressed separately in this testimony.

8 **Q. What about the billing system?**

9 A. As explained earlier in the testimony, National Grid is converting its current CIS system
10 to a new CSS system. With some modifications discussed further below, the new CSS
11 system will be able to accommodate hourly pricing. For that reason, this is no longer a
12 concern for National Grid.

13
14 **Q. What about the potential effect on the competitive market?**

15 A. In the past, we were concerned that a utility-sponsored hourly pricing program would
16 preempt the ability of competitive suppliers to offer such programs to businesses. While
17 this remains true theoretically, as a practical matter we have seen few customers
18 interested in moving to competitive suppliers in order to voluntarily obtain hourly pricing.
19 Customers have tended to move to suppliers for either a lower fixed price, a stable longer
20 term price, or other pricing that may fit the business usage pattern of the customer. In
21 fact, we have heard from suppliers who would prefer that utilities base default service

1 programs on hourly pricing. While suppliers can speak for themselves regarding the
2 reasons why, National Grid believes it is largely based on the assumption that customers
3 who do not like the variable nature of hourly pricing will opt to go to suppliers to achieve
4 stability. While National Grid remains concerned that it may not be appropriate today to
5 put small or residential customers in such a situation, large commercial and industrial
6 customers have access to several active competitive suppliers offering such hedging
7 services and are quite capable of taking the steps necessary to change their commodity
8 service in an educated manner.² For example, in response to a recent survey conducted in
9 New York, 52% of the competitively supplied customers who moved to hourly
10 commodity billing in the fall of 2006 report that at least part of their supply arrangement
11 with competitive suppliers is based on hourly prices. For all these reasons, National Grid
12 has altered its earlier view about hourly pricing negatively impacting the competitive
13 market.

14
15 **Q. What about financial impacts on customers from energy price spikes?**

16 A. To the extent there is a day in which prices spike dramatically, it could have a detrimental
17 effect on businesses that do not reduce usage during the high price hours. This would be
18 particularly worrisome to the extent that commodity prices actually charged for default
19 service floated in real time intervals, rather than on a day-ahead basis. It also remains a
20 concern for customers who are less sophisticated about following energy prices and

² Although customers who choose such hedging options instead of reducing demand may pay a premium for a fixed rate, the customer would get the benefit of consuming during hours with high price spikes.

1 understanding their impact on electric bills. However, based on National Grid's
2 experience in New York, the day-ahead market-based pricing reduces the risk
3 considerably when employed with large commercial and industrial customers. To the
4 extent there is a dramatically high price published the day before, there will be time for
5 customers to react to the price. In fact, this is exactly what the Commission appears to be
6 aiming to do -- obtain a demand response when prices spike. Offsetting these concerns is
7 the fact that current monthly default service pricing contains a risk premium that all
8 wholesale energy suppliers factor into their bids during our competitive procurement.
9 With implementation of day-ahead hourly pricing, the cost of this risk premium should be
10 eliminated. While it is impossible to determine its precise cost, the Company estimates
11 that elimination of the risk premium could reduce average default service costs. In
12 addition, in conjunction with a carefully designed customer education and outreach
13 program, National Grid is confident that customers will be equipped to take actions to
14 protect themselves from price spikes.

15
16 **Q. What about the risk of exposing poorly equipped customers to volatile prices?**

17 **A.** Like the prior risk, this concern remains valid. However, National Grid is not proposing
18 a statewide program across all rate classes. Rather, the Company is proposing a very
19 limited program that would initially apply to only 78 to 114 customers. National Grid
20 would work closely with the Staff of the Commission to develop a customer education
21 program similar to that used by its New York affiliate in its hourly pricing program

1 implemented in 2006. In addition, the Company would send its representatives to visit
2 with customers, and explain how under the existing Demand Side Management (“DSM”)
3 programs, studies can be undertaken to assess the customer’s opportunities for both
4 energy efficiency measures as well as specific demand response actions customers can
5 elect to undertake. Because the trial program is limited to the largest customers and the
6 number is manageable, National Grid believes this risk is limited and can be mitigated.
7 Moreover, with the implementation of the program, presumably competitive suppliers
8 will see this as an opportunity to identify those customers who would be most in need of
9 stable pricing and offer suitable commodity service arrangements to completely eliminate
10 the risk.

11
12 **Q. Does the Company have a plan to assist customers in mitigating price spikes?**

13 A. Yes, as referred to above, approximately \$25,000 out of the current DSM program funds
14 will be used to provide demand response audits for interested customers. These audits
15 also identify potential energy efficiency improvements as well. In addition, the Company
16 is working to modify the incentive structure for energy efficiency projects to possibly
17 include additional funds to make an energy efficiency measure demand responsive. An
18 example of this would be paying a higher incentive to a customer who can show that their
19 energy management system which controls their HVAC and lighting systems has some
20 level of load shed capability, and/or can automatically adjust energy usage based on
21 pricing (e.g., if prices went about 20¢ per kWh, the HVAC system would automatically

allow temperatures in the facility to rise one or two degrees, etc.). If the Company determines the need for these types of audits exceeds the budgeted \$25,000 due to customer interest, the Company would seek to allow additional funds to be used.

5 **Q. Are there other initiatives the Company currently provides for customers to**
6 **promote demand response?**

7 A. Yes, the Company offers both the ISO-NE Price Response Program (“PRP”) as well the
ISO-NE Emergency Demand Response Program (“EDRP”) to its customers. The ISO-
NE PRP is a voluntary program and is called whenever the ISO-NE accepts day-ahead
bids exceeding 10¢ per kWh. The Company has four customers participating in this
program. When called, customers receive either a minimum of 10¢ per kWh, or the
12 actual hourly clearing price for documented load reductions. In effect, this program
13 provides the reverse of hourly pricing by offering an hourly credit for customer load
14 curtailment activities. The ISO-NE EDRP is another program that pays customers the
15 monthly capacity costs as a credit (currently \$3.05/kW grossed up for losses and reserves,
16 or about \$3.50/kW), but requires load reductions when called during a system emergency.
17 If a customer does not comply, future capacity credits are lost. To date, the Company has
18 not directly enrolled any customers in this program, but is aware that third-party
19 curtailment service providers (“CSPs”) have enrolled some NH customers. To the extent
customers begin to see hourly pricing, there may be more opportunities to market the
programs in New Hampshire.

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Q. What about the risk of stranded technology investments?

A. In the past National Grid has been concerned about implementing technology solutions to promote demand response that result in customers moving to competitive suppliers for a fixed commodity price instead of implementing demand response measures. To a certain extent, these concerns remain today. However, National Grid is willing to implement a day-ahead hourly pricing program for the G-1 rate class as a means to gain valuable information about customer decisions once placed on hourly pricing. National Grid believes that effective demand response cannot happen without appropriate price signals that the day-ahead hourly market is well equipped to provide. As a result of implementing this program, customers who cannot shift load may well seek competitive market alternatives for fixed rate service and pay a risk premium. However, at that point the Commission will have facts to ascertain whether customers respond to price signals through demand response or by taking hedged service from a competitive supplier. On the basis of this information, the result of the initial two to three year implementation will help the Commission to determine the future scope and use of hourly pricing and other demand response pricing programs for National Grid, other utilities and groups of customers. In the event that demand response is limited because customers are going to the competitive market for fixed prices, the Commission can adjust the program if it remains concerned that not enough demand response is available.

1 **Q. Are all the details of the program in place?**

2 A. No. But if the Commission accepts National Grid's proposal, the Company proposes to
3 make a second filing that sets forth in greater detail all the implementation details,
4 including technology, timing, more refined estimates of costs, customer education, tariff
5 changes, rate recovery, and other details.

6
7 **Q. What is the estimated time required to implement the proposed hourly pricing
8 program, including all modifications to the metering and billing systems?**

9 A. The CSS system is scheduled to be implemented by the end of the year. Following
10 implementation of CSS, the Company anticipates that a transition period of
11 approximately six months will be necessary before any changes related to implementing
12 an hourly pricing program could be made to CSS. Once the transition period is over, the
13 Company could implement necessary changes to CSS in approximately three to six
14 months. It is also estimated that changes to the metering systems would require
15 approximately six months to implement. Based upon these estimates, the earliest that
16 National Grid could implement the proposed program would be sometime in the last
17 quarter of 2008 depending upon the length of the transition from CIS to CSS. The CSS
18 implementation period will provide time for education of customers on the G-1 rate.

19
20 **IV. Incremental Costs of Day-Ahead Hourly Pricing for G-1 Customers**

1 **Q. What would the incremental costs of the proposed day-ahead hourly pricing**
2 **program be?**

3 A. The total estimated incremental cost to implement the proposed day-ahead hourly pricing
4 program for the G-1 rate class is between \$560,000 and \$790,000. It is important to
5 stress that these figures are estimates and are intended to provide the Commission with a
6 range of possible costs. There are several components of incremental costs:

- 7 (1) Digital Wireless Meters: \$184 to \$219K (includes cost of meter, the
8 communications equipment, and the cost of installation);
- 9 (2) Modifications to National Grid's Meter Data System: \$75 to \$85K;
- 10 (3) Modifications to Customer Service System ("CSS"): \$200 to 300K;
- 11 (4) Ongoing Administrative Costs: \$25 to \$35K; and
- 12 (5) Customer Outreach and Education: \$75 to \$150K.

13
14 Each of these incremental costs is discussed separately in this testimony.

15 While aggregate program implementation costs of between \$560,000 to \$790,000 are
16 indeed significant, assuming the current energy prices and a potential default service rate
17 reduction resulting from eliminating the wholesale energy price hedge premium, savings
18 could exceed costs, even before considering the effects of any demand response.

19
20 **Q. Why does National Grid recommend digital wireless meters with IP addressable**
21 **technology?**

1 A. The Company has utilized this technology extensively in its New York affiliate to
2 implement hourly commodity pricing for large customers and believes this approach best
3 supports the Commission's objectives. This technology allows for more efficient and
4 frequent meter reading and provides the G-1 rate class customers with secure and
5 economical access to interval meter data. This type of metering system would provide
6 customers with the ability to access meter data daily. An alternative to installing digital
7 wireless technology would be to upgrade and reprogram existing meters with modem
8 boards and telephone landlines. This approach would also provide for remote access to
9 meter data at a lower up-front cost than the digital wireless approach. However, the
10 Company's experience with remote access meter connections is that landline connections
11 can be significantly more problematic than digital wireless connections. The installation
12 of landlines typically requires long lead times and significant levels of coordination and
13 scheduling between the Company, the customer, and the telephone company. The
14 installation cost may vary significantly depending upon each customer's location and
15 installation requirements; therefore, the total cost to install landlines cannot be accurately
16 estimated. It has been the experience of the Company's New York affiliate that wire-
17 based technology creates three times more maintenance calls than wireless connections,
18 and back-office and minute charges related to a landline system are four times as great as
19 for the digital wireless solution. Landline technology also limits the frequency and
20 granularity at which the customer can access the meter data and will limit the potential for
21 learning how best to enable customers to respond to price signals. In addition, a landline

1 design would increase meter reading costs by requiring a bank of modems and dedicated
2 phone lines at the head end computer system to get the customer usage information into
3 the Company's meter data repository.
4

5 **Q. What modifications to National Grid's meter data system would be required to**
6 **implement the proposal?**

7 A. The \$75,000 estimate is to build a new module to the Company's Electric Pricing system
8 used in New York to be able to develop the day-ahead prices. This estimate would be
9 approximately \$10,000 more if the Company were to use landline technology versus the
10 IP addressable meters in order to add a bank of modems and dedicated landlines to read
11 the meters.
12

13 **Q. What modifications to the CSS system would be required to implement the**
14 **proposal?**

15 A. Due to the variations within the G-1 rate (i.e. default service versus competitive supply,
16 the discounts for taking high-voltage delivery, etc.) the cost assumptions are based on
17 supporting a number of variations within the G-1 rate. Some of the specific items would
18 be: upload of interval data to CSS; programming and testing; pricing file modification
19 within CSS different from the meter data system; pricing information to and from the
20 web; competitive supplier EDI billing determinants; ISO reporting requirements; rate
21 migration triggers; and overall administrative and overhead costs.

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Q. What are the ongoing administrative costs of the program?

A. The ongoing annual costs associated with this program include the cost of data collection and conditioning, trouble-shooting remote calls, maintenance and system administration, and the cost of the wireless connection.

Q. What is National Grid proposing for customer education and outreach associated with this program?

A. National Grid’s customer education and outreach program could be based upon its program for educating hourly pricing customers of its New York affiliate, with appropriate modifications for New Hampshire customers. If the Commission were to approve the proposed hourly pricing program for G-1 customers, National Grid would expect to work with Staff of the Commission to develop an education and outreach program designed to help meet the Commission’s demand response objectives and to help customers to manage their load effectively in response to day ahead market price signals. The costs for this would be determined along with all other costs as outlined above.

Q. Once these costs are incurred, if the Commission decided to expand the program to other customer classes, how much of the incremental costs itemized above are one-time costs that would not be repeated as the program expands?

1 A. Some portion of the costs of modifying the CSS system would be one-time costs.
2 However, for each rate class most of the work would need to be repeated. In addition, a
3 small portion of the costs of modifying National Grid's Electric Pricing system would be
4 one-time costs. But, again, for each rate class separate modules would need to be
5 developed. Ongoing administrative costs would be a function of the number of accounts,
6 so these costs would rise as well. Education and outreach would likely rise substantially,
7 as less energy sophisticated customers are billed on either a TOU rate or an hourly rate.
8

9 **Q. How would the incremental costs be recovered?**

10 A. The Company has a provision in its rate plan related to exogenous events that could
11 directly address cost recovery. The Company has performed an illustrative calculation
12 for a five-year³ levelized revenue requirement, assuming incremental capital and
13 operating expenses equal to the mid point of the one-time incremental cost range of
14 \$560,000 and \$790,000. As shown on Exhibit 2, the resulting levelized annual revenue
15 requirement for the mid-level incremental costs would be approximately \$176,000 for a
16 five-year period. A five-year period was selected to coincide with the Company's five-
17 year Rate Plan Settlement as agreed to in Docket DG 06-107. As detailed on Exhibit 2,
18 Page 1, this levelized revenue requirement includes recovery of return and taxes,
19 depreciation and operating expenses. As shown in Exhibit 3, this levelized revenue
20 requirement would result in a surcharge factor to be recovered from all customer classes

³ The Company has calculated a cost for the first five years of meter operation; the metering costs have been amortized over fifteen years.

1 of \$0.00018 per kilowatt-hour. Because this program ultimately is intended to benefit all
2 customers, it is appropriate that the cost be spread over all customer classes.
3

4 **Q. What about the interval meters that would be removed?**

5 A. The interval meters would be a stranded cost. The original cost of these meters would
6 continue to be depreciated on the Company's books through the rate plan. As such, as
7 long as recovery of the new meters is included as an exogenous event, no rate adjustment
8 is necessary during the rate plan to address the stranded cost of the interval meters that are
9 removed from service.
10

11 **V. National Grid's Recommendation for Other Rate Classes**

12 **Q. National Grid has a proposal for the G-1 rate class. What is the Company
13 proposing for the other rate classes?**

14 A. National Grid strongly recommends to the Commission that the initiative toward time-
15 based pricing be taken in phases. Just as the Company is concerned that merely moving
16 to a three period TOU rate for its G-1 rate class would not materially change customer
17 behaviors, this concern is even greater as one moves from larger sized customers to
18 medium customers, to small customers, to residential customers. In other words, the
19 benefits of three period TOU appear to be few, while the costs remain significant,
20 especially when viewed in terms of increasingly smaller customers. For that reason,
21 National Grid recommends that the Commission not require the implementation of any

1 time-based commodity rates beyond the G-1 class initially. After experience is gained,
2 the next appropriate step would be for expansion of the program to medium-sized
3 customers, if warranted, i.e., economically justified. Again, any next steps should be
4 done on an initial basis to carefully assess costs and benefits, thus minimizing the risk of
5 uneconomic deployment. Then, once the day-ahead hourly pricing program has been in
6 place for a reasonable time for both large and medium sized customers, there would be
substantial additional data to evaluate in order to determine if the same or a different type
of program should be expanded to small and residential customers. In fact, National Grid
9 remains concerned that the smaller the rate class, the less appropriate that hourly pricing
10 is likely to be. However, a phased approach that starts with the largest customers and
11 scales downward is a better policy direction than incurring the costs to flash-cut to time-
12 differentiated commodity rates across all rate classes.

13
14 **Q. What is National Grid's position regarding the Commission's policy objective set
15 forth in the June 22 Order to give all metered customers the option, within a
16 reasonable time frame, to purchase their energy requirements at real-time prices?**

17 **A.** From a practical perspective, the Company is concerned about the costs that would be
18 required to implement an optional real-time or critical peak pricing program. For
19 example, while it is theoretically possible to allow customers within a class to choose an
20 optional real-time pricing program, when a few customers within a class choose a
21 particular option, all customers in the class need to also have the ability to do so, which

1 would require upgrades to metering and billing capabilities for the entire customer class.
2 This means that the Company effectively incurs the cost to implement the required billing
3 and metering changes for the entire class, in order to be able to offer the program to any
4 single customer within the class. In addition, optional commodity pricing programs
5 increase the likelihood that default service suppliers will need to add substantial risk
6 premiums to bids in order to mitigate the risk of customer migration.
7

8 **Q Couldn't the Company bill those customers who opted for real-time or critical-peak**
9 **pricing manually, rather than installing new meters and upgrading the billing**
10 **system for only a few customers?**

11 A. Theoretically, yes. However, in the Company's experience it is problematic to bill
12 customers manually for programs such as this. It is very difficult to determine how many
13 customers will elect to participate in the program in a given month, and the Company
14 might be faced with a situation where the numbers of customers participating varies
15 significantly from month to month. Also, once the number of participating customers has
16 increased to a certain level, it becomes more difficult and potentially costly to bill
17 significant numbers of customers manually. At that point, the Company would be
18 prudent to simply incur the costs to upgrade the metering and billing system to
19 accommodate the program in lieu of manual billing. Finally, billing with an automated
20 system minimizes the chance for human error to affect customer bills.
21

1 **VI. Incremental Costs of Employing TOU for All Rate Classes**

2 **A. Incremental Cost to G-1 Class**

3
4 **Q. If the Company were to implement the limited TOU program for the G-1 class, instead of the hourly pricing proposal, has the Company estimated the cost of metering and programming?**

7 **A.** Yes. The cost depends upon the option used for implementation. There is a low cost option that could implement the program, but it is somewhat inflexible once installed. There also is a second option that is more expensive, but one that facilitates changing the time-of-use periods in the future. Finally, there is a more sophisticated option that is more expensive, but has features that provide the potential for customers to be more involved in the management of their energy usage and provides more flexibility for the Company to manage the meter data.

14 **Q. Can you describe the cheapest option?**

15
16
17 **A.** Yes. The Company would send personnel to all customer locations. Most of the existing interval meters would be pulled and reprogrammed either on site or at our Worcester Meter Test facility to accommodate the three period time-of-use rate. We estimate the cost to be between \$30,000 and \$40,000. However, with this option, there would be no ability to reprogram the time periods once they are programmed into the meters, unless personnel repeated the task. Thus, every change in the program would result in the cost being incurred again.

1 **Q. Can you describe the second option?**

2
3 A. Yes. In the second option, we would leave the existing interval meters in place, but
would need to reprogram our CSS and meter data systems. We estimate the cost to be
between \$100,000 and \$150,000. The benefit of this option is that any future changes in
the time periods can then be more easily accommodated. Neither of the two options,
however, would allow the customer to link to the meter data in order to manage load. It
is for that reason that we recommend a third option.

10 **Q. What is the third option?**

11 The third option is described in the Company's response to Staff data request 2-3, which
is provided as Exhibit 4. As described in the response, the Company would replace the
existing interval data meters with digital wireless meters embedded with Internet Protocol
(IP) addressable technology. This state of the art technology allows for more efficient
and frequent meter reading and provides the G-1 rate class with secure and economical
access to interval meter data. This actually is the same technology that we would install
to implement an hourly pricing program. The total cost is estimated to be between
\$410,000 and \$505,000. This is the same cost for metering and programming that would
be applicable to an hourly pricing program. There also are other varied approaches that
are described in the response to data request 2-3. If the Commission desires to move the
G-1 class to time-of-use pricing, the Company recommends the third option.

1 **B. Incremental Cost to G-2 Class**

2 **Q. Do you have a cost estimate for implementing the three period TOU program for the**
3 **G-2 rate class, who represent medium size commercial and industrial customers?**

4 A. Yes. There are currently 832 customer accounts in this class. If the three period TOU
5 program were implemented for this class, the Company estimates the cost to be between
6 \$293,000 and \$390,000. This option would involve replacing the existing meters for
7 each customer with interval meters. Should the digital wireless meters be installed,
8 however, the cost would be in the range of \$1.3 to \$1.6 million.

9
10 **C. Incremental Cost to Small Commercial and Residential Customers**

11 **Q. How would the Company implement a three period TOU program for small**
12 **commercial and residential customers?**

13 A. The Company would need to replace all existing meters with triple encoder receiver
14 transmitter meters. Implementing the three period TOU for these customers would be the
15 most expensive of all rate classes. There are 5,384 small commercial customers in rate
16 classes G-3 and V. For these customers, the estimated cost is between \$1.3 and \$1.55
17 million. Similarly, there are approximately 35,000 residential customer accounts. We
18 estimate the cost to be between \$8.3 and \$9.8 million for residential customers. National
19 Grid strongly urges the Commission not to take this step with small and residential
20 customers due to the cost and the uncertain benefits associated with going with this
21 approach. As stated earlier in this testimony, the Company is very skeptical that a

1 program of this type will materially alter the usage behaviors of customers to a large
2 enough degree to justify the costs.
3

4 **Q. Are these cost estimates firm?**

5 A. No. The Company has made many simplifying assumptions to produce the estimates for
6 each of the rate classes. Once a program is fully planned, firmer estimates would have to
7 be developed with greater detail.
8

9 **Q. Do any of these estimates include customer education and outreach costs?**

10 A. No. The cost of customer education depends on the level of outreach desired.
11

12 **Q. What about additional administrative costs?**

13 A. The estimates above do not include additional administrative costs that would most
14 certainly occur, depending upon the program details and the applicable rate class.
15

16 **Q. Are there any other issues that would need to be considered before moving to time-
17 of-use pricing?**

18 A. Yes. The Commission would need to take into account the fact that the Company
19 already has some time-of-use pricing embedded in the distribution rates for two rate
20 classes. Specifically, the G-1 class and the D-10 residential rate class have off-peak and
21 on-peak distribution charges. To the extent that the three period TOU program is

1 introduced for either class, there could be a mismatch of pricing, unless the on-peak and
2 off-peak periods are the same. If they are kept the same and only a shoulder period is
3 added, the issue is not complicated. But to the extent a different definition of on-peak
4 and off-peak periods is introduced for commodity service than what is already used for
5 distribution, it will add to programming requirements and potentially result in
6 considerable customer confusion.

8 **VII. Conclusion**

9 **Q. Does that conclude your testimony?**

10 **A. Yes it does.**