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Three Empire State Plaza, Albany, NY 12223-1350
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September 21, 2017

(Via Email to Secretary@dps.ny.gov)
Honorable Kathleen Burgess
Secretary to the Commission
New York State Public Service Commission
Three Empire State Plaza
Albany, NY 12223-1350

Re: 17-01277 – In the Matter of the Value of Distributed Energy Resources Working Group Regarding Rate Design.

Dear Secretary Burgess:

Please find attached "Staff Mass Market Bill Impacts Study Draft" for posting in the referenced matter. Comments are due from the working group participants no later than September 27, 2017 and the final will be filed with the Commission by October 1, 2017.

Sincerely,

/s/

John Garvey
Utility Supervisor
Department of Public Service
Three Empire State Plaza
Albany, NY 12223-1350

Encl.

STATE OF NEW YORK
DEPARTMENT OF PUBLIC SERVICE

CASE 16-M-0430 - In the Matter of Rate Design Reforms Supporting the Commission's Reforming the Energy Vision.

CASE 14-M-0101 - Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision.

CASE 15-E-0751 - In the Matter of the Value of Distributed Energy Resources.

MATTER 17-01277- In the Matter of the Value of Distributed Energy Resources Working Group Regarding Rate Design.

Staff Scope of Study to Examine Bill Impacts of a Range of Mass Market Rate Reform Scenarios

(October XX, 2017)

TABLE OF CONTENTS

INTRODUCTION AND BACKGROUND

On May 19, 2016, the Public Service Commission (Commission) issued an Order Adopting a Ratemaking and Utility Revenue Model Policy Framework in Case 14-M-0101 (Track Two Order). The Track Two Order identified several rate design issues to be considered for future action. By the Track Two Order, the Department of Public Service staff (Staff) was required to work with stakeholders and report to the Commission by October 1, 2017, regarding the scope, feasibility and deliverables of an analytic approach to examining bill impacts of a range of opt-out variable rate scenarios (e.g., time-of-use rates, demand charges, and peak-coincident demand charges) for various non-demand commercial and residential classes of customers.

Specifically, the Commission directed Staff to consult with stakeholders to define the scope of a study that would analyze the potential impacts of a variety of mass-market rate reform scenarios for delivery and/or default commodity service. The Commission noted that the analysis of these rate design changes, however, must include a substantial focus on impacts on customers that do not participate in distributed energy resources (DER). In addition, the Commission noted that the study should be designed to model impacts using New York-specific data, but should consider experience from other jurisdictions.

The Track Two Order explains that the policy framework guiding this effort should consider:

- Integrating REV objectives with rate design principles, such that a time-variable rate should support customer response as well as representing efficient cost recovery;

- Potential consequences for customers participating in DER (both "active" and "prosumer" as defined in the Track Two Order), non-participants ("traditional" customers), low-income customers, and utility financial risk as it relates to cost recovery; and
- Prerequisites to implementation, e.g. advanced metering, valuation of DER, outreach and education, and enabling technologies.

The Commission also noted in the Track Two Order that within the general category of time-variable rates structures, design choices can have a large impact on both the achievement of REV objectives and on the bill impacts for customers at all levels of participation. For that reason, the scoping effort should consider a range of determinant factors that may contribute to the overall value of a study. These may include:

- Type of costs recovered within rate elements or time periods;
- Ratio of peak to off-peak prices;
- Duration of peak or demand intervals;
- Number of peak periods included;
- Seasonal differentials; and
- Implementation factors, including types of pricing signals, enrollment mechanism, and enabling technologies

Since many of the rate design issues addressed in the Track Two Order also relate to the efforts of Staff and stakeholders in the Value of DER (VDER) Proceeding,[1] the

[1] Case 15-E-0751, In the Matter of the Value of Distributed Energy Resources.

Commission issued a Notice of Rate Design Issues to be Addressed in VDER Proceeding. One of those issues the Commission identified that would be addressed in the VDER Proceeding through the Rate Design Working Group, is the bill impact report to be filed by Staff. Staff's VDER Rate Design Working Group has included a series of in-person meetings and written comments to develop ideas and solicit feedback which Staff has reflected in this report.

While the scope of the study was initially intended to include only opt-out mass market rate design modifications, Staff proposes that the initial phase of the study begin by examining bill impacts associated with the VDER Phase Two rates that would be developed to replace Phase One NEM, as discussed in the Commission's March 9, 2017 Order on Net Energy Metering Transition, Phase One of the Value of Distributed Energy Resources and Related Matters (VDER Phase One Order).

In the VDER Phase One Order, the Commission stated that Phase One NEM will be available to all mass market on-site projects. Phase One NEM is available to projects that are: (1) interconnected behind the meter of a customer within a utility's residential or small commercial service class; (2) not billed based on peak demand; (3) not used to offset consumption at any other site; and (4) interconnected before the earlier of January 1, 2020 or a Commission order directing modification. Therefore, to allow enough time for implementation of new rate designs prior to the expiration of the Phase One NEM option, the Commission concluded that a Phase Two rate design can and should be presented to the Commission for consideration by or before December 31, 2018. Such rate design will be developed through the VDER working group process, and the bill impact analysis of that proposal will be a critical component of the Staff filing to the Commission.

PURPOSE OF BILL IMPACT STUDY

The bill impact study will provide valuable information for the Commission to evaluate mass market rate design changes, on both a generic and utility specific basis. The bill impact(s) can help inform the Commission regarding the pace of implementation and the specific rate design modifications. Since the Track II Order does not require the application of a specific rate design, the Staff proposal includes a two-step approach. The first step is the development of the rate design(s) for VDER Phase Two rates. Upon completing the first step of determining the VDER Phase Two rates, a subsequent step will examine opt-out rate designs that would be applicable to all mass market customers.

Staff notes that there are several on-going initiatives that will inform the rate designs selected for these studies of bill impacts. These include rate pilots in areas with AMI, existing TOU rates, Smart Home Rate demonstration projects and the NGRID Clifton Park demonstration project. Once the rate designs are determined, the bill impact study can be performed as described below.

RATE DESIGN DEVELOPMENT

Before conducting a bill impact study, the rate designs to study and the definition of the typical customers need to be determined. Utilities can begin developing analytical tools to perform the bill impact study concurrent with development of the threshold constraints of rate designs to be tested and the definition of typical customers to study.

There are many important issues that need to go into determining which rate designs are included in the bill impact study for each utility, including, in part:

- What metering technology exists or is likely to exist at each utility;
- Whether one set of tariffs is sufficient to promote efficient use of the grid by both prosumers and consumers;
- How to apply the information of the value stack to rates;
- Experience from New York and out-of-state utilities.

The specific steps necessary to develop rate designs are as follows:

Develop Rate Structure

For both distribution and energy supply, determine the appropriate rate structure (e.g., fixed charge, demand), time periods if applicable, and method of demand measurement if applicable.

Calculate Billing Determinants

Once the rate structure is established, using interval data available for the utility's load research sample, the billing determinants (e.g., number of billed kWh or kW by time period) for customers in the sample are quantified. This result is then extrapolated to the class population to create the billing determinants necessary for rate design.

Calculate Revenue-Neutral Rates

Using the billing determinants and other rate design parameters (e.g., peak to off-peak differentials, summer to winter differentials, costs to be recovered through each rate

component) the rates can be calculated for each rate design to be considered.

RATE DESIGN STRUCTURES TO BE CONSIDERED

Many possible rate design options are available for consideration. Principles should be applied to identify a limited number of the most promising rate design options for distribution and energy supply. The principles should be those adopted by the Commission in the Track Two Order as stated below:

Cost causation: Rates should reflect cost causation, including embedded costs as well as long-run marginal and future costs. Fixed charges should only be used to recover costs that do not vary with demand or energy usage.

Encourage outcomes: Rates should encourage desired market and policy outcomes including energy efficiency and peak load reduction, improved grid resilience and flexibility, and reduced environmental impacts in a technology neutral manner.

Policy transparency: Incentives should be explicit and transparent, and should support state policy goals.

Decision-making: Rates should encourage economically efficient and market-enabled decision-making, for both operations and new investments, in a technology neutral manner.

Fair value: Customers should pay the utility fair value for services provided by grid connection, and the utility should pay customers fair value for services provided by the customer.

Customer-orientation: The customer experience should be practical, understandable, and promote customer choice.

Stability: Customer bills should be relatively stable even if underlying rates include dynamic and sophisticated price signals.

Access: Customers with low and moderate incomes or who may be vulnerable to losing service for other reasons should have access to energy efficiency and other mechanisms that ensure they have electricity at an affordable cost

Gradualism: Changes to rate design formulas and rate design calibrations should not cause large abrupt increases in customer bills or delivery rate impacts

Economic sustainability: Rate design should reflect a long-term approach to price signals and the ability to build markets independent of any particular technology or investment cycle.

Examples of possible rate design approaches to be considered are:

- Time-of-Use (TOU)
- Demand Charges (non-coincident and coincident peak)
- Grid Access Charges
- Fixed Subscription Fees
- Minimum Bills
- Critical Peak Pricing
- Seasonal / Tiered Pricing
- Reduced Customer Charges
- Commodity vs. Delivery / overlapping price signals
- VDER Stack – Prosumer Rate Option
- Market Based – Energy and Capacity Supply

The categories of costs (i.e. customer, distribution, transmission, and generation) to include in each rate component, as well as the percentage of each type of cost to recover, must be justified and supported by data. TOU periods should also be established to reflect actual system usage. Statistical analyses should be considered to determine the months and hours in which the system is most likely to peak to define hours for collecting generation and transmission costs.

DATA NEEDED FOR RATE DESIGN DEVELOPMENT

[INSERT an accounting of the utilities' current data necessary to develop alternative rate designs]

Ideally, the bill impact study would be done with several years of individual customer data from AMI meters that would enable robust customer segment analyses, calculation of the frequency distribution of impacts, and many sensitivity analyses. This data will not be available for several years. New York utilities have representative or surrogate sample interval data for mass market customers within the appropriate classes. Analyses of this data can be extrapolated to a class population in a manner that produces statistically significant results.

To ensure a robust discussion, subject to appropriate considerations for privacy and confidentiality, stakeholders must be provided as much anonymized raw data as possible to perform their own analyses. In addition to the utility specific interval data available for the sample set of mass market customers, data from AMI Pilots, Demo Projects – NYSEG / NGRID, Existing TOU rate customers, and other states / programs can be used in the study.

BILL IMPACT STUDY

For the bill impact study to produce meaningful results that provide the Commission with reliable information, the bill impact study should be clearly defined and replicable by Staff and stakeholders. There also needs to be consistency in the approaches used by each utility, while acknowledging that basic differences exist among the utilities' data availability, metering, etc. Therefore, the Commission should require that

all underlying data sources are provided in an easily used electronic format, and that all assumptions are carefully documented along with supporting documents.

Utilities in New York have a wide variety of geographies, system designs, customer types, and weather, all of which affect revenue requirements, cost allocation, and rate design. Therefore, it is necessary to define the typical customer for purposes of the bill impact study, and to provide consistency amongst utilities for that purpose. As such, all bill impact studies should be performed on a utility specific basis, using statistically valid samples. For each of the various sub-types of residential and small non-demand billed commercial customers the impacts should be studied based on building stock (such as rural, urban, apartment, detached single-family, fossil heating, etc.) In addition to the housing stock characteristics, demographic information – such as socioeconomic data – should be included so that rate design impacts can be analyzed across customer income segments.

While each utility knows the usage level of customers participating in low-income programs and their distribution within applicable service classes, utility load research samples are not designed to produce statistically significant results that would support inferences for low-income customers or any other customer demographic group. Key demographics may include income, renters that pay for electricity, and homeowners. This type of information would need to be extracted from load research data, census data, utility specific studies, and studies at other utilities.

The specific steps necessary to perform the bill impact study are as follows:

Calculate Customer Structural Bill Impacts

The customer structural bill impacts can be described as the effect on electric bills without any change in customer behavior, assuming T&D revenue neutrality from the utilities' perspective. This is a straightforward exercise, similar to what is done in a rate case where the utility estimates, by class of customer, the effect of a particular set of rates, usually without any assumptions about change in customer behavior (e.g., price elasticity). The rate change needs to produce the allowed T&D revenue requirement based upon bill frequency data. Using the interval data available for the utility's load research sample, customer structural bill impacts (assuming no behavioral changes or technology adoption) should be determined for each customer in the sample. Results should be extrapolated to the class population and a range of specific customer types.

Bill Impact Sensitivity Analysis

As we do not know with certainty many of the assumptions to be included in a bill impact study, some level of sensitivity analysis should be considered. The sensitivities should be focused on instances where a change in the assumption could lead to a material change in the bill impact study. Sensitivity analyses should be performed by varying the rate structure and by varying customer usage to reflect behavioral effects or technology adoption. Sensitivity analyses of the rate structure may require adjusting the rate design parameters. Sensitivity analyses of behavioral effects or technology adoption should not require that the rate design process be repeated. Key assumptions must be made about price elasticity and expected penetration and adoption rates as well as assumptions for opt-in and opt-out.

Because AMI is not currently widely deployed, data that would enable the analysis of the distribution of impacts based on actual customer usage is not readily available. To replace this, robust sensitivity analyses must be included with any data based on utility load studies or pilot program results. These analyses should look at varying the types of technology installed (i.e. with or without air conditioning, electric heat vs. fossil heat) and load patterns (consumers with relatively high or relatively low usage, those that are away during the day vs those in their house). While not every potential customer combination can be modeled, a wide set of prototypical customers must be developed to understand any trends in the bill impact and how to mitigate undesirable outcomes.

The sensitivity analysis should be performed for two levels of application, including: (1) short term effects that change with little to no capital investment; and (2) longer term effects that require significant capital investment by either the utility, a consumer, or a prosumer. Both levels should be considered in a bill impact study since looking at any one without the others might provide a skewed view of how the new rate designs might affect behavior and the utility system.

Short-term impacts look at what shifts in behavior might occur with little or no capital investment by the consumer, typically impacted by customer education, utility supported programs (e.g., efficient appliance subsidies, removal of old refrigerators, thermostat swaps, optional rate designs that require direct utility control of appliance's such as water heaters or air conditioners), third party solar installations and short-term price elasticity. This stage of the analysis requires assumptions of customer behavior based upon studies (wherever they may have been performed) that indicate customer adoption rates, appliance penetration rates and short-term price

elasticity. The use of publicly-available reports and information drawn at least in part from other sources, such as consultants and stakeholders, should be used to assess the behavioral impacts of rate design changes on customer bills.

The inclusion of behavioral impacts is important to ensure that mass-market customers can understand and will respond in a rational manner to changes in rate design. This may include an evidence-based evaluation of what customers understand, what they are willing to accept, and what actions they are willing to take. Typical usage data and load curves for end-use appliances have been develop and can often be found through the National Laboratories and Electric Power Research Institute.

Longer-term impacts include changes in customer behavior that require capital investments. It is substantially similar to the short-term analysis, other than the cost of the capital improvement must also be considered. The bill impact study should consider investments such as onsite generation, storage or building energy management systems. The longer-term should see additional customer behavioral changes as enabled by capital investments. This sensitivity could also consider the avoided utility capital costs that changes in consumer and prosumer behavior would enable.

DATA NEEDED FOR BILL IMPACT STUDY

[INSERT an accounting of the utilities' data necessary to perform bill impact studies]