BEFORE THE
STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

In the Matter of

Niagara Mohawk Power Corporation d/b/a National Grid

Case 12-E-0201

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Prepared Testimony of:

Gregory P. Stella
Associate Economist
Office of Regulatory Economics

State of New York
Department of Public Service
Three Empire State Plaza
Albany, New York 12223-1350

Q. Please state your name and business address.

A. My name is Gregory P. Stella. My business address is Three Empire State Plaza, Albany, NY 12223.

Q. Mr. Stella, by whom are you employed, and in what capacity?

A. I am employed by the New York State Department of Public Service (Department) as an Associate Economist.

Q. Please briefly discuss your related educational background and professional experience.

A. I hold a Ph.D. in Ecological Economics (2003) from Rensselaer Polytechnic Institute. Previously, I received Bachelor of Science and Master of Arts degrees in Economics from the State University of New York at Albany. My initial work in the field of energy sales forecasting was as an employee of the New York State Energy Office, as part of the State's Energy Master Plan process. Prior to joining the Department in 2006, my most recent work involved teaching applied forecasting techniques

as part of a course in Managerial Economics at SUNY Albany in 2004 and 2005.

Q. Have you previously filed testimony before the New York State Public Service Commission?

A. Yes, I have, most recently in Case 11-E-0408 involving Orange and Rockland Utilities, Inc., and Case 11-E-0590, involving the Village of Rockville Centre.

Q. What is the purpose of your testimony in this proceeding?

A. In response to the testimony and exhibits filed by Mr. Joseph Gredder, I am presenting Staff's recommendation for Niagara Mohawk's (henceforth the Company's) electricity sales forecast.

Q. Please briefly describe the analytical portion of your testimony.

A. My testimony will reference regression equations for customers and sales by rate class, specifically for SC1, SC2 Non-Demand, SC2 Demand, SC3, SC3A, and Street Lighting. I will compare the resulting forecasts to the Rate Year

forecasts appearing in Exhibit__(JFG-9) and Exhibit__(JFG-13CU). Taking into consideration the comparative results, I then will present my recommendations regarding the sales forecast to be used in this case.

Q. Are you sponsoring any exhibits?

A. Yes, I am. Exhibit__(GPS-1) shows my customers and gWh sales forecasts, and Exhibit__(GPS-2) shows the details of my regression results.

Q. Are you familiar with the forecasting method used by Mr. Gredder?

A. Yes, I am.

Q. Please describe the method he used.

A. Forecasts for individual rate classes were obtained in multiple steps, through a blending of rate class specific and revenue class (Residential, Commercial, and Industrial) aggregate forecasts. First, historical customer counts and sales for each rate class were divided into their applicable components. Like components were then aggregated into a revenue

class, and these aggregate Residential, Commercial, and Industrial totals were forecast econometrically, using the equations shown in Exhibit__(JFG-16). Next, a monthly forecast for each one of the individual customers and sales components was also done, via the application of a calculated growth rate to the corresponding monthly (non-weather normalized) number from the prior year (see Exhibit__(JFG-17CU), attachment 2a_Ind). These individual trended forecasts were then used to develop month-specific revenue class allocation factors. Applying the allocation factors to the econometrically forecast revenue class totals produced adjusted component forecasts, and the re-aggregation by rate class of these adjusted component forecasts yielded the customer count forecasts shown in Exhibit__(JFG-6), and the preliminary sales forecasts shown in Exhibit__(JFG-7CU) and Exhibit__(JFG-8CU). Finally, the projected incremental Energy Efficiency reductions shown in Exhibit__(JFG-11) were applied to the preliminary sales forecasts, producing Mr. Gredder's ultimate sales forecasts by rate

class, shown in Exhibit__(JFG-13CU).

Q. Did you use a similar method to produce your sales forecasts?

A. No, I did not.

Q. Why did you choose to use a different method?

A. I have two general concerns with the method used by Mr. Gredder. First, while there is nothing wrong *per se* with the derivation of forecasts via allocation factors, forecast accuracy depends upon the allocation factors themselves being as accurate as possible. This, in turn, suggests that the accuracy with which the underlying components can be forecast should be factored into the calculations – but it was not.

Q. Please give a simplified example.

A. Suppose a revenue class is composed exclusively of two rate classes, and at a given point in time their two trend-based gWh forecasts are identical. Using Mr. Gredder's approach, a reconciliation of their combined forecast to a lower associated revenue class forecast would

occur by applying an equal decrement to each component (to maintain consistency with having a forecast of equal shares). But this would occur even if a companion analysis showed that, historically, 99 percent of any combined error is attributable to just one of the two series; clearly, under these circumstances, applying equal decrements would be contrary to common sense. As I mentioned earlier, the desired companion analysis is absent from the Company's case. Therefore, I am concerned the forecast allocation factors have not been sufficiently validated.

Q. And what is your second concern?

A. My second concern is there is nothing that indicates Mr. Gredder's "indirect" approach should be expected to generate rate class forecasts that are more accurate than ones produced directly – that is, from their own specific equations – as is typically done. His initial testimony is, understandably, silent on the issue; as he indicated in his response to interrogatory DPS-244(GPS-8), no such

comparative evaluation was ever done. To me, all that is evident is an added level of complexity, as the rate classes themselves do not map exclusively into a single revenue class.

Q. What approach did you use instead?

A. My approach was to forecast the rate classes directly, as was done by both the Company and by Staff in Case 10-E-0050, and a majority of my forecasting equations represent updates to those I testified to in that case.

Q. Are there other key differences in the two forecasting approaches?

A. Yes, there are. Most importantly, the Company's specific service class customer and sales projections are independent of each other. This is in direct contrast to my approach, which uses a number of explicit linkages among the equations.

Q. Please give details of what you mean by linkages.

A. Sales forecasts are aggregates across subsets of

individual customers. The simplest linkage is to derive these aggregates as the product of customer count and sales-per-customer forecasts. Additional linkages could include the use of one customer class count to help forecast another, or the use of (own) customer counts as a forecast driver within a sales forecasting equation. Collectively, my set of equations contains all of these elements.

Q. When an equation forecasts sales per customer, doesn't the inclusion of customer counts as a forecast driver lead to an overstatement of the impact of customers on total sales?

A. It depends upon the equation's specific functional form. Any equation that uses the number of customers to help explain the level of sales per customer is obviously linking total sales to the number of customers squared. But when the logarithm of the customer count is used to help explain the logarithm of sales per customer (as I do), there is no overstatement – the level of sales remains linked to the "raw" customer count. Moreover, in this instance, the

customer count variable captures a very specific trait in the historical data: an incremental customer's usage differing from the average existing customer's usage, all else equal. Simply put, the regression coefficient captures how a one percent change in the number of customers impacted *on its own* overall average sales per customer. That is distinct from the direct impact of new customers on total sales (the multiplication of sales per customer by an incremental number of customers).

Q. And this effect is assumed to continue forward with customers added in the forecast period?

A. Yes, it is.

Q. Is there a more generic advantage to linkages being present?

A. Yes, there is. The presence of these linkages helps to generate forecasts which are consistent with each other, which would not necessarily occur otherwise.

Q. But given that you are primarily focused on rate

classes that are revenue decoupled, isn't the matter of forecast consistency a moot point?

A. I don't believe so. It is certainly true that revenue decoupling minimizes aggregate revenue risk for both the Company and its ratepayers. However, this ultimate reduction in risk comes at the expense of adding potential volatility to per-kWh prices paid by individual customers, in the form of a random (from the viewpoint of an individual customer) additional charge/credit – namely, an RDM adjustment. Logically, the goal is to have any such adjustment be minimal, and having consistency among forecasts is an important step toward its achievement.

Q. What other key difference distinguishes your forecasting equations from those of Mr. Gredder?

A. With the exception of the equation for Street Lighting sales, all of my other sales-related equations make use of a time-varying intercept term.

Q. What is the purpose of using a time-varying intercept?

A. It explicitly allows for factors that are not part of the equation, such as impacts of Energy Efficiency, to have a cumulative effect over the historical time period.

Q. Please explain in more detail.

A. As noted at page 21 of Mr. Gredder's initial testimony, Energy Efficiency "[s]avings prior to 2012 are embedded in the historical data …." And since these savings are not constant over time, if simply ignored their impact could lead to biased estimation results. By allowing an intercept to vary over time, these differing levels of savings can be easily captured within a given regression equation.

Q. Did your regression results reveal statistically significant levels of Energy Efficiency savings?

A. The results revealed intercepts generally lower in 2011 than in 2009 – or, more precisely, the hypothesis of an unchanging intercept over an entire 2004-2011 estimation period being consistently rejected – which is what was expected *a priori*. However, this effect

technically cannot be tied solely to Energy Efficiency impacts. The estimation technique captures the net impact of *all* unspecified factors, which in these instances include both Energy Efficiency and electric price.

Q. Have you illustrated the estimated intercepts' respective time paths in an exhibit?

A. Yes, I have; graphs showing the estimated intercepts' time paths accompany the associated regression-specific results within Exhibit__(GPS-2).

Q. Are there any other features contained in your regression equations on which you wish to elaborate?

A. Yes, there are. In three of the sales-per-customer equations, the value of a particular coefficient was imposed, rather than estimated. In the equation for SC 3 sales, the coefficient on SC 3 customers was imposed. In the equation for SC 1 sales, the coefficient on per-capita income was imposed. And in the equation for SC 3A sales, the output elasticity – that is, the

coefficient on real GDP – was imposed.

Q. What was the reason for imposing a coefficient value in the SC 3 sales equation?

A. When left unconstrained, the original coefficient estimate (-1.25) implies an impossible result. Because of the equation's particular functional form, this coefficient is equal to the ratio of marginal sales per customer to average sales per customer, minus one. A coefficient less than -1.00 means that the ratio itself is negative, implying that all other things equal, a typical new customer's usage would be negative. Therefore, an acceptable value equal to the analogous coefficient in the SC 2 Demand equation (approximately -0.78) was imposed.

Q. How significant of a constraint is this?

A. In a statistical sense, not very; the constrained value is less than one standard deviation (±0.50) from its original (-1.25) estimate. Thus, a test for a significant difference between the two values at the

traditional five percent level (approximately two standard deviations) would be rejected.

Q. What was the reason for imposing a coefficient value in the SC 1 sales equation?

A. Despite using the same constant elasticity specification that was used by Staff in Case 10-E-0050, the (unconstrained) estimated income elasticity dropped sharply, from 0.28 to virtually zero (a statistically insignificant 0.03). However, a zero value is inconsistent with results typically found in economic literature, as well as the estimate of approximately 0.16 (at variable means) that is embedded within the Company's own (total) Residential Energy equation in Exhibit__(JFG-16). Based on these other findings, I imposed a value of 0.20.

Q. What was the reason for imposing a coefficient value in the SC 3A sales equation?

A. Similar to the result for SC 1, the original unconstrained coefficient was insignificantly different from zero. But it is illogical to

believe the GDP coefficient is truly zero; a zero coefficient would imply that additional service-area output could be produced with no contribution from these large customers, or that they could produce that additional output without using additional electricity. Therefore, in my equation I have retained real GDP as a forecast driver, with the coefficient set at 0.178 (the corresponding Staff coefficient estimate in Case 10-E-0050).

Q. Turning to Exhibit__(GPS-1), please provide a brief comparison of your forecasts against Mr. Gredder's, beginning with the customer forecasts.

A. For the customer forecasts, differences lie inside of a one percent band (plus or minus) – with street lighting (-2.5) being the lone exception. The SC 2 Non-Demand forecast has the next largest negative percentage difference (-0.8), although my forecast for SC 2 Demand customers is higher.

Q. Are your sales forecasts similarly close?

A. No, they are not. While my sales forecasts for classes SC 1 and SC 2 Non-Demand are reasonably close to his (0.4% and 0.6% higher, respectively), my forecasts for SC 2 Demand, SC 3, SC 3A, and Street Lighting are each noticeably – approximately two percent – lower (-1.9%, -2.1%, -2.3%, and -2.0%, respectively). Overall, my combined forecast for these six classes is below Mr. Gredder's by approximately one percent.

Q. Are these differences mainly the result of higher sales per customer forecasts?

A. That is correct; for all but class SC 2 Demand, my corresponding sales per customer forecast is higher.

Q. Do any forecast discrepancies result from differing assumptions about incremental Energy Efficiency reductions?

A. No, they do not. In aggregate, I used the same estimated total future gWh savings figures used by Mr. Gredder. A very small difference on a per-customer basis exists to the extent customer

forecasts differ between us.

Q. Why keep the aggregate number - do these projected savings tie into any other cases?

A. Yes, they do. As noted at page 21 of Mr. Gredder's initial testimony, they are "targets for the portfolio of Company-administered electric EEPS programs …" that were first set forth in Case 07-M-0548. And as noted in Exhibit MAP-1CU of the Management Audit Panel, recommendation V-2, the Company is currently undertaking actions intended to improve the quality and evaluation accuracy of its Energy Efficiency programs.

Q. Do forecast discrepancies instead result from a key factor – such as the effect of the economy – being unaccounted for?

A. No, I don't believe so. Both Mr. Gredder and I make use of multiple forecast drivers that represent the level of economic activity: income, employment, real output.

Q. Is there a simple explanation for the

discrepancies in the forecasts?

A. For some classes, yes. The two Street Lighting sales forecasts are similar on a per customer basis; the main source of the disparity in projected total sales is the different downward trends expected for the number of Street Lighting customers. For SC 1, the opposite is true: the two forecasts of the number of customers are very close, but given the higher responsiveness to income growth in my sales equation, I have higher projected sales per customer. For the other classes, there is no consistent pattern of differences, and the explanation lies in the different forecasting methods themselves, not a single trend or elasticity.

Q. Do you believe your customer and sales forecasts should be updated if/when an updated economic forecast is procured from Economy.com?

A. Yes, I do. In Mr. Gredder's own words, "… the economic indicators for employment, gross product and real income show strong growth cycles during [Fiscal Years] 2013 through 2016."

My forecasts, as well as Mr. Gredder's, are conditional on these expectations; should these expectations change, the forecasts should change as well.

Q. What, therefore, is your recommendation to the Commission?

A. With the economic conditions indicated in Mr. Gredder's Exhibit__(JFG-3) taken as a given for the Rate Year, I recommend that the Commission adopt my present rate class forecasts for SC 1, SC 2 Non-Demand, SC 2 Demand, SC 3, SC 3A, and Street Lighting because of the concerns associated with Mr. Gredder's forecasting method that I explained earlier.

Q. Does this conclude your testimony at this time?

A. Yes, it does.