November 6, 2014

By Email for Electronic Filing
Hon. Kathleen H. Burgess
New York Public Service Commission
Three Empire State Plaza
Albany, New York 12223-1350

RE: Time Sensitive Rate Pilot Plan, Case 13-E-0030

Dear Secretary Burgess:

We are strong advocates for a time-sensitive rate pilot as a first step towards wider implementation of time-sensitive rates in the service territory of Consolidated Edison Company of New York, Inc. ("Con Edison" or the "Company"). In our view, time-sensitive rates coupled with tools and technologies can play a critical role in advancing the Reforming Energy Vision ("REV") agenda by helping customers manage load and shift consumption away from peak demand, thereby reducing wasteful infrastructure capacity investments and purchases of costly energy.

Overview Comments

We applaud Con Edison's efforts to assure rigor in the design of the pilot, including the proposal for multiple treatment groups in addition to the control group and the use of meters that have 15-minute time-of-use measurement capability. While Con Edison describes the summer peak in the relevant networks as lasting six hours from 6 pm to midnight, we are pleased that Con Edison adopted our idea that the period when rates would be at the highest level for any one participant would last three rather than the full six hours. Structured this way, half of the participants would sign up for a peak period in the earlier 6 to 9 pm slot, and the other half in the 9 pm to midnight slot. However, we have serious reservations about some of the proposed pilot's features, which

we have discussed with the Company. Some features of the proposed plan are antithetical to features of other pilots deemed successful. Without some material modification to those features, our enthusiasm for proceeding with this pilot is greatly diminished.

For EDF, it is vitally important that this pilot be successful. Success should be defined as attracting participants to the pilot and demonstrating how time-sensitive rates, coupled with effective demand management information, tools and technologies, can benefit customers – particularly by saving them money. The greater the number of participants who are better off economically than they would be otherwise, the greater the success of the pilot. Thus, while Con Edison has stated that the pilot's objective is to test the price-responsiveness of downstate residential electric customers in the context of price and service offerings, this should be done in such a way that encourages and allows all participants to spend less money on their power consumption than they otherwise would, without imposing undue inconvenience. Indeed, if all participants saved money by shifting load away from the peak and interim peak to the off-peak periods, all of Con Edison's customers could benefit since their total purchases of the most expensive power would be correspondingly diminished. Over the longer term, time-sensitive pricing, when scaled up, could result in savings for all ratepayers by helping to avoid expensive investments in infrastructure capacity expansions that serve demand for only a limited number of hours per year, e.g., 40-48 hours per day as described in Con Edison's Brooklyn Queens Demand Management ("BQDM") Program Petition or the top 100 hours per year per as described in the Staff Straw Proposal on Track 1 Issues in the REV proceeding.

On the other hand, if the pilot is designed such that there is a high potential that some or many of the participants would experience higher electricity bills than they would have by not participating, that experience will likely sour those participants on the whole concept of time-sensitive rates. Additionally, if it is not clear to potential participants that they could be better off economically through this program, it may be difficult for Con Edison to engage customers and persuade them to participate. Furthermore, customers' negative experience with the pilot could pose a road-block to further time-sensitive pricing deployment and scaling in New York.

We now turn to the following particular aspects of Con Edison's time-sensitive rate pilot plan (the "Proposed Pilot Plan") that warrant significant modification. They are:

- The proposed method and meaning of revenue neutrality in the context of the Proposed Pilot Plan;
- The questionable utility of the first treatment and shortcomings of the second and third treatments as proposed;
- The absence of any critical peak pricing feature in the pilot;
- The inadequacy of any outreach, education or technical assistance program for those participants who may feel that they are experiencing higher electricity bills than they would have otherwise;
- Adverse consequences of locking customers in for the full two year period;

- Shortcomings in experimental design, particularly with respect to how the control group is identified and baseline consumption is measured, resulting in a likely biased estimate of demand elasticities.

The Role of the Principle of Revenue Neutrality

EDF is concerned with the application of revenue neutrality as described on p. 2 of the Proposed Pilot Plan. The main purpose of time-sensitive rates is to save both the system and customers money by incentivizing a decrease in peak load; therefore, a well-designed rate program should, over time, save money for both Con Edison and customers, relative to the business-as-usual approach. Time-sensitive rates can generate savings to customers almost immediately by reducing demand for the most expensive energy during critical peak demand periods. In addition, they may enable future savings through the postponement or avoidance of construction of capital infrastructure (e.g., expansion of substation capacity such as in the BQDM Program) and reduced costs of maintaining infrastructure that provides capacity for critical peak demand (e.g., that infrastructure needed during the 40-48 hours of highest peak demand).

On page 2 of the Proposed Pilot Plan, the Company states that it "designed the TOU Pilot Rate on a revenue-neutral basis". This raises two questions. First, what is meant by revenue neutral? Although we understand that revenue neutrality has been a design consideration in leading time-sensitive price pilots and deployments nationwide, it appears that the principle is being invoked in a different and more punitive manner here than in those cases.

In leading time-sensitive pricing pilots and deployments, the revenue neutrality principle is described as resulting in the same revenue to the utility under both the pilot and non-pilot rates given no change in the current load shape of the residential customer class (e.g., Sacramento Municipal Utility District's SmartPricing Options Pilot[1], Baltimore Gas & Electric Company's Smart Energy Pricing[2], the California Statewide Pricing Pilot[3], and PowerCentsDC Pricing Pilot[4]). By contrast, certain statements in the Proposed Pilot Plan – notably the statement on page 5 that "the Company estimates that a customer using electricity service based on 300 to 450 kWh per month would need to shift approximately 8 to 31 percent of his or her summer usage from the peak hours to the off-peak hours to break even" – give us the distinct impression that, in this case, the Company has designed the rate so that total revenues from all of the participating customers would only remain neutral if participants are able to significantly shift their consumption. In other words, the rate appears to have been designed so that inaction, or minimal

[1] Jimenez, L.R. et.al. (2013). "SmartPricing Options Interim Evaluation: An interim evaluation of the pilot design, implementation, and evaluation of the Sacramento Municipal Utility District's Consumer Behavior Study", U.S. Department of Energy/Lawrence Berkeley National Laboratory, page 51.
[2] Faruqui, A. and S. Sergici (2009). "BGE's Smart Energy Pricing Pilot Summer 2008 Impact Evaluation". The Brattle Group, page 1.
[3] Charles River Associates (2005). "Impact Evaluation of the California Statewide Pricing Pilot", page 18.
[4] eMeter Strategic Consulting (2010). "PowerCentsDC Program Final Report", page 4.

action, will necessarily give rise to a bill increase, with modest modifications allowing participants to return to bills equivalent to their flat rates, and significant modifications being needed for them to realize savings.

Second, is the entire rate designed on a revenue-neutral basis – including the energy portion of the rate? The context of the statement about revenue neutrality, in the overview at the top of page 2, suggests that it is meant to apply to the entire rate, not merely the Delivery Charges and Capacity components, which are described under subsections that follow. Since the Company does not have sunk costs to recover in the case of Energy, revenue-neutrality, if it is applicable at all, should have no relevance to how Energy prices are set for customers in a time-sensitive pricing pilot. Further clarification on this matter would be helpful.

We understand the need to maintain revenue overall so that Con Edison can meet its capital and operating costs in accordance with the February 2014 rate order. However, given the very small size of this pilot (and the potential for savings that could accrue to both Con Edison and participating customers if more sophisticated pricing is deployed more broadly in the future) the principle of revenue neutrality, if applicable, should be applied in a manner consistent with pilots in other service territories, and that results in a rate structure that affords all pilot participants who modify their energy consumption in response to new price signals an opportunity to realize savings.

Insofar as the principle of revenue neutrality as applied to the pilot means that the Company wants to derive the same level of revenues from the 1600 participants as it would without the pilot, even once changes in load shape are accounted for, then the Company has a most unfortunate propensity to design a pilot where a significant portion of the participants would pay higher electricity bills than they otherwise would, resulting in many participants being worse off economically. Such a result would be a disaster in terms of building customer receptivity to innovative rate designs. It would also signal a failure of one of the key purposes of the pilot, which should be to test customer responsiveness to well-structured price signals that offer customers an opportunity to save money. Customer responsiveness to an implausible rate structure is not a proposition worth testing. Indeed, the best outcome of the pilot would be that participants would demonstrate a willingness to respond to prices in a manner that could result in significant capacity and energy savings when scaled up, achieving enough bill savings in the process that the participants were pleased with the outcome. If the potential for reduced revenues from pilot participants means that, under the February 2014 Order, the Company is entitled to be made whole vis-à-vis revenue shortfalls as a result of changes in consumption by pilot participants, then we would support adjustments outside this pilot to accomplish this outcome.

Our concern with the principle of revenue neutrality as applied in the Proposed Pilot Plan is that an outcome where the participants in the three treatment groups may not save money runs counter to our concept of what "success" means in the context of a time-sensitive pricing pilot.

Other successful time-sensitive pricing structures have achieved energy savings overall, bill savings for most of the customers who participate, popularity among those who experience the new price structures, and, where adoption has been widespread, even provided a tool for deferring new capacity investments.[5] Other than energy savings, none of these outcomes can reasonably be expected in a pilot that is designed based on a principle that the utility must not be paid less by the pilot participants than it would otherwise have been paid by those same customers with no pilot.

Thus, the concept of revenue neutrality and the concept of success of the pilot are closely interrelated. Some, particularly those in the third treatment group, who benefit from both targeted information and technology tools, are apt to reduce usage during the peak rate period and shift power usage to the off-peak period and thus save money. On the other hand, the participants who do not have such access to useful information and tools may be worse off. That is not a good outcome. This conclusion leads to our second concern, namely, the design of the three treatment scenarios in addition to the control group.

Shortcomings with the Design of the Treatment Scenarios

The statement in the Proposed Pilot Plan at p. 5 that "a customer using electricity service based on 300 to 450 kWh per month would need to shift approximately 8 to 31 percent of his or her summer usage from the peak hours to the off-peak hours to break even (i.e., to pay the same amounts) with the delivery bill amounts under SC 1 Rate 1 on an annual basis" suggests that many or most participants could be worse off. As described above, this is not a good outcome.

Furthermore, there is an enormous difference between an 8% shift and a 31% shift. To demonstrate what these percentages mean, the Company should present a substantial number of representative scenarios (and the assumptions underlying them) that could show what a range of actions by customers would accomplish in terms of modestly to highly effective shifts in load. Information illustrating how representative customers (including customers with peaky loads and those with flatter loads) would actually experience the rate, and their options for responding to the new price signals, and the payoff available for doing so, is conspicuously absent from the Proposed Pilot Plan.

We urge the Company, Staff and other parties interested in the design of this pilot to read the paper "Household response to dynamic pricing of electricity: a survey of 15 experiments", by A. Faruqui and S. Sergici, J. Regul. Econ (2010) 38: 193-225. In this paper, Faruqui and Sergici demonstrate that, across a number of time-sensitive pricing pilots, the reduction in peak usage was an average of 4%, with a 95% confidence interval between 3 and 6%. For those customers

[5] *See* U.S. Department of Energy, Demand Response Defers Investment in New Power Plants in Oklahoma (April 2013), *available at:* https://smartgrid.gov/sites/default/files/doc/files/OGE%20CBS%20case%20study.pdf

with enabling technologies (including two-way programmable communicating thermostats and AC cycling switches), that percentage increases substantially – to between 21 and 30%.

If these kinds of peak reduction results are to be expected from Con Edison's pricing pilot, results that in our view would be part of the hallmark of a successful pilot, many participants who were making significant changes in their consumption would nonetheless probably experience an increase in their bill, as they would fall under the 31% threshold that may be necessary to *break even*. It is unclear whether the types of technology Con Edison is proposing (e.g., modlets) are as good at enabling shifting as the PCT and AC cycling switches, but perhaps they are. Even assuming they are, given that a customer needs to shift between 8 and 31% of peak demand to off-peak to avoid a likely increase in the bill, only those in the technology portion of the pilot will have any chance of seeing their bills stay the same or decrease.

Even though the fourth group has the greatest probability of seeing no bill increases, it is still unclear whether those participants (and even more so for those without technology treatment) could accomplish this change in usage without tools that would allow for a controlled shift in the use of other appliances to the off-peak eight-hour period of midnight to 8 am. Because the technology tools given to the fourth treatment group only help control A/C usage, this is even more problematic: appliances such as washing machines can be turned on automatically in the middle of the night, but there is much less need to heavily utilize A/C when the family is asleep. This emphasizes the need to utilize other types of technology and the importance of including these options as part of the treatment.

This could be accomplished by, for example, dividing the fourth group into two distinct technology groups, while eliminating the second group (i.e., the first treatment group). This would allow the Company to test differences in load shifting between participants who have just A/C-related tools, such as the modlet or NEST, and those who have other sophisticated tools to facilitate shifting the use of other appliances to the off-peak hours (such as timers). In addition, with the elimination of the no-technology group, it would become possible to devote one group to testing the usefulness of deploying, in addition to the time-sensitive price structure and load control technology, information technology capable of providing to the customers, in real time, the granular data collected by the sophisticated interval meters that Con Edison is proposing to use in the pilot (such as is made possible by an in-home display).

Substantial research has demonstrated that behavioral change is much larger when facilitated by technology. Although there may be interesting learning to be garnered from varying the technology made available to different groups, the pilot plan should address the costs of giving everybody in the pilot access to technology. This technology may even increase the adoption of rates by those who are worried they will be unable to shift enough in order to benefit from the lower rates in the non-peak periods.

Unless Con Edison has evidence to the contrary, we question the usefulness of testing the effectiveness of time-sensitive rates as proposed without targeted information and a variety of technology tools. That approach has already been tested extensively, and been found wanting, as described by Faruqui and Sergici in 2010[6] (at a time when enabling technology was less available and more costly). A relevant, modern, well-designed pilot at this time should focus on exactly *what kind of targeted information* and *what kinds of technology tools* are most effective at engaging participants and enabling them to reduce demand during the peak or critical peak periods, thereby reducing their demand during the three-hour high peak and the "interim" period.

As proposed, the pilot is designed to test propositions that do not need testing (i.e., *whether* information and technology helps), and does not go far enough to test what needs to be tested. There is no apparent benefit to including a treatment group (the first) that receives a minimal amount of information and nothing else. The data from many other pilots have already shown that such a treatment group will have little capacity to reduce peak usage. To be useful, the pilot needs to demonstrate something we don't already know: i.e., the combination of price signals and other tools that lead to a robust response in the unique context of New York City.

Thus, in this pilot, we ought to be testing *what* technology is useful since it is already established that technology *is* useful. As proposed, many participants will not have the tools to shift enough of their consumption to benefit from the program, thereby leaving them worse off. Coupled with the existing rate design and other worrisome features of the Proposed Pilot Plan, such as the proposal that volunteers should be locked into the experiment for two years, this would be disastrous for those unfortunate volunteers included in that particular treatment group: we have no reason to expect that they would have the power to achieve the peak load reductions of the magnitude that would be needed for them to save money. The inevitable finding that customers had negative experiences could have a chilling effect for pricing reform and may sour customer sentiment regarding claims of potential benefits from the larger regulatory changes anticipated through the REV proceeding. The pilot needs to be designed so every participant has the opportunity to be better off if they follow the rules of the game.

Critical Peak Pricing or Rebates

A robust demand response program that results in a significant number of customers reducing consumption during the critical network peak of 40-48 hours per year or even up to 100 hours per year is a powerful tool in advancing the goal of avoiding wasteful investments in infrastructure capacity that is only needed during these critical peak periods. Time-sensitive rates that apply during these critical peak hours, coupled with low rates during off-peak periods, could play a very useful role in encouraging participation in and compliance with the terms of a

[6] A. Faruqui and S. Sergici (2010). "Household response to dynamic pricing of electricity: a survey of 15 experiments", J. Regul. Econ, 38: 193-225.

demand response program. We have urged Con Edison to make it clear to firms responding to the BQDM RFI, and in the future any RFP, that it is open to demand response proposals that incorporate the use of time-sensitive rates in addition to other forms of incentives such as rebates. Con Edison has not yet indicated that it is prepared to do this. Because of this unwillingness to include these types of rates into the BQDM, the time-sensitive rate pilot should be expanded to test out the effectiveness of critical peak rates in facilitating the effective mobilization of peak reductions during the critical peak hours during the summer months – which are not established in advance, but as conditions warrant.

On the assumption that Con Edison does not plan to investigate the use of time-sensitive rates as part of BQDM Program demand response offerings, the absence of such rates as a component of the time-sensitive rate pilot constitutes a material defect of the pilot for the following reasons:

- The absence of critical peak pricing sets the Proposed Pilot Plan apart from many of the most successful time-sensitive rate pilots and deployments of recent years. For example: SMUD's pilot included a TOU rate, a critical peak price (CPP) rate, and a CPP rate layered on top of a TOU rate[7]; BGE's pilot included a dynamic peak pricing rate (essentially a CPP rate), a TOU rate and peak time rebate[8]; CA Pricing Pilot included a TOU rate, a fixed CPP rate and a variable CPP rate[9]; PowerCentsDC pilot included a CPP, a critical peak rebate, and hourly pricing[10]; and Oklahoma Gas & Electric's pilot included a TOU with CPP rate, and real time pricing with CPP.[11]
- By ignoring critical peaks, the Proposed Pilot Plan leaves money on the table – specifically, the large amounts of money that can be saved when customers reduce demand on precisely the right hours on the right days. Savings in energy, if they can be achieved, are uniquely susceptible to being returned promptly to the customers who make them possible. Whereas savings to the T&D system as a result of load management may occur primarily in the future vis-à-vis a theoretical business-as-usual baseline, such that finding present funds to compensate customers for load management is challenging, savings in energy costs as a result of smoothing peaks could be realized immediately. Such savings are not spread evenly across all summer days, but, rather, are available primarily during a few critical peak hours of the year – for example, the 100 hours per year when the most expensive critical peak energy purchases occur.
- Savings in energy bills may be a second-order matter for Con Edison, since energy is a pass-through for the Company, but for customers it is of prime importance. As such, the Proposed Pilot Plan's lack of features that give participants access to the large amounts of

[7] George, S., et.al. (2013). "SMUD Smart Pricing Option Pilot: Interim Load Impact Evaluation", Freeman, Sullivan & Co., page 1.
[8] Faruqui, A. and S. Sergici (2009). "BGE's Smart Energy Pricing Pilot Summer 2008 Impact Evaluation". The Brattle Group, page 1.
[9] Charles River Associates (2005). "Impact Evaluation of the California Statewide Pricing Pilot", page 16.
[10] eMeter Strategic Consulting (2010). "PowerCentsDC Program Final Report", page 2.
[11] See http://energy.gov/sites/prod/files/2013/06/f1/OGE_CBS_CaseStudy.pdf

money that can be saved at critical peak times is a serious shortcoming. This is particularly so in light of the Company's apparent insistence on an interpretation of "revenue neutrality", which (as discussed above) appears to limit the savings available to the participants.

- Moreover, even though the savings from the deferral or avoidance of T&D expansions by their nature materialize in the future, the opportunities for load modification that could enable such deferral or avoidance are also concentrated during a few critical hours of the year, which are locationally specific and may or may not coincide with critical peak supply prices (for example, the 40-48 hours per year when the distribution system is strained in the BQDM area). The inherited practice of ignoring those hours is a serious defect in how utility companies and their regulators think about cost-causation. Given the foreseen investments in Brooklyn and Queens that the Company hopes to defer through the BQDM program (and which we hope the Company will seek to avoid altogether), understanding how time-sensitive prices (and in particular, critical peak pricing) may help to further defer or avoid investments in distribution system expansion should be of crucial importance to the Company.

As noted above, many of the most successful time-sensitive rate pilots and deployments in the U.S. in recent years include a critical peak component. The Proposed Pilot Plan's failure to include such an option means that Con Edison is proposing to test an already antiquated approach to electric service pricing. By ignoring the specificity of these periods, the Proposed Pilot Plan puts forth a vision that is "time-sensitive" in only the crudest possible sense – only an incremental improvement on seasonal pricing.

It appears likely that the reason the pilot omits this useful feature is the Company's choice of metering technology. Given the very high costs of the meters that the Company proposes to use ($2,600,000/1600 meters=$1,625 per meter), and the limited customer benefit it proposes to harvest from these meters, we would like to see a cost comparison with advanced metering infrastructure, which would enable more state-of-the-art pricing options, such as critical peak pricing as a component of a residential demand response program.

Outreach Support for Participants

In addition, as we had brought up in discussions with Con Edison, we are concerned there will not be nearly enough education and outreach available to participants in the pilot who sense that their electricity bills are higher than they should be or otherwise would be, and are struggling to pay their bills. While we heartily support Con Edison's inclusion of shadow billing, it is possible that some people would receive a much lower shadow bill than what they need to pay under the pilot, resulting in hardship to the participant. Given that the Company proposes that pilot participants be locked into the pilot for two years without any form of bill protection measure, it

would be prudent for its proposal to include, at a minimum, targeted outreach to those facing modest, let alone steep, bill increases or to any participants seeking help to improve their responsiveness.

During the pilot, the Company needs to be on call to help customers in this position. Helpful mechanisms would include a hotline or email address through which participants could contact Con Edison if they are having problems, seeing very steep bill increases, or have questions about the program. Con Edison's argument that this type of outreach would be too expensive is unsubstantiated. Perhaps a serious analysis into the actual costs associated with this type of measure could demonstrate that it would be relatively cheap and result in greater success of the pilot and of time-sensitive rates in general than would be the case with the Company's proposal. If providing such assistance adds to the cost of the pilot, then we would strongly support approval of the necessary additional funding.

In discussions with Con Edison, the Company has said that the details of outreach and education will be included in their outreach plan, which will be finalized only after the pilot has been accepted. In addition to general outreach and education, we recommend the development of targeted outreach capabilities for participants experiencing difficulties reducing their peak demand. More broadly, to design an appropriate outreach component and optimize the usefulness of the input available from Collaborative participants who have been steeped in this initiative from its inception, Collaborative participants need the opportunity to review the model and provide feedback. Since it is an issue central to the success of the pilot, this cannot be a unilateral Con Edison decision.

Adverse Consequences of Locking Customers in for the Duration

The nature of the lock-in requirement is unclear on the face of the Proposed Pilot Plan. On page 9, the Proposed Pilot Plan states that "TOU Pilot participants will be required to participate for a two-year period." However, the last sentence of the same paragraph suggests that participants "may drop out" (and need to be replaced). This contradiction could be construed in one of at least two ways.

- There could be an absolute prohibition on participants quitting, but the last sentence could be intended to recognize that nonetheless participants will be lost, and the sample size reduced, as a result of factors other than quitting, such as participants moving away. Indeed, in the highly successful SMUD pilot, participants dropped out of the study due to moves at a rate many times greater than the rate at which they quit. Perhaps the relatively broad language of the last sentence is intended to recognize that some customers may have such a negative experience that they will find ways to drop out even if doing so is

expressly prohibited – for example, by terminating their electric service and opening a new service account under a new name.

- The "requirement" in the first sentence might be applicable not to the participants themselves, but to the pilot – i.e., perhaps participants will be free to go, but they cannot be deemed part of the study unless they remain in for two full years. This seems a less natural reading of the confusing language (as further discussed below).

To the extent that this requirement is applicable to the customers themselves, it should be rejected. Fundamentally, we can imagine two ways of applying time-sensitive energy pricing to residential customers. It could be done on a mandatory basis, or it could be voluntary. In a voluntary scheme, which is what is envisioned in the Proposed Pilot Plan (see page 8), part of the exercise is ensuring that what is being offered is sufficiently beneficial to customers to attract them to the novel price scheme and keep them there. Although strong reports of satisfaction by SMUD's highly satisfied customers are worth noting, their high acceptance rates and low drop-out rates are far more compelling.[12] Any pilot design feature that in effect relieves Con Edison of the challenge and responsibility of ensuring that the package they are offering is one that customers themselves find compelling is a feature that makes the exercise too alien to the actual marketplace to be relevant. Furthermore, the attrition rate (combined with exit surveys and other demographic information) can be very important and helpful information for the Company to use in future pricing offerings rolled out on a larger scale.

The Proposed Pilot Plan gives two justifications for requiring participants to remain in the pilot even if they're unhappy (which suggests that that is in the intention of the two year requirement):

- "This period will allow participants to see the benefit of the TOU Pilot Rate over an annual basis, which is necessary to take advantage of lower winter pricing and is consistent with the method in which the TOU Pilot Rate was designed.
- "It will also provide participants the opportunity to learn from their experience in the first year and potentially adjust behavior in the second year."[13]

With respect to the first stated reason, the idea that participants should be forced to stay with a program that is costing them money in one season so that they can see how it is more beneficial in a different season highlights a defect in the rate design. While pilot participants should expect to pay higher bills during the summer than the winter, this does not mean that the time-sensitive rate should be set in such a way that pilot participants could not expect to see bill decreases during the summer. For example, Oklahoma Gas and Electric's time-variant rate pilot had much

[12]Jimenez, L.R. et.al. (2013). "SmartPricing Options Interim Evaluation: An interim evaluation of the pilot design, implementation, and evaluation of the Sacramento Municipal Utility District's Consumer Behavior Study", U.S. Department of Energy/Lawrence Berkeley National Laboratory, page 158.
[13] Proposed Pilot Plan, page 9.

higher prices during the summer, yet on average customers were able to see $150 savings over the course of the summer.[14]

Regarding the second stated reason, it is not apparent how participants will learn from their experience in the first year if the Company declines to provide the type of outreach described in the prior section. The Proposed Pilot Plan would, by design, condemn some participants to an unfavorable price structure and deny them tools for adapting to it, and then (it seems) require them to remain in this regime for two years. For this reason, it is particularly important that participants be free to leave if the pilot is to move forward without outreach and assistance capability as described above.

If barriers to dropping out are important to the Company for some valid reason, a more moderate approach that gives the Company and the participants the opportunity to identify what's going wrong and find solutions would be far more useful than a ban on dropping out, which makes the study coercive. For example, perhaps a participant who wishes to drop out should be required to state a reason for withdrawing and give some reasonable period, such as 60 days' notice, before withdrawing. Such an arrangement would likely make it more attractive for customers who are not technological wizards to sign up to participate in the pilot, increase Con Edison's motivation to test out treatments and outreach capabilities that would reduce participant dissatisfaction, and contribute to the overall success of the pilot. After all, some portion of the participants will certainly be lost because they move[15], a prospect that would justify seeking out perhaps 500 participants in each of the treatment groups to assure that at least 400 customers participate through the end of the pilot.

Without this form of reassurance, it is unlikely that a potential participant who believes it *may* be beneficial, but is unsure *a priori* (i.e., a non-"natural winner"), would be inclined to join and take the complete risk of the rate. This is precisely the type of individual the company should want to have adopt the rate – with guidance, they could shift their consumption and provide benefits to the system. Instead, without any sort of reassurance of guidance or help, they may very likely avoid participating, leading to an influx of only natural winners into the program, which is unhelpful to the system as a whole and would render the study invalid. Temporary bill protection (e.g., for the first 3 months or so) or incentive payments (either made at the time of signing up or during the middle of the program) are commonly used in these types of pilot programs for just this reason[16]; the Company should consider that these types of incentives may help to sustain adoption and reduce the need to enforce a two-year mandatory enrollment.

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[14] http://energy.gov/sites/prod/files/2013/06/f1/OGE_CBS_CaseStudy.pdf

[15] In the Sacramento Municipal Utility District's SmartPricing Options Pilot Evaluation, they identified an attrition rate of approximately 25%, almost entirely due to participants moving. Con Edison has also said in discussions that approximately 20% of their customer base moves each year.

[16] PowerCentsDC Pilot paid a $50 incentive at sign up and another $50 at conclusion of the program (page 16); CA Statewide Pricing pilot paid $25 after completion of a survey, $75 for staying through the first year, and $100 at

If Con Edison is unwilling to accept any form of temporary bill protection or incentive payments and is also unwilling to reach out to those who are having problems with their bill, those who faced steep bills will reject the use of time-sensitive rates in the long run; those who would have been most helpful to the system will avoid entering the pilot; and if the rate structure remains as unfavorable as is currently proposed there is a likelihood of enormous dissatisfaction among those who do enter the pilot.

Correctly Establishing a Baseline for the Pilot and Estimating Elasticities

Con Edison has told EDF in discussions that the main purpose of the pilot is to measure elasticities of demand for electricity (which essentially describes how people respond to prices). However, in those same discussions, it is our understanding that the Company has also indicated that the control group will consist of customers randomly selected from the population eligible for the pilot, who will not be aware of their participation. If the Company moves forward in that manner, the estimated elasticity will most likely be incorrectly measured, in particular due to selection bias. Selection bias exists when a group of people who volunteer to be participants is structurally different from a control group comprised of people who did not volunteer, rendering any comparison between the treatment group and the control group invalid. The idea here is that there is an unobservable reason which incentivizes people to sign on to the program while also causing them to have measurable differences in their loads. Because we cannot capture this unobservable reason that differentiates those who volunteer to participate in the pilot from the randomly selected members of the control group who have not volunteered, there will likely be bias in the final estimation.

Selection bias is not always present in pricing pilots and indeed may not be an issue here; however, without explicitly controlling or testing for it[17], it has the potential to create a severe problem in that the resulting estimates may not be used to predict the impact of a future pricing mechanism. Eliminating sample selection bias from the estimates is difficult, but not impossible. Most importantly, the pilot should be set up in such a way as to attract the broadest range of individuals. Making the pilot attractive to all types of customers reduces the likelihood that the participants are structurally different from the average (such as being less peaky customers); see our discussions earlier as to how to make this pilot more accessible to a wider group of individuals. It is also possible to utilize some of the volunteers as a control group. This method

completion of the program (page 30); BGE Pilot paid $25 for completion of a survey mid-way through the program and another $25 for completion of a survey at the end of the program.

[17] Testing for selection bias in this case requires measuring whether the consumption loads of the treated are on average similar to the loads of the control group before any time-sensitive rate is imposed upon the treated.

would reduce the underlying unobservable differences between the control and treatment group, thereby minimizing the bias on the elasticity estimate.[18]

Con Edison has stated that there are problems in placing volunteers in a control group. We do not fully agree with the Company's arguments against this option, and without following this method, sample selection will likely remain; therefore, it is fundamental to carefully generate a valid control group. This can be done by establishing what the treatment group's load would have looked like had they not been exposed to time-sensitive prices (and making sure the load looks like the control group's load). This requires measuring the treatment group's loads for some time prior to the pilot kicking in- while it would be best to look for one year prior, it may not be necessary. For example, the PowerCentsDC pilot collected data for two months prior to the program beginning; this was sufficient to generate a baseline for the treated group and to be able to compare it to the control group (see page 30 of the pilot report as referenced in footnote 4). *Understanding what the loads looked like prior to the treatment is fundamental and generally cannot be avoided in any well-designed pilot.*[19] Unless this occurs, then the resulting estimates may be severely biased and therefore should not be relied upon to tell the Commission what will be the impact of time-sensitive prices implemented any part of the service territory. This is demonstrated in the following figure.

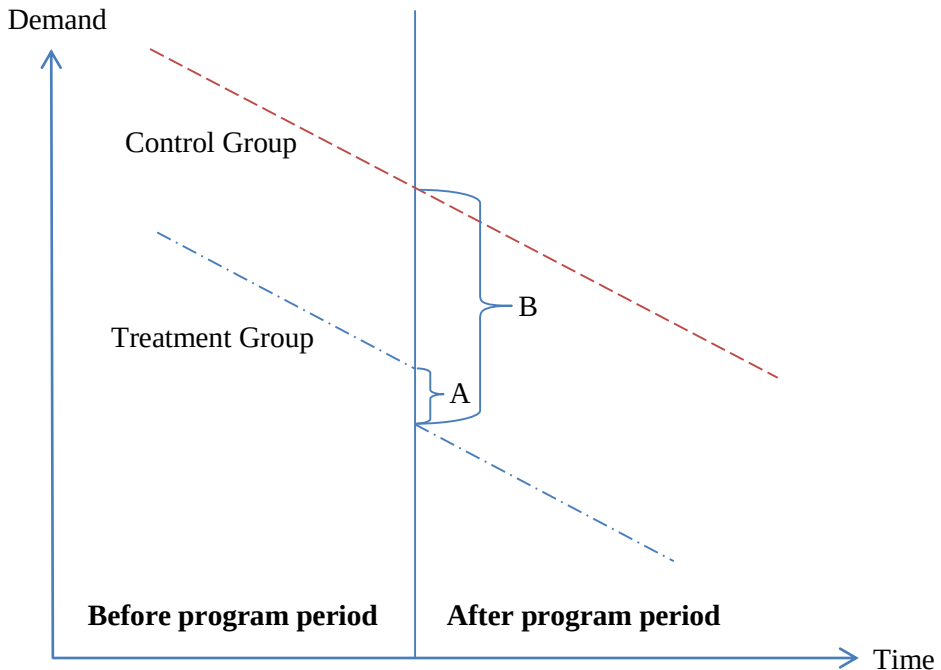


Figure 1: Sample Selection Bias in Estimating Elasticities

[18] Under this technique, the Company could make the assumption that baseline loads are the same for the control group as for the treatment group. Some bias may remain, but it is unlikely *as long as* the control group volunteers are chosen randomly, especially in terms of timing (i.e., when they volunteer).
[19] See footnote 18 for one exception to this rule.

Figure 1 shows how sample selection can affect the elasticity estimate. This example demonstrates a trend in demand before and after a program begins (these demand curves are not necessarily indicative of the impact of a time-sensitive pricing program as we would also need to measure shifting in consumption across time; instead, this is just a demonstration of experimental design). In this figure, both the control (top, red dashed line) and the treatment group (bottom, blue dashed line) have similar trends prior to the program period. If the control group's trend (i.e., the slope of the dashed line) was different than the treatment group's trend prior to the program period, then it would not be possible to correctly estimate the impact of the program. And, if the pre-period is not controlled for, then the estimated impact of the program would be the space between the red and blue lines, as marked by area B. However, the correct impact of the program is area A, which is much smaller than area B. This demonstrates that not controlling for the pre-trend may cause a significant overestimate of the elasticity.

Given that the Company has not described how they intend to establish a credible baseline and control group, we are concerned that elasticities will not be accurately estimated. This is especially true given that a pilot based on the Proposed Pilot Plan is unlikely to attract a random group of individuals. Instead, it will likely attract "natural winners"; i.e., those who have flatter than normal loads.[20] Those with typically peaky loads (e.g., average customers who come home after work at 6pm and turn on the A/C) may realize that the amount they would have to shift is extraordinary, resulting in minimal, if any, benefits. This will make it very difficult to find a valid control group- i.e., customers who are similar in load to those who signed up, but for some reason chose not to sign up (perhaps because they were not recruited or were unaware of the possibility of signing up). Additionally, if the pre-trend is not established, it will appear that the pilot had huge impacts on substitution from peak to off-peak periods. Essentially, if the treatment group has flatter loads than the control group *prior* to the pilot being implemented, and if the measurements of load begin simultaneously with the program period, the ex-post analysis will mistakenly attribute flatter loads to the TOU program, rather than identifying it as an artifact of the difference between the two groups (in Figure 1, this is the difference between measuring A vs B).

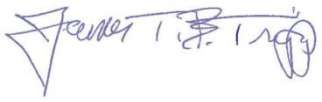
Furthermore, randomly selecting a blind control group from the population at large would make it difficult to understand the underlying effects on consumption within the control group. If the control group is blind, then Con Edison may not reach out to them for a survey to find out information about the household's demographics or use of enabling technology. These data points could help the Company design future rates and better understand what leads to voluntary adoption of time-sensitive rates in order to produce a rate that results in greater adoption and shifting, thereby generating larger reductions in system costs.

[20] While customers may not know what their loads look like, people who are generally out of the house during peak times -because they work late, for example- would know that this would be a winning proposition. These customers will have less of their loads during peak times.

Conclusion

We very much want to see Con Edison undertake a time-sensitive rate pilot expeditiously. We support several aspects of the proposal put forward by Con Edison. However, as noted above, several features of the proposal need to be redesigned to increase the likelihood of a successful outcome to this pilot.

Respectfully Submitted,



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