

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.

**Department of Public Service Staff
Guiding Instructions to Utilities and Stakeholders on
the Approach/Implementation of Mass Market Rate Reform
and Bill Impact Analysis**

VDER Rate Design Working Group

(January 30, 2018)

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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, 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 must include a substantial focus on impacts on customers that do not participate in distributed energy resource (DER) programs or markets. 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:

- Integration of REV objectives with rate design principles, such that a time-variable rate can 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 determinants 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

The initial phase of the study will begin by examining bill impacts associated with the VDER Phase Two rates, also referred to as mass market NEM successor tariffs, 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 non-demand commercial service classes; (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. To allow enough time for the implementation of new rate designs prior to the expiration of Phase One NEM, the Commission recommended that a Phase Two rate design be presented to the Commission for consideration by December 31, 2018. Such rate design will be developed through the VDER working group process, with the bill impact analysis of that proposal forming a critical component of the Staff filing to the Commission. In addition to the bill impact studies, there are two additional impact studies that will be performed on the proposed VDER Phase Two rates. The first is the calculation of the impact of the VDER Phase Two rates on non-participants as measured by the change in costs that would be shifted to non-participants as a result of the new rates. This study will be performed by a consultant with input and guidance from Staff informed by the working group. The second is the calculation of the impact of the VDER Phase Two rates as compared to existing Phase One NEM, on new mass market customers that install rooftop solar on a use case basis. This study should consider various use cases and determine the impact of the proposed rates on the project economics and on achieving New York's clean energy goals. The use cases should be developed using utility-specific typical rooftop solar installation data. This study will be performed by a consultant

with input and guidance from Staff informed by the working group.

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 Two Order does not require the application of a specific rate design, a two-step approach will be used. 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 be established to examine opt-out rate designs that would be applicable to all mass market customers. It is expected that that the work completed for the VDER Phase Two rates will form the foundation for the mass market default rate design, including the possibility that the VDER Phase Two rates be offered as an optional rate to any mass-market customer as an interim step to full mass market rate design reform.

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 shall 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(s) 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;
- Whether aspects of the information reflected in Value Stack elements could be applied to rates; and
- 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, the billing determinants (e.g., number of billed kWh or kW by time period) for customers in the sample are quantified using interval data available from the utility's load research sample. 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 or Increased 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, the percentage of each type of cost to recover, and TOU periods must be justified and supported by data. As the list demonstrates, there are many potential rate design options to consider. Thus, to move forward expeditiously, a reasonable approach is to select several of the most promising options from the list above for initial study.

DATA NEEDED FOR RATE DESIGN DEVELOPMENT

Ideally, the rate design development and bill impact study would be performed using several years of individual customer data from AMI meters, if installed, 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 for those utilities pursuing AMI. New York utilities have representative or surrogate sample interval data for mass market customers within the appropriate classes. This data is obtained and updated periodically through in-house load research programs at

Consolidated Edison Company of New York, Inc., Orange and Rockland Utilities, Inc. and Central Hudson Gas & Electric and from a third party such as Itron, Inc. at New York State Electric & Gas Corporation and Rochester Gas and Electric Corporation. This data could be used to inform bill impact studies by extrapolation to a class population in a manner that produces statistically significant results. Any utility data used for bill impact analyses shall be made available to stakeholders and be provided alongside the necessary context (e.g., how the data was collected, additional relevant customer data). In addition to load research data, rate design development can require system load data. Each New York State utility has system load data available as described in the Distributed System Implementation plans filed on June 30, 2016 in Case 14-M-0101.

UTILITY BILL IMPACT STUDIES

In order for the bill impact studies to produce meaningful results that will 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, all underlying data sources shall be provided in an easily used electronic format with all assumptions carefully documented along with supporting documents as necessary, in order to assess the results of the utility -provided models.

Utilities in New York serve a wide variety of geographies, with unique system designs, customer types, and weather, all of which affect revenue requirements, cost allocation, and rate design. Therefore, it is necessary to

define utility-specific typical customers for purposes of the bill impact studies, in a manner consistent amongst utilities. In addition to typical customers, bill impacts for low income customers should be determined as well. 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 available to produce statistically significant findings for low-income customers or any other customer demographic group. The VDER working group will discuss and address how best to approach this aspect of the analysis.

The customer bill impact analysis and the process used to conduct the analysis must be transparent, efficient, and supportive of Commission decision-making. Joint Utilities will provide their bill impact models to stakeholders. The process will initially focus stakeholders' efforts on providing input into and review of the Joint Utilities' modeling approaches and data. This process will avoid the potential for multiple stakeholders developing parallel bill impact models and analyses that would be difficult to reconcile. Regularly scheduled VDER Rate Design Working Group meetings will provide the forum that will foster consistency among the utilities and provide stakeholders and the Commission with transparent and reliable information.

The specific steps necessary to perform the utility bill impact study, after revenue neutral rates have been developed, are as follows:

Calculate Customer Bill Impacts

The customer 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 analysis 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 must produce the allowed class specific T&D revenue requirement based on forecasted billing determinants. Using the interval data available for the utility's load research sample, customer 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.

Bill Impact Sensitivity Analysis

The sensitivity analysis should be focused on instances where a change in an assumption could lead to a material change in the bill impact study. Sensitivity analyses should be performed by varying the customer usage levels and patterns to reflect behavioral effects or technology adoption. Key assumptions must be made about price elasticity and expected penetration and adoption rates as well as assumptions for opt-in and opt-out, and energy usage information obtained from AMI data or other data sources. Behavioral and related information should support the assumptions and should be drawn from outside sources, consultants, and results from New York demonstration projects and pilots as they become available. The Joint Utilities' models should be structured to perform a top-down analysis in a manner that enables stakeholders to make varying assumptions about customer responses to specific rate designs.

The sensitivity analysis should be performed to examine short term effects that change with little to no capital investment. Longer term effects that require significant capital investment by a consumer, a prosumer, or that impact utility capital investment programs will not be examined at this time.

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), 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 developed and can often be found through the National Laboratories and Electric Power Research Institute.

DATA NEEDED FOR BILL IMPACT STUDIES

The bill impact study will consider a variety of possible rate design approaches, each varying with likely customer responses. Data and related information that is required to effectively assess each of the options noted include:

- Detailed assessments of the price elasticity of demand by customer segment - As noted previously, information regarding customer response to varying rate designs will be provided from outside sources including consultants. Price elasticities will be used to approximate customer responsiveness to rate designs that include a dynamic price (e.g., time varying rates such as time-of-use, critical peak pricing, and market-based energy and capacity supply rate programs) and demand charges, which are intended to shift consumption from system peak periods.
- Customer load profiles - Detailed load profiles indicate the volume of customer energy or demand that is potentially available to respond to the studied rate designs.
- Customer demographics - The Joint Utilities have varying amounts of customer demographic data at their disposal. The Utilities' load research data has not historically been obtained for varying demographic subsets. As a result, it is not possible to draw meaningful demographic conclusions for rate design options that are dependent on load interval data. In such situations, other yet to be determined methods would be required to fill the disconnect between demographics and load interval data. This type of information would need to be extracted from census data, utility specific studies, and studies at other utilities.
- DER Profiles used to predict variations in consumer behavior due to DER participation - A customer bill impact study can look at prototypical customers with select types of DER, if reliable hourly generation and/or load data are available for technologies such as distributed solar, electric vehicle charging, and electric heat pumps. DER Profiles will not be informed by only historical usage

patterns, as historic usage patterns were experienced under the current rate designs, and will likely vary from future usage patterns. Thus, a stakeholder and or consultant engagement process will inform the development of realistic proxy profiles for how DERs may likely operate in the future under the proposed rate design.