Gas Demand Response
Report on Pilot Performance – 2019/2020

Consolidated Edison Company of New York, Inc.
July 1, 2020
Case 17-G-0606
Case 14-E-0423

Contents

Executive Summary

Pursuant to the New York State Public Service Commission's August 9, 2018 *Order Approving with Modification Gas Demand Response Pilot*[1] ("August Order"), Consolidated Edison Company of New York, Inc. ("Con Edison" or the "Company") submits its second annual report of its Gas Demand Response ("DR") Pilot ("Gas DR Pilot" or "Pilot").[2]

Between November 1, 2019 and March 31, 2020 (the "2019/2020 Winter Capability Period"),[3] Con Edison operated its two-pronged Gas DR Pilot that tests the feasibility of incentivizing customers to provide net reductions of natural gas demand during the entirety of peak gas demand days (24-hour period from 10:00 am to 10:00 am the following day) on very cold winter days.[4] The Pilot Program consists of (1) a Performance-Based Gas DR offering for commercial and industrial ("C&I") customers and multi-family buildings with centralized heating systems and (2) a smart thermostat Direct Load Control ("DLC") offering for residential customers. The Pilot's objective is to understand the opportunity for customers to reduce usage over a peak gas demand day (see section 1.2 below).

Performance-Based Gas DR Offering

Con Edison enrolled 309 customers that pledged 2,886 dekatherms (dth) of peak day reduction for the 2019/2020 Winter Capability Period through its Performance-Based Gas DR offering. This offering relies on hourly gas consumption data collected through the Company's gas metering infrastructure, either Advanced Metering Infrastructure (AMI) or through legacy gas meters. The Company called one test event during the 2019/2020 Winter Capability Period, and based on the data currently available, calculated a reduction in gas load of approximately 1,291 dth during this test event.[5] Participating customers achieved on average an Event Performance

[1] Case 17-G-0606, Petition of Consolidated Edison Company of New York, Inc. for Approval of the Smart Solutions for Natural Gas Customers Program*, Order Approving With Modification Gas Demand Response Pilot*, (issued August 9, 2018) ("August Order").

[2] The August Order requires the Company to submit a report to the Commission by July 1 of each year during the term of the Gas DR Pilot to provide additional information to stakeholders, including information pertaining to successful and unsuccessful event response strategies and lessons learned, as well as a description of and justification for any Gas DR Pilot modifications the Company believes should be implemented for the 2020/21 Winter Capability Period.

[3] Appendix B contains a glossary that includes explanations of the pilot specific terms included in this filing.

[4] The trigger for Gas DR events is based on a forecasted average daily temperature at the Central Park weather station, and for the 2018-2019 and 2019-2020 Winter Capability Periods was 18 degrees Fahrenheit.

[5] At this time, the Company's metering information is incomplete based on field work restrictions from the ongoing COVID-19 pandemic. At the time of this report, manual meter data retrieval and analysis is pending for 119 customers. The Company is working to obtain and analyze the remaining meter data as soon as it can be safely accessed from customer premises. Con Edison will provide updated information by November 1, 2020 once retrieval and analysis of the remaining meter data for the 2019/2020 Winter Capability Period is completed.

Factor of 54 percent.[6]

DLC Gas DR Offering

An average of 2,804 devices were enrolled in the DLC Gas DR offering. The Company called two test events during the 2019/2020 Winter Capability Period. The average reduction in gas load, including the effects of snapback on gas usage, was between 0.014 and 0.028 dth per device with an average total removed load of approximately 56.1 dth per test event.[7]

During the second year of the Gas DR Pilot, the temperatures experienced on the coldest days were significantly warmer than recent years. As a result, the Pilot did not provide the hoped for insight into the behavior and capability of customers to provide load reduction at colder than normal temperatures.[8] Additionally, while the synergies in customer engagement and enrollment structure between the Company's electric DR programs and the Gas DR Pilot assisted in growing the Performance Based Offering from 39 to 309 customers year over year, enrollment was below the cap of 750 total customers budgeted for the second year, with only eight customers in the Westchester moratorium area. Despite this, customer enrollment and engagement efforts provided insights into the perspective of customers participating or considering participation in the Gas DR Pilot, as well as an understanding of how to better administer the pilot. A summary of lessons learned is listed below:

- Achieving the Pilot's objectives will not be possible without having Gas DR events that occur when the average daily outdoor temperature is closer to gas design day forecast.
- Potential participants and stakeholders believe the current incentive levels are insufficient to motivate customers to enroll.
- Most of the gas demand reductions in each capability period came from two customers employing the curtailment of gas-fired combined heat and power (CHP) generating equipment as their participation strategy. Additional customers and stakeholders indicated that current incentive levels are insufficient to drive participation for many customers capable of implementing this curtailment strategy.
    - Customers curtailing CHP output to reduce gas demand may experience increases in electric demand charges from reducing the onsite generation of electricity and also incur increased costs associated with shifting the thermal load from the CHP unit to backup heating equipment running off of another firm gas account or Con Edison steam service. This increase in costs has the potential to eliminate all or a significant portion of the incentive to curtail gas load from the CHP generator. This impact becomes more

[6] As noted above, this information will be updated, if necessary, by November 1, 2020.

[7] Evaluation of the DLC Gas DR Pilot was not impacted by COVID-19 as usage information was available through the Nest and Honeywell thermostats.

[8] The Con Edison gas supply portfolio is designed to meet the needs of its firm customers for a 0 degree Temperature Variable that is equal to 70 percent of the current day's Gas Day Average dry bulb temperature and 30 percent of the prior day's Gas Day Average dry bulb temperature (the "Design Day"). In the 2018-2019 winter, the coldest average daily temperature observed was 13 degrees Fahrenheit. In the 2019-2020 winter, the coldest average daily temperature observed was 22 degrees Fahrenheit.

significant as the total number of Gas DR events in separate electric/steam billing cycles occurs.

- The 2019-2020 incentive structure for the Performance-Based Offering valued load relief equally in northern Manhattan, the Bronx and Westchester and is no longer consistent with geographically-based benefits used in the Benefit Cost Analysis (BCA).
- The timeframe between the enrollment deadlines in the Performance Based Offering and the start dates for the Winter Capability period does not allow sufficient time for the installation of AMI for customers that require these meters for participation. This creates a risk of not having 30 days of hourly interval meter data needed to determine performance if an event is called early in the winter.
- Marketing and customer engagement for the DLC Gas DR offering was effective at increasing enrollments and surpassing the original enrollment target of 1,000 participating customers.

Considering these lessons learned, the Company plans to make the following changes to the Pilot for the 2020/2021 Winter Capability Period:

For the Performance-Based offering:

1. The Company will update incentive values based on stakeholder feedback. Updates to the incentive zones reflect the geographically based benefits in the BCA methodology used in the Company's recent Non-Pipelines Solutions Request for Information solicitation.[9]
2. The Company will modify the enrollment deadlines for customers that require an AMI meter be installed in order to participate, as described in metering option 4 of the Pilot Guidelines. Customers that wish to participate via this metering option will need to enroll by September 1, 2020 for a November 1, 2020 start date and by October 1, 2020 for a December 1, 2020 start date.

For the DLC Gas DR offering:

The Company will remove the original target enrollment for the DLC Pilot of 1,000 participating customers and continue accepting new enrollments unless constrained by the approved budget.

[9] https://www.coned.com/-/media/files/coned/documents/business-partners/business-opportunities/non-pipes/non-pipeline-solutions-to-provide-peak-period-natural-gas-system-relief-rfi.pdf?la=en

1 Gas DR Pilot Overview

Con Edison delivers natural gas to approximately 1.1 million customers in Manhattan, the Bronx, the First and Third Wards of Queens, and most of Westchester County. Natural gas is delivered by interstate pipelines to Con Edison at various points in or near its service territory and is distributed to customers through approximately 4,300 miles of mains and 370,000 service lines.

1.1 Background to the Gas DR Pilot

To address increased customer demand for natural gas in its service territory and limited transmission pipeline capacity, Con Edison proposed the Smart Solutions for Natural Gas Customers Program (the "Smart Solutions Program").[10] As part of the Smart Solutions portfolio, Con Edison operated the Gas DR Pilot for its second year during the 2019/2020 Winter Capability Period.

1.2 Pilot Objectives

The Gas DR Pilot tests the feasibility of incentivizing customers to provide net reductions of natural gas demand during peak gas demand days (for a 24-hour period from 10:00 am to 10:00 am the following day) on the coldest winter days.

The overall goals of the Gas DR Pilot are to:

- Understand the magnitude of net load reduction that customers can provide over a 24-hour window from 10:00 am to 10:00 am the following day after receiving notification of an event;
- Test customer engagement as measured by the number of customers enrolled and participant response;
- Assess third-party participation as measured by number of aggregators enrolled and aggregator response;
- Streamline event dispatch based on internal and external stakeholder response;
- Test the participants' ability and willingness to participate in consecutive multi-day events and, if necessary, events on holidays;
- Collect information on successful customer use reduction strategies;
- Determine appropriate program incentive levels;
- Test customer baseline load (CBL) methodologies; and
- Provide data on reliability and repeatability of total reductions during events, as an input to Con Edison's peak day gas demand forecasting process.

[10] Case No. 17-G-0606, *Petition of Consolidated Edison Company of New York, Inc. for Approval of the Smart Solutions for Natural Gas Customers Program*, (filed September 29, 2017).

2 Performance-Based Gas DR Offering

The Performance-Based Gas DR Offering is open to all gas customers using firm gas delivery service, including residential and commercial customers, one calendar year prior to enrollment and who can curtail gas consumption or reduce gas usage by switching to electricity or steam during event days.[11] The Pilot's primary focus is on C&I gas customers and multi-family buildings with centralized gas heating systems.[12]

2.1 Marketing and Customer Engagement

Program marketing efforts focused helping customers, primarily aggregators and limited larger C&I customers, understand the objectives of the Pilot and the ways in which they can participate.

To advertise the Pilot, Con Edison:

- Held a Gas Demand Response forum for stakeholders and participants to discuss results from the 2018/2019 Winter Capability Period and the changes proposed for the 2019/2020 Winter Capability Period;
- Educated customers and aggregators during three enrollment webinars (two in September 2019 and one in October 2019), the Company's Demand Response Forum for its electric DR programs, and at an informational breakfast on Con Edison's Energy Efficiency and Gas Demand Response incentives for Westchester C&I customers;
- Educated and received feedback from specific electric DR aggregators, electric DR direct participants, energy efficiency multifamily and energy efficiency C&I program participants on the structure and incentives available in the Gas DR Pilot. Updated the Company's website[13] with information on the overall Gas DR Pilot, including a link to Con Edison's DR email address for further questions;
- Revised and redistributed the Pilot guidelines;

[11] Demand reduction via switching to fuel oil or other liquid fuels that result in an increase in customer emissions during a gas DR event is not permitted. Dual enrollment in the Performance-Based Gas DR Pilot and the DLC Gas DR Pilot is not permitted.

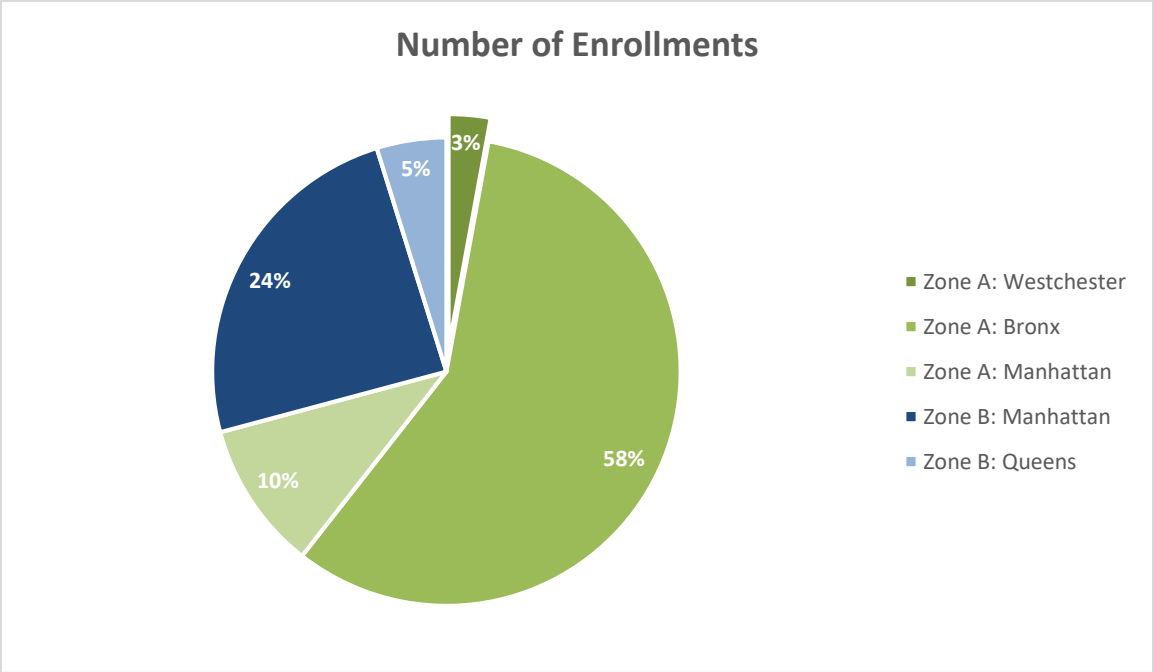
[12] Case 17-G-0606, Petition of Consolidated Edison Company of New York, Inc. for Approval of the Smart Solutions for Natural Gas Customers Program, Gas Demand Response Pilot Implementation Plan, 2018-2021 (the "Implementation Plan") (filed September 10, 2018, and updated July 1, 2019). For more detail on the Company's Performance-Based Gas DR Pilot, such as operational parameters, enrollment, eligibility requirements, and incentive payments, see the Pilot's Implementation Plan and the Performance-Based Gas DR Guidelines on the Company's website.

[13] https://www.coned.com/es/save-money/rebates-incentives-tax-credits/rebates-incentives-tax-credits-for-commercial-industrial-buildings-customers/smart-usage-rewards/smart-usage-rewards-for-reducing-gas-demand

- Updated the one-page program summary and FAQs page; and
- Updated the online approved aggregator list[14] to include aggregators who can support customers interested in the Performance-Based Gas DR Pilot.

Figure 2-1: Customer Distribution by incentive zone and area (% of total enrolled) shows the distribution of enrollments by incentive zone and area in the Company's service territory as a percentage of the total number of enrollments.

Figure 2-1: Customer Distribution by incentive zone and area (% of total enrolled)



At the end of the 2019/2020 Winter Capability Period, Con Edison solicited feedback from participating aggregators, direct participants, and the customers enrolled through aggregators. Through an online survey, Con Edison also engaged with electric program participants/aggregators that did not participate in the Gas DR Pilot to solicit their feedback. The surveys focused on the enrollment process, various participation strategies, suggestions to improve the Pilot, the incentive values and the likelihood of participants enrolling and/or returning to the Gas DR Pilot for the 2020/2021 Winter Capability Period.

A summary of overall feedback received from stakeholders and participants is included below:

- Multiple aggregators in the Company's electric demand response programs either chose not to participate or to limit participation due to the incentive levels being too low to encourage customer acquisition.

[14] https://www.coned.com/-/media/files/coned/documents/save-energy-money/rebates-incentives-tax-credits/smart-usage-rewards/aggregator-list.pdf?la=en

- Multiple customers and/or aggregators representing customers with gas-fired CHP generating equipment noted that they would incur increased electric demand charges from reducing the onsite generation of electricity and also incur increased costs associated with shifting the thermal load from the CHP unit to heating equipment served via another firm gas account or Con Edison steam service. These shifts have the potential to eliminate all or a significant portion of the incentive to curtail gas load from the CHP generator if they were to reduce gas usage during a Gas DR Pilot event. As a result, these customers either chose not to participate or stated that too many events during the season would result in the decision not to curtail load during an event without additional incentives to cover the electric demand charges.
- All survey respondents that participated in the Pilot during the 2019-2020 season indicated they are likely to return in the upcoming capability period.

2.2 Event Performance

Con Edison called one test event during the 2019/2020 Winter Capability Period. Based on the data currently available, Con Edison observed a reduction in gas load of approximately 1,291 dth during the test event. These customers achieved an Event Performance Factor of 54 percent.

Although there were 309 customers enrolled in the program in the 2019/2020 Winter Capability Period, Table 2- summarizes the performance for the customers whose load data could be retrieved and analyzed. Con Edison will file updated performance results once retrieval and analysis of the remaining meter data for the 2019/2020 Winter Capability Period is completed. Due to data storage limitations on existing metering equipment, meters that have not had the data retrieved by July 14, 2020 will not have sufficient data to calculate performance. These customers will be paid assuming performance at 100% of their pledged load reduction.[15]

Table 2-2: Performance-Based Gas DR Pilot Event Performance for 2019/2020

Event / Test	Date	Average Temperature (°F)	Customers Measured[16]	Dth Enrolled	Dth Reduction Achieved	Average Event Performance Factor[17]
Test	2/14/20	22	156	2096	1,291	54%

[15] As noted in footnote #4, Con Edison will file updated results by November 1 after retrieval and analysis of the remaining meter data for the 2019/2020 Winter Capability Period is completed.

[16] In addition to the 119 meters currently pending interval data retrieval and analysis, issues with meter installations prevented accurate recording of hourly interval data for 34 customers.

[17] As defined, the event performance factor is the is the ratio of (i) the therms of Load Relief provided during a Planned Event or Test Event up to the Enrollment Value, to (ii) the Enrollment Value. The Event Performance Factor is rounded to two decimal places and has an upper limit of 1.00 and a lower limit of 0.00. The Event Performance Factor is calculated for each participating customer. The average event performance factor shown above is the simple average of all the customer's individual event performance factors.

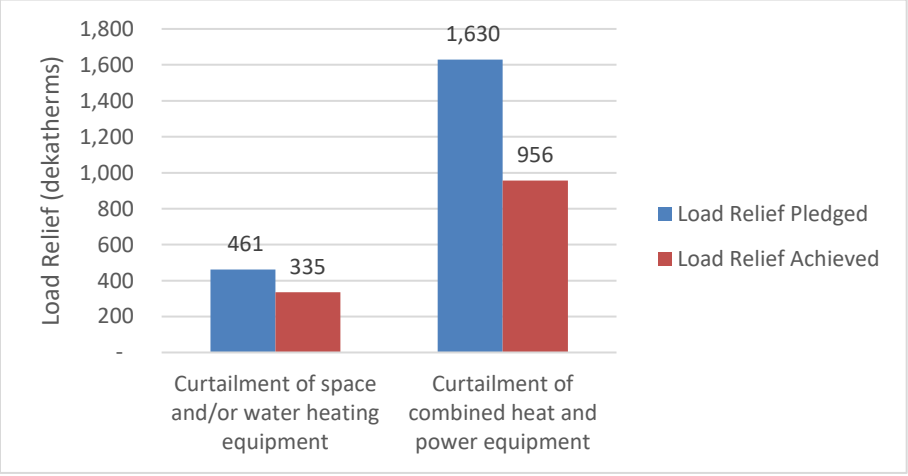
2.3 Measurement

The Performance-Based Gas DR offering measures customer load reduction by comparing the actual metered load on the event day to either an average day or weather adjusted CBL according to the Pilot's Load Relief Verification Methodology. Three of 309 customers enrolled had their performance measured with the average day CBL; the remaining customers' performance was measured using the weather adjusted CBL for all events.[18] The existing baseline methodology for a 24-hour Gas DR event period is a novel practice in the industry and is based on limited data for historical customer hourly and daily gas usage. To measure customer performance accurately, the Company is currently evaluating various Load Relief Verification Methodologies to determine the accuracy and bias with which customer's load relief strategies can be measured. The Company expects to report on the findings in the 2021 annual report after analysis of the 2020/2021 Winter Capability Period is completed.

2.4 Event Response Strategies

Participant growth in the 2019/2020 Winter Capability Period occurred largely in the multifamily residential customer segment, where participants curtailed heating load through the adjustment of setpoints for thermostats, hot water, and boiler control system. Other strategies utilized were the curtailment of CHP equipment and the shutdown of a commercial process load. While CHP and process load customers made up a small percentage of the overall enrollment numbers, they contributed 956 dth out of the 1,291 dth of load reduction observed. Figure 2- below shows a breakdown of the pledged load relief and the achieved load relief for the customers with data currently available.

Figure 2-4: Customer pledge vs performance by participation strategy



[18] For customers who had performance measured with the weather adjusted CBL, each customer's adjustment factor was calculated using the difference between heating degree hours during the event day compared to the average heating degree hours during the CBL days. The Company is currently evaluating various Load Relief Verification Methodologies to determine the accuracy and bias with which customer's load relief strategies can be measured with existing metering infrastructure.

3 DLC Gas DR Offering

The DLC Gas DR offering is the residential-focused component of the Company's Gas DR Pilot. Participants in Con Edison's DLC Gas DR offering can use Wi-Fi enabled thermostats (Smart Thermostats) to control heating equipment and reduce gas demand at times of critical system need. These customers have the ability to remotely control their equipment through a personal computer or mobile device at all times and can override events called by Con Edison regardless of the customers' location.[19]

3.1 Marketing and Customer Engagement

Con Edison's marketing efforts for the DLC Gas DR offering were focused on generating awareness of the Pilot for eligible customers participating in the electric Bring Your Own Thermostat ("BYOT") program and promoting the energy efficiency and DR incentives associated with smart thermostats simultaneously.[20] The Company used its web page as a channel for marketing by leveraging existing Company sites promoting the BYOT program and Performance-Based Gas Pilot. The Smart Thermostat website was updated to include information about the additional rebate available for enrollment in the DLC Gas DR Pilot. Links and information were included on the Gas Smart Usage Rewards page, directing customers to the Smart Thermostat page. The Company also included the Smart Thermostat incentives in its Winter Prep Press Releases. The DLC Gas DR Pilot includes two thermostat delivery partners, Resideo[21] and Nest. By the last test event in the 2019/2020 Winter Capability Period, the DLC Gas DR Pilot achieved enrollment of 2,817 thermostats through the Resideo and Nest platforms. Customers with Nest thermostats were added for the 2019/2020 Winter Capability Period and this enabled further customer participation and further testing of various participation strategies. Resideo and Nest included information about the DLC Gas DR Pilot and links to Con Edison's Smart Thermostat website on their respective websites. In-app notifications were also sent to notify customers of their eligibility to participate.

3.2 Event Performance

The DLC Gas DR Pilot had two test events, one on February 14 and one on February 21, during the 2019/2020 Winter Capability Period. Different combinations of time of day, thermostat reductions and event lengths were tested to observe how various event parameters affect the amount of load relief achieved during an event, the amount of load reduction lost due to the effect of snapback after an

[19] For more detail on the Company's DLC Gas DR Pilot, see Section 4 of the Gas DR Pilot Implementation Plan being updated concurrently.

[20] https://www.coned.com/en/save-money/rebates-incentives-tax-credits/rebates-incentives-tax-credits-for-residential-customers/bring-your-thermostat-and-get-$85

[21] Resideo uses thermostat adjustment to achieve gas load reduction during events specifically for Honeywell Home brand thermostats.

event, and the percentage of customers that chose to opt-out of an event. The February 14 event was called to coincide with the evening peak in residential gas consumption and the February 21 event was called to coincide with the morning peak in system gas consumption. Each event lasted four hours for Nest thermostats[22] and six hours for Honeywell thermostats, which are controlled via the Resideo platform. Table 3-2 shows the average reduction in gas load over the course of the two test events, including the effects of snapback to the level of usage established prior to the start of the DR event. The average removed load per device, including snapback, was between 0.015 and 0.027 dth per device, with an average total net removed load of approximately 56.1 dth per event.

Table 3-2: Summary of Event Performance in the 2019/2020 Winter Capability Period

Event Date	Event Time	Thermostat Manufacturer	Total Devices Enrolled at Time of Event	Opt-Out Rate (% of devices enrolled)	Average Removed Load, including snapback (dekatherms/ device)	Net Removed Load, including snapback (dekatherms)
2/14/20	4:00 PM - 10:00 PM	Honeywell	935	23%	0.020	19.10
2/14/20	6:00 PM - 10:00 PM	Nest	1,856	23%	0.015	27.98
2/14/20 Event Total			2,791	23%	0.017	47.08
2/21/20	7:00 AM - 1:00 PM	Honeywell	935	18%	0.027	25.45
2/21/20	7:00 AM – 11:00 AM	Nest	1,882	15%	0.021	39.77
2/21/20 Event Total			2,817	16%	0.023	65.22
Season Average			**2,804**	**19%**	**0.020**	**56.1**

Con Edison was able to measure the reduction in the gas load and also measured significant snapback from participating customers. Snapback reduced calculated gas load reduction by an average of 52 percent during the 2019/2020 Winter Capability period. Con Edison used a combination of different temperature setbacks and control strategies to mitigate snapback among the enrolled customers. For each event, participating customers, grouped by thermostat manufacturer, were randomized into two groups and assigned different participation strategies during each call window. The second group's strategy was designed to minimize snapback.

For the first group of Honeywell devices, a 3-degree setback was applied for the majority of the event with a 1-hour setback in the middle of the event. For the second group of Honeywell devices, a 3-degree setback was applied, then lowered to a 2-degree setback during the fifth hour of the event and then lowered to a 1-degree setback for the final hour.

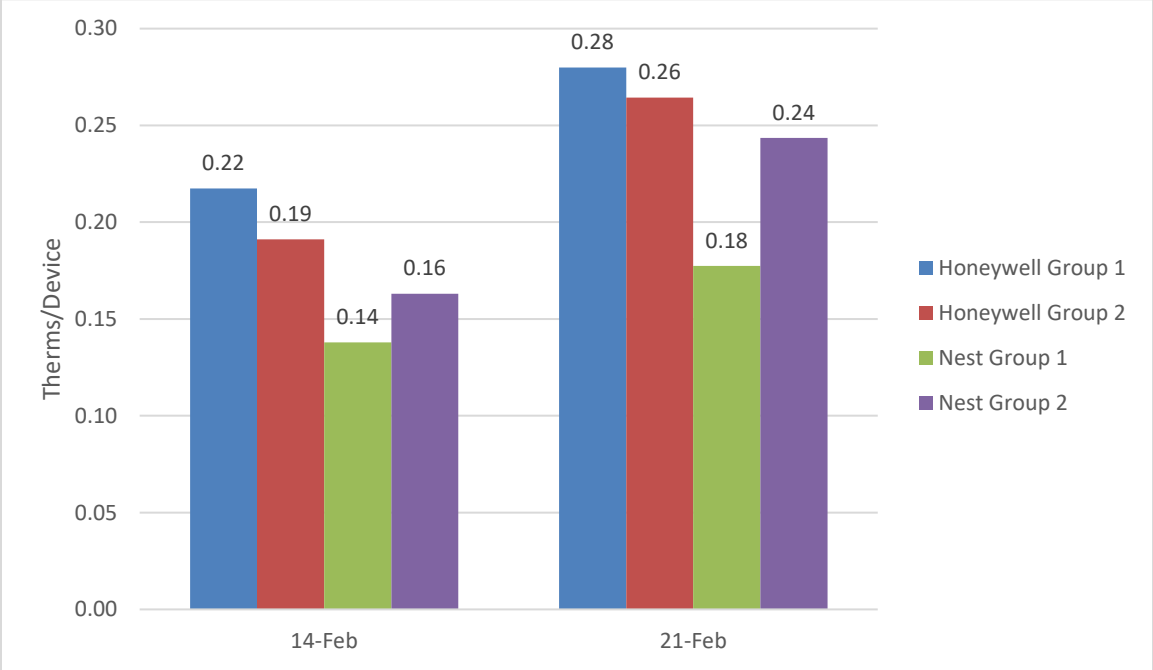
Nest's platform allows program managers to choose an after-event option called "smoothing." This

[22] Nest devices are restricted to a maximum of a 4-hour event window.

option is designed for electric demand response programs to mitigate the impact of simultaneous unit snapback by allowing thermostats to resume normal operation at different times within the last 30 minutes of the event. For the first group of Nest devices, the after-event smoothing option was not selected. For the second group of Nest devices, the after-event smoothing option was selected. While smoothing was not specifically designed to mitigate the overall snapback effect for Gas DR events, it was applied to the second group to test the difference in per device reduction achieved when selected.

As shown below in Figure 3-2, the most successful strategy employed was the first group of Honeywell devices resulted in the greatest reduction in load during the morning peak in residential consumption from the event on February 21, 2020 (7:00 am to 1:00 pm).

Figure 3-2: Performance for each event by thermostat adjustment strategy



4 Costs for 2019/2020

Con Edison's Implementation Plan includes a budget estimate for the Gas DR Pilot for meter data collection, customer incentives, and Pilot administration based on estimated adoption rates within Con Edison's customer base. A summary of the costs incurred during the second year of the Gas DR Pilot is provided below.

4.1 Cost Breakdown

The total cost for the second year of the Gas DR Pilot are estimated to be $608,160.[23] Costs were lower than budgeted mainly due to lower than expected customer enrollment, performance and customer incentive payouts. A breakdown of costs is provided in **Error! Reference source not found.** below.

Table 4-1: Estimated Gas DR Pilot costs for the 2019/2020 Program Year

Category	Costs	Budget	Variance
Meter Data Collection	$6,828	$154,500	($147,672)
Customer Incentives	$497,013	$968,170	($471,157)
Pilot Administration	$167,912	$540,000	($372,088)
Total	$671,753	$1,662,670	($990,917)

4.2 Meter Data Collection

The Gas DR Pilot Implementation Plan describes four metering options for customers participating in the Performance-Based Gas DR Pilot, including two options that involve data collection by Con Edison at the premises of customers who are not equipped with gas AMI meters, Building Management Systems ("BMS") or Energy Management Systems ("EMS") that record hourly interval data.

During the 2019/2020 Winter Capability Period, the Company incurred limited expenses for meter data collection and deployment of additional metering hardware to customer premises. This was primarily due to: (1) less required up front work on existing volume correctors and (2) manual data retrieval only occurred at the end of the season since there were no events or test events early in the capability period.

[23] This estimate includes the incentives for 119 participants in the Performance-Based Pilot, assuming performance at 100 percent of the pledged load relief. The Company will provide updated costs for actual incentives and any additional meter data collection costs that are incurred by November 1, 2020

4.3 Customer Incentives

Customer incentives for the 2019/2020 Winter Capability Period consisted of payments to customers for their participation and performance in the Performance-Based Pilot and payments paid to customers for enrollment in the DLC Pilot. For the Performance-Based Pilot, performance was based on the one test event that was called during the 2019/2020 Winter Capability Period. The costs shown in Table 4-1 contain estimated Performance-Based incentives of up to $170,000 for the 2019/2020 Winter Capability Period that are expected to be paid once meter information is obtained. Customer incentives for performance are expected to increase during the 2020/2021 Winter Capability Period as a result of the new proposed incentive structure described in Appendix A, increased enrollments, and more accurate pledges from participants, which will lead to an improved average performance factor. The DLC Pilot provides a one-time, up-front incentive for enrollment. Incentive costs for the DLC Pilot are expected to increase as enrollment increases but remain predictable, as Pilot participation is directly related to the number of enrolled thermostats.

4.4 Pilot Administration

Pilot administration includes costs from incremental Con Edison staff dedicated to the Gas DR Pilot, costs for the third-party vendors in the DLC Gas DR Pilot, costs associated with marketing the Gas DR Pilot, and costs for third-party evaluation of the load relief achieved from the Pilot. The increase in Pilot administration costs are primarily the result of dedicating one full-time employee to the Pilot and engaging with a third-party to evaluate and improve load reduction evaluation methodologies for both the Performance-Based and DLC offerings. A third-party evaluation effort is ongoing and additional administrative costs will be incurred to continue assessment of the Pilot's Load Relief Verification Methodology. As a result, Pilot administration costs are expected to increase over the next year as the Pilot continues to mature.

5 Conclusions

The lessons learned from the 2019/2020 Winter Capability Period of the Gas DR Pilot and the changes the Company is planning to make for the 2020/2021 Winter Capability Period are summarized below to address observed limitations and to improve the overall effectiveness of the Pilot.

5.1 Lessons Learned

Lessons learned from the 2019/2020 Winter Capability Period of the Gas DR Pilot are outlined below. The planned changes to the Pilot are a direct result of these insights and the proposed program changes are included in the Implementation Plan that is being concurrently filed.

1. **Achieving the Pilot's objectives will not be possible without having Gas DR events that occur when the average daily outdoor temperature is closer to 0 degrees.**
    - The 2018-2020 and 2019-2020 winters did not allow for customers to curtail space heating equipment or to predict customer load and accurately calculate load relief achieved at temperatures at or approaching the gas system's peak design day temperature of 0 degrees.
2. **Potential participants and stakeholders believe the current incentive levels are insufficient to motivate customers to enroll.**
    - In response to a survey sent to stakeholders, multiple aggregators in the Company's electric demand response programs either chose not to participate or chose to limit participation due to the incentive levels being too low to encourage customer acquisition.
3. **While the majority of load reduction observed in the 2019/2020 Winter Capability period came from two customers employing the curtailment of gas-fired CHP generating equipment as their participation strategy, additional customers and stakeholders indicated that current incentive levels are insufficient to drive participation for many customers capable of implementing this curtailment strategy.**
    - Increases in electric demand charges from reducing the onsite generation of electricity and also incur increased costs associated with shifting the thermal load from the CHP unit to another firm gas account or Con Edison steam service. This increase in costs has the potential to eliminate all or a significant portion of the incentive to curtail gas load from the CHP generator. This impact becomes more significant as the total number of Gas DR events in separate electric/steam billing cycles occurs.
    - The total number of customers with CHP generating equipment who operate that equipment using a firm gas rate (as opposed to interruptible gas rate) is relatively limited throughout Con Edison's service territory when compared to the space heating load and is primarily located in New York City.
    - The Gas DR Pilot places the same value for load relief regardless of the technology used to achieve the reduction. Therefore, The Company does not believe that load relief from CHP

curtailment warrants additional incentives when compared to load relief from other participation strategies.

4. **The 2019-2020 incentive structure for the Performance-Based Offering valued load relief equally in northern Manhattan, the Bronx and Westchester and is no longer consistent with geographically based benefits used in the Benefit Cost Analysis (BCA).**
    - Con Edison plans to re-structure the geographic zones to match the geographically-based benefits in the BCA and to further incentivize enrollment in the Westchester moratorium area.
5. **The timeframe between the end of the enrollment period and the beginning of the Winter Capability Period is not sufficient for installation of AMI meters, which could impact the Company's ability to measure performance if an event were to occur early in the Winter Capability Period.**
    - There is currently one month between the end of the enrollment periods and their associated season start dates.
    - This process is currently inconsistent with the Company's electric demand response programs where metering upgrade work is required to be completed prior to enrollment and ensures that the Company has a minimum 30 days of interval meter data before customers commence participation.
    - Increasing the timeframe between the end of the enrollment period and the participation start dates will also allow for more time to identify issues with metering and allow for corrections to be made early in the season if necessary.
6. **Marketing efforts for the DLC Offering were effective at increasing enrollment.**
    - A large portion of the new enrollments occurred after in-app messages were sent to customers from the thermostat providers.
7. **Additional strategies for reducing load through the DLC Gas DR offering should be tested to continue optimizing the load reduction available per device, which will help inform the Pilot's ability to scale.**
    - While the test events provided some insight into how different thermostat setback strategies performed relative to one another, additional insights into how customers' equipment and behavior affects the ability to reduce load at temperatures at very cold temperatures that are comparable to the gas system's peak design day temperature of 0 degrees are needed to inform the Pilot's ability to scale.

5.2 Changes for 2020/2021 Winter Capability Period

Based on the lessons learned and the observed performance in the prior two operational periods for the Gas DR Pilot, Con Edison plans to make the following changes ahead of the 2020/2021 Winter Capability Period.

1. **Modify the incentive levels for the Performance-Based Offering Reservation Payment option and the zones to reflect updated value of load relief by geographic area.**
    - See Appendix A for a map of the updated zones, the incentive levels by zone, and a list of zip codes for each zone.
    - The revised incentive levels were informed by a customer survey and achieve the goal of sending distinct price signals based on relative benefits of the program to each geographic area.[24]
2. **Revise the enrollment deadlines for customers in need of AMI installation to allow enough time for AMI installation and sufficient data collection for the CBL calculation.**
    - The updated enrollment deadlines for customers requiring AMI installation are:
        - September 1 enrollment deadline for November 1 start date.
        - October 1 enrollment deadline for December 1 start date.
    - Enrollment deadlines for the remaining metering options will remain unchanged.
        - October 1 enrollment deadline for November 1 start date.
        - November 1 enrollment deadline for December 1 start date.
3. **Remove the overall target enrollment of 1,000 participating customers for the DLC offering and allow it to grow as constrained within the existing authorized budget.**
    - The original target of 1,000 participating customers was exceeded during the 2019/2020 Winter Capability Period within the confines of the existing budget.
    - Continuing to increase enrollments will allow for additional testing groups to be created and increase simultaneous testing of various thermostat adjustment strategies during the third year of the offering.
    - DLC pilot enrollments will be closely monitored throughout the 2020/2021 Winter Capability Period to ensure costs remain within the authorized budget.

[24] An updated assessment of the cost effectiveness of this Pilot will be conducted for the 2021/2022 annual report.

Appendix A: Performance-Based Offering Incentive Updates

Table A-1: 2019-2020 Performance-Based Gas DR Pilot Incentive Levels

Payment Structure	Zone A (Rye/White Plains, North Bronx, North Manhattan)	Zone B (Southern Bronx, Queens, Southern Manhattan)
Monthly Reservation Payment ($/Therm-day of Net Load Relief per DR month)	$9	$5
Performance Payment during DR event ($/Therm-day of Net Load Relief per DR event)	$1	$1
Holiday / 3 Consecutive Event Days / Voluntary Performance Payment ($/Therm-day of Net Load Relief per DR event)	$2	$2
Estimated Total Payment ($/Therm-day per DR season) for Net Load Relief during a 'typical winter season' based on historical weather data	$50	$30

Figure A-1: 2019-2020 Performance-Based Gas DR Offering Incentive Zones

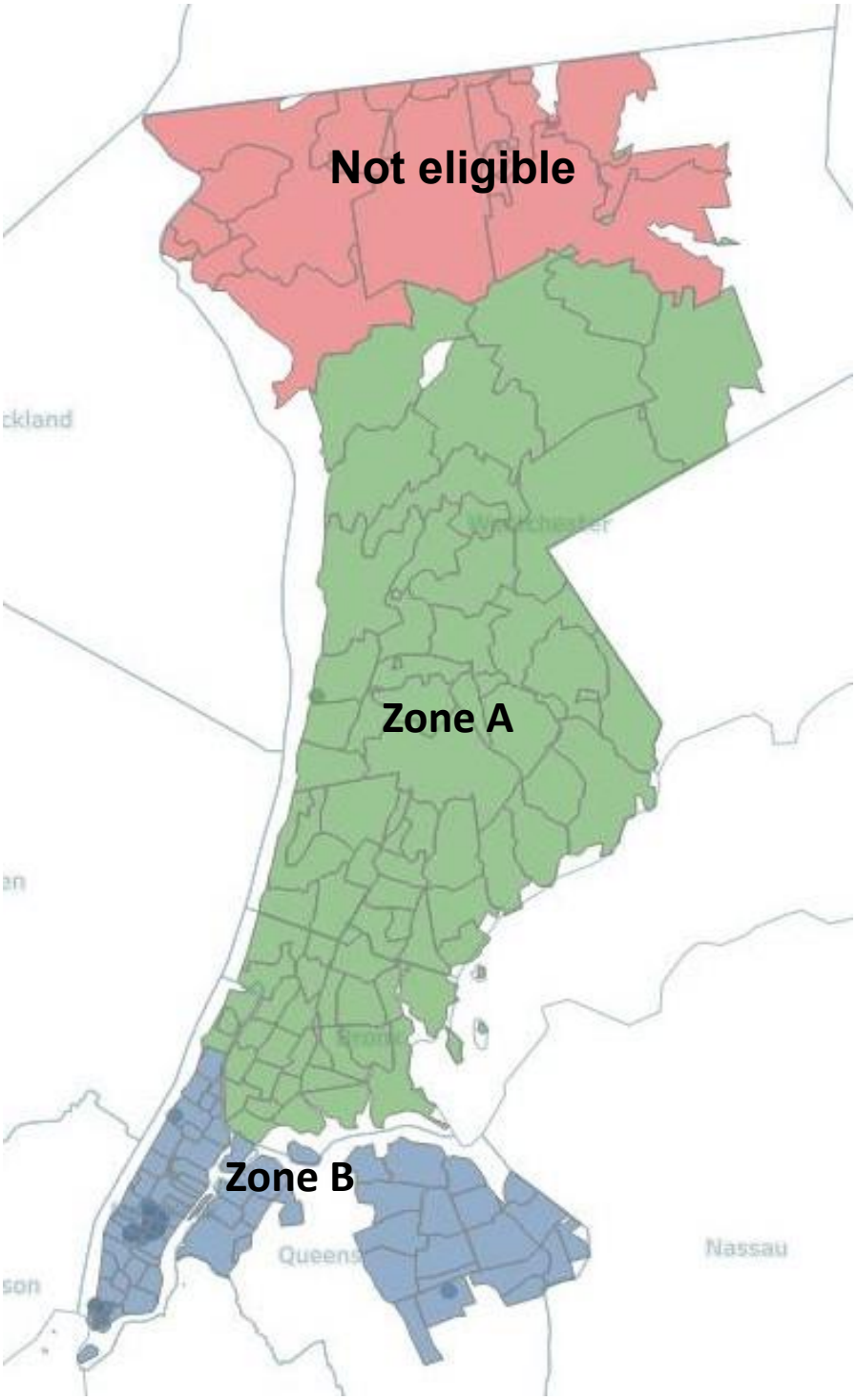


Table A-2: Updated zones and incentive values in the Performance-Based Gas Demand Response Offering.

Payment Structure	Zone 1 (Westchester Moratorium Area)	Zone 2 (New York City portion of Con Edison's gas service territory)	Zone 3 (Westchester north of moratorium area within Con Edison's gas service territory)
Monthly Reservation Payment ($/Therm-day of Net Load Relief per DR month)	$12	$7	$5
Performance Payment during DR event ($/Therm-day of Net Load Relief per DR event)	$1	$1	$1
Holiday / 3 Consecutive Event Days / Voluntary Performance Payment ($/Therm-day of Net Load Relief per DR event)	$2	$2	$2
Estimated Total Payment ($/Therm-day per DR season) for Net Load Relief during a 'typical winter season' based on historical weather data	$65	$40	$30

The map below divides the Con Edison gas service territory into three zones, indicating the incentive value of load relief in each zone.

Figure A-2: Approximate boundaries of Con Edison's Natural Gas Service Territory and the 2020-2021 Gas DR incentive values of each zone.

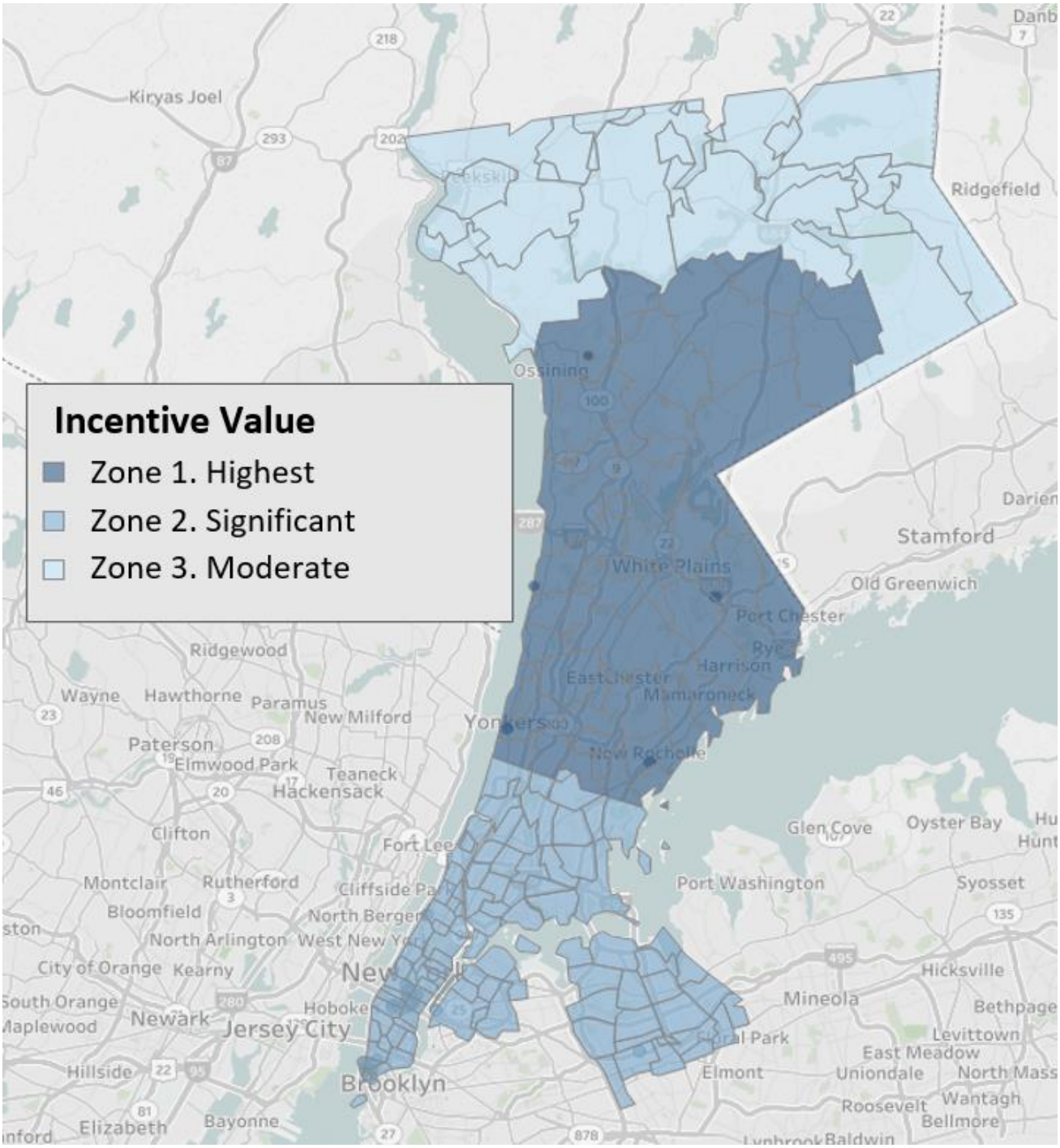


Table A-3: List of Zip Codes in Con Edison's Natural Gas Service Territory and the 2020-2021 Gas DR incentive value of each zip code.

Gas Reduction Value	ZIP	Location
Zone 1. Highest	10502	Westchester
	10503	Westchester
	10504	Westchester
	10506	Westchester
	10507	Westchester
	10510	Westchester
	10514	Westchester
	10522	Westchester
	10523	Westchester
	10528	Westchester
	10530	Westchester
	10532	Westchester
	10533	Westchester
	10536	Westchester
	10538	Westchester
	10543	Westchester
	10545	Westchester
	10549	Westchester
	10550	Westchester
	10552	Westchester
	10553	Westchester
	10562	Westchester
	10567	Westchester
	10570	Westchester
	10573	Westchester
	10577	Westchester
	10580	Westchester
	10583	Westchester
	10591	Westchester
	10594	Westchester
	10595	Westchester
	10601	Westchester
	10603	Westchester

	10604	Westchester
	10605	Westchester
	10606	Westchester
	10607	Westchester
	10610	Westchester
	10701	Westchester
	10702	Westchester
	10703	Westchester
	10704	Westchester
	10705	Westchester
	10706	Westchester
	10707	Westchester
	10708	Westchester
	10709	Westchester
	10710	Westchester
	10801	Westchester
	10802	Westchester
	10803	Westchester
	10804	Westchester
	10805	Westchester
Zone 2. Significant	11105	Queens
	11361	Queens
	11426	Queens
	11358	Queens
	11104	Queens
	11103	Queens
	11355	Queens
	11354	Queens
	11101	Queens
	11106	Queens
	11365	Queens
	11357	Queens
	11427	Queens
	11362	Queens
	11356	Queens
	11004	Queens

	11363	Queens
	11423	Queens
	11102	Queens
	11364	Queens
	11001	Queens
	11040	Queens
	11367	Queens
	11366	Queens
	11360	Queens
	11370	Queens
	11377	Queens
	11432	Queens
	11435	Queens
	11359	Queens
	11428	Queens
	11109	Queens
	11415	Queens
	11373	Queens
	11439	Queens
	11374	Queens
	11436	Queens
	11433	Queens
	10029	Manhattan
	10032	Manhattan
	10014	Manhattan
	10025	Manhattan
	10022	Manhattan
	10024	Manhattan
	10009	Manhattan
	10013	Manhattan
	10021	Manhattan
	10002	Manhattan
	10010	Manhattan
	10028	Manhattan
	10033	Manhattan
	10040	Manhattan

	10031	Manhattan
	10034	Manhattan
	10001	Manhattan
	10019	Manhattan
	10023	Manhattan
	10038	Manhattan
	10017	Manhattan
	10016	Manhattan
	10065	Manhattan
	10036	Manhattan
	10012	Manhattan
	10027	Manhattan
	10128	Manhattan
	10003	Manhattan
	10035	Manhattan
	10011	Manhattan
	10026	Manhattan
	10030	Manhattan
	10075	Manhattan
	10006	Manhattan
	10069	Manhattan
	10039	Manhattan
	10007	Manhattan
	10037	Manhattan
	10018	Manhattan
	10004	Manhattan
	10112	Manhattan
	10044	Manhattan
	10282	Manhattan
	10005	Manhattan
	10280	Manhattan
	10281	Manhattan
	10020	Manhattan
	10106	Manhattan
	10111	Manhattan
	10123	Manhattan

	10169	Manhattan
	10152	Manhattan
	10154	Manhattan
	10119	Manhattan
	10104	Manhattan
	10080	Manhattan
	10173	Manhattan
	10115	Manhattan
	10105	Manhattan
	10165	Manhattan
	10122	Manhattan
	10162	Manhattan
	10166	Manhattan
	10041	Manhattan
	10178	Manhattan
	10285	Manhattan
	10118	Manhattan
	10176	Manhattan
	10110	Manhattan
	10167	Manhattan
	10279	Manhattan
	10172	Manhattan
	10045	Manhattan
	10175	Manhattan
	10103	Manhattan
	10271	Manhattan
	10278	Manhattan
	10170	Manhattan
	10174	Manhattan
	10121	Manhattan
	10466	Bronx
	10469	Bronx
	10467	Bronx
	10464	Bronx
	10470	Bronx
	10452	Bronx

	10475	Bronx
	10462	Bronx
	10473	Bronx
	10465	Bronx
	10461	Bronx
	10460	Bronx
	10472	Bronx
	10453	Bronx
	10468	Bronx
	10457	Bronx
	10463	Bronx
	10451	Bronx
	10474	Bronx
	10456	Bronx
	10455	Bronx
	10454	Bronx
	10459	Bronx
	10471	Bronx
	10458	Bronx
Zone 3. Moderate	10547	Westchester
	10533	Westchester
	10514	Westchester
	10523	Westchester
	10577	Westchester
	10603	Westchester
	10601	Westchester
	10532	Westchester
	10573	Westchester
	10604	Westchester
	10703	Westchester
	10605	Westchester
	10607	Westchester
	10520	Westchester
	10548	Westchester
	10606	Westchester
	10511	Westchester

10530	Westchester
10583	Westchester
10535	Westchester
10588	Westchester
10598	Westchester
10595	Westchester
10589	Westchester
10505	Westchester
10550	Westchester
10580	Westchester
10502	Westchester
10707	Westchester
10701	Westchester
10549	Westchester
10710	Westchester
10536	Westchester
10528	Westchester
10594	Westchester
10506	Westchester
10706	Westchester
10801	Westchester
10805	Westchester
10507	Westchester
10504	Westchester
10501	Westchester
10517	Westchester
10526	Westchester
10527	Westchester
10540	Westchester
10596	Westchester

Appendix B: Glossary

Terms applicable to Performance-Based Gas DR Pilot and DLC Pilot

Winter Capability Period – The period between November 1 through March 31.

Customer – Any firm gas customer taking service from Con Edison.

Definitions applicable to the Performance-Based Gas DR Pilot only

Aggregator – A party other than the Company that represents and aggregates the load of Customers who collectively have a Load Relief potential of 50 therms and is responsible for the actions of the Customers it represents, including performance and, as applicable, repayments to the Company.

Capability Period – The period between November 1 through March 31 during which Direct Participants and Aggregators have pledged Load Relief.

Customer Baseline Load ("CBL") – The Customer Baseline Load as calculated under the Company's CBL methodology using the two baseline options listed in the Company's Performance-Based Gas Demand Response Pilot Guidelines. The average day CBL is designed to predict gas consumption ordinarily supplied to customers that is not sensitive to changes resulting from weather variations. The weather adjusted CBL is designed to modify the Average Day CBL for changes in gas consumption that occur as a result of weather variations.

Contracted Hours – Refers to the 24-hour period (10:00 AM to 10:00 AM the following day) during which the Load Relief of Participating Customers will be measured during a Planned Event, Test Event, or Unplanned Event.

Direct Participant – A Customer that enrolls in the Pilot directly for a single Con Edison account, and agrees to provide at least 50 therms of Load Relief.

Enrollment Value – The quantity of Load Relief enrolled by each Participating Customer.

Event Performance Factor – The ratio of (i) the therms of Load Relief provided during a Planned Event or Test Event up to the Enrollment Value, to (ii) the Enrollment Value. The Event Performance Factor is rounded to two decimal places and has an upper limit of 1.00 and a lower limit of 0.00. The Event Performance Factor is calculated for each participating Customer.

Interval Meter – A gas meter capable of measuring gas consumption on a one-hour basis.

Load Relief – Net reduction in gas consumption (measured in therms) ordinarily supplied by the

Company at the Participating Customer's premise during the entirety of the Contracted Hours.

Load Relief Verification Methodology – The methodology used by the Company to verify the actual Load Relief provided during Planned Events, Test Events, and Unplanned Events. Metered gas consumption levels are compared to the CBL to verify whether the Participating Customer provided the contracted Load Relief. The Company reserves the right to estimate data if they are not available for all the intervals required by the methodology.

Monthly Performance Factor – The average Event Performance Factor from all Planned Events and Test Events called during the month. The Monthly Performance Factor is rounded to two decimal places and has an upper limit of 1.00 and a lower limit of 0.00.

Participating Customer – A Con Edison Customer who satisfies the eligibility and metering requirements set forth in the Implementation Plan, and who participates in the Pilot through an Aggregator or as a Direct Participant.

Performance Payment – An incentive for Participating Customers in the Performance-Based Pilot based on their Load Relief during Planned Events, Test Events, and Unplanned Events.

Reservation Payment – A monthly incentive under the Reservation Payment Option in the Performance-Based Pilot. Reservation Payments are based on each Participating Customer's Enrollment Value, after adjusting for the Monthly Performance Factor, for each month of the Capability Period that the Participating Customer is enrolled in the Pilot.

Reservation Payment Option – Participation option for the Performance Based Pilot in which Direct Participants and Aggregators are eligible for both a Reservation Payment and Performance Payment.

Definition applicable to the DLC Gas DR Pilot only

Snapback - Snapback is the increase in energy use in the hours immediately following a demand response event, which may offset the savings achieved during the event.