Gas Demand Response Pilot Implementation Plan, 2018-2021

Consolidated Edison Company of New York, Inc.
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Case 17-G-0606

Contents

1 Executive Summary

Consolidated Edison Company of New York, Inc. ("Con Edison" or "the Company") proposed the Smart Solutions for Natural Gas Customers Program ("Smart Solutions")[1] to address increased demand for natural gas in its service territory and limited pipeline capacity. This innovative, integrated, multi-solution proposal seeks to decrease gas usage and procure alternative resources to meet customer heating and other thermal needs. As part of the Smart Solutions portfolio and pursuant to the New York Public Service Commission's ("PSC") Order,[2] Con Edison established a Gas Demand Response ("DR") Pilot ("Gas DR Pilot" or "Pilot") that aims to reduce net customer gas demand during the entirety of a peak gas demand day during the coldest winter days.

Gas DR has been piloted between November 1, 2018 through March 31, 2019 (the "2018/19 Winter Capability Period") and will continue for the period between November 1, 2019 through March 31, 2020 (the "2019/20 Winter Capability Period') and the period of November 1, 2020 through March 31, 2021 (the "2020/21 Winter Capability Period") in certain zones in Con Edison's service territory, with a prescribed limit for the number of customers who are eligible participate. The designation of this effort as a Pilot and the limit on the number of participating customers are necessary due to the limited experience with gas DR in Con Edison's service territory as well as New York State and nationally. Con Edison intends to use this Pilot to gather insight into optimal gas DR operational parameters and achievable customer response that will potentially inform a tariffed program to be proposed at the end of the Pilot, if appropriate.

This Implementation Plan outlines the key parameters of the Gas DR Pilot, which consists of a Performance-Based Gas DR Pilot primarily targeting Con Edison's commercial and industrial ("C&I") gas customers and multi-family buildings with centralized heating systems, and a Direct Load Control ("DLC") Gas DR Pilot targeting Con Edison's residential gas customers.

The Company developed the Gas DR Pilot parameters by leveraging interviews and discussions with Con Edison's largest gas customers, as well as aggregators and solution providers that are active in the electric DR space in New York State. The Pilot has been designed to account for customer capabilities, while providing sufficient economic incentive to customers for participation. Where possible, Con Edison has leveraged many of the existing capabilities and procedures from its electric DR programs in the design of the Gas DR Pilot, with the ultimate goal of making Gas DR Pilot participation attractive for existing electric DR customers (who are often also gas customers) and aggregators.

The Company has received authorization for $5.051 million to support the costs of the Gas DR Pilot over a three-year period. The Company intends to reallocate financial resources within the various components of the Gas DR Pilot as needed as authorized by the PSC. If incentive costs are higher than anticipated, the Company will petition the Commission for additional funding.

Following the submission of this updated Implementation Plan, Con Edison will continue preparing the administrative functions that will enable the continuation of the program in time for the 2019/20 Winter

[1] Case No. 17-G-0606, *Petition of Consolidated Company of New York, Inc. for Approval of the Smart Solutions for Natural Gas Customers Program* (filed September 29, 2017).
[2] Case No. 17-G-0606, New York State Public Service Commission, *Order Approving With Modification Gas Demand Response Pilot* (effective August 9, 2018).

Capability Period. During the period of the Pilot, Con Edison will continue engaging customers and the market, and will provide regular updates to New York State Department of Public Service Staff ("Staff") and respond to any Staff concerns and recommendations.

2 Introduction

2.1 Background to the Gas DR Pilot

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. Con Edison must have sufficient pipeline capacity available to meet its customers' demand on a peak design day. The design day customer demand only reflects gas used by firm gas customers, and does not include, for example, the gas supply needs of customers taking interruptible delivery service or electric generating stations; to the extent interruptible customers require fuel on the coldest days of the year, they are required to use an alternate fuel.

Natural gas use in Con Edison's service territory has grown substantially in recent years, and this upward trend is expected to continue for the foreseeable future. There are multiple drivers for growth in natural gas load: customers converting to natural gas for its local environmental benefits, community clean heat programs which require customers to switch from residual heating oil to other cleaner heating fuels, and the value proposition of natural gas including reliability of supply, convenience and (depending on the comparative price of alternative fuels) cost savings.

On the supply side, pipeline capacity coming into Con Edison's service territory is fully contracted, and proposals for new pipeline projects have recently encountered increased difficulty in securing necessary preconstruction permits.

To address the increased customer demand and limited pipeline capacity, Con Edison has proposed the Smart Solutions for Natural Gas Customers Program.[3] This innovative, integrated, multi-solution strategy seeks to decrease gas usage and procure alternative resources to meet customer heating and other thermal needs. The Smart Solutions Program is designed to develop alternative means to meet customers' heating and other thermal needs cost-effectively, seek to defer the Company's requirement for incremental upstream pipeline capacity, reduce the use of pipeline delivered services, mitigate the need for a moratorium on new gas customer interconnections, and contribute to the achievement of State and local environmental goals.

The Smart Solutions proposal includes four non-traditional solutions to address customer gas needs:

- Developing the Gas DR Pilot to reduce net customer demand during the entirety of a peak gas demand day;
- Doubling of the Company's existing gas energy efficiency program;
- Creating a gas innovation program for renewable alternatives to natural gas heating (request for information issued in Q2 2018); and
- Issuing a market solicitation for additional non-pipeline solutions on either the supply or demand side, which will provide a pathway for the advancement of new technologies and

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

facilitate new abilities to engage with and deliver services to customers; examples include beneficial electrification of heating and localized natural gas storage alternatives (a request for proposals was issued on December 15, 2017).

Con Edison launched a Gas DR Pilot for the 2018/19 Winter Capability Period consisting of (1) a Performance-Based Gas DR Pilot targeting Con Edison's C&I customers and multi-family buildings with centralized heating systems, and (2) a DLC Gas DR Pilot targeting Con Edison's residential customers.

This Implementation Plan describes the characteristics of the Gas DR Pilot, as informed by Con Edison's operational requirements, and the capabilities of Con Edison's customers and the market using smart thermostat technology.

2.2 Gas DR 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 (from 10:00am to 10:00am the following day) on the coldest days of the winter.

The overall goals of the Gas DR Pilot are to:

- Understand the magnitude of net load reduction that customers are able to provide following notification over a 24-hour window from 10:00 am to 10:00 am the following day (an "event");
- Test customer engagement as measured by 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 events (i.e., when events occur consecutively over multiple days) and events on holidays;
- Collect information on successful customer gas use reduction strategies;
- Inform the process of setting program incentive levels;
- Test baseline methodologies for robustness; 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.

The Gas DR Pilot was offered initially in the 2018/2019 Winter Capability Season and will continue being offered through the 2019/20 and 2020/2021 Winter Capability Seasons. Con Edison has evaluated the results of the 2018/19 Winter Capability Season and will continue to evaluate the results of the Gas DR Pilot after each Winter Capability period to determine if it should be established as a full program, as well as the optimal program parameters.

2.3 Stakeholder Engagement

To support the development of the Gas DR Pilot and this Implementation Plan, Con Edison actively engaged external stakeholders to collect input that informed Pilot design. Specifically, Con Edison:

- **Conducted interviews** in early 2018 with seven natural gas customers spanning a range of building types, technology types, and customer segments to discuss the Gas DR Pilot concept, the customers' technical capabilities, program design attributes, potential barriers to participation, and key insights into how Con Edison could design the Gas DR Pilot;
- **Conducted interviews** with interested third-parties including aggregators as well as building management system and energy management system ("BMS/EMS") providers to understand their capabilities to contribute to the Gas DR Pilot;
- **Presented in the Demand Response Forum** on February 27, 2018 the initial outline of the Gas DR Pilot to a broad group of stakeholders currently active in Con Edison's electric DR programs;
- **Collected feedback in a Gas DR Pilot Design Workshop** on April 2, 2018 from customers, aggregators, and other local stakeholders on the preliminary design elements of the Gas DR Pilot, with an open comment period following the workshop for stakeholders to provide additional input; and
- **Tested DLC capability** with a limited effort to test the ability and willingness of customers who have already installed a specific brand of smart thermostat to participate in a DLC-type Gas DR Pilot.
- **Conducted a Gas Demand Response Forum** on June 26, 2019. The 2018/19 Winter Capability results and proposed changes to the Pilot were reviewed in an open meeting with stakeholders.

Con Edison will continue to engage with stakeholders throughout the duration of the Gas DR Pilot to collect further feedback as both customers and aggregators learn and gain experience from their participation in the Gas DR Pilot.

3 Summary of Changes since the 2018/19 Winter Capability Period

We outline below any changes to this Implementation Plan since it was originally filed prior to the 2018/19 Winter Capability Period. Each of the changes below is further elaborated in the appropriate section of this document.

1. Added a minimum enrollment requirement in section 4.1 Eligibility. Specifically, 4.1: All participating customers must enroll for a minimum of one dekatherm if participating with a volume corrector or a BMS systems connected to a volume corrector.
2. Added in section 4.2 Operational Parameters the following: "Starting with the 2019/20 Winter Capability Period, Con Edison reserves the right to impose and enforce a one-year ban on participation in the Gas DR Pilot for any customer that is found to have utilized fuel switching to fuel oil or liquid fuels as a reduction strategy. Participants that are identified to have potentially switched to fuel oil or liquid fuels will have their performance put under administrative review, per the Pilot's guidelines. Participants that are confirmed to have switched to fuel oil or liquid fuels will be disqualified from receiving any incentive payments for the entirety of the Winter Capability Period that the violation occurred in, and will be ineligible to participate during the following Winter Capability Period."
3. Updated section 4.3.3 Measurement and Verification to reflect changes to the Weather-Sensitive adjustment in the Pilot's CBL procedure.
4. Added the following requirement in section 4.3.3 Measurement and Verification as a result of the implementation of the new CBL procedure: "The Company reserves the right to require participants who elect the Weather-Sensitive adjustment to demonstrate Weather-Sensitive load upon making the CBL selection or at any point during the Capability Period."

4 Performance-Based Gas DR Pilot Description

4.1 Eligibility

For the Performance-Based Gas DR Pilot, Con Edison will enroll customers that express interest in the Performance-Based Gas DR Pilot and meet the following eligibility criteria:

- **Firm service:** Customers must take firm gas delivery service. If a customer switched to firm gas delivery service from interruptible delivery service, or if the customer moved to firm delivery service as a result of failure to meet interruptible delivery service requirements, the customer must take firm delivery service for a full calendar year before being eligible to enroll in the Performance-Based Gas DR Pilot.
- **Minimum enrollment value:** Both aggregators and direct participants will be required to provide a minimum enrollment value of five dekatherms of Net Load Relief per gas day. Customers may enroll through a qualified aggregator or as a direct participant, provided that customers enrolled as a direct participant provide the minimum enrollment value. In addition, all participating customers must enroll for a minimum of 1 dekatherm if the customer is participating with a volume corrector or a BMS systems connected to a volume corrector.
- **Customer segments:** While all customer segments will be eligible to participate, the primary focus is on C&I gas customers and multi-family buildings with centralized gas heating systems. Dual enrollment in the Performance-Based Gas DR Pilot and the DLC Gas DR Pilot will not be allowed.
- **Building end uses:** The Performance-Based Gas DR Pilot will primarily target natural gas consumption from space heating, water heating, combined heat and power ("CHP") systems, and process loads.
- **Reduction strategies:** Customers will have the option to participate through either curtailing gas consumption or reducing gas usage by fuel-switching to electric during the event days. Fuel-switching to liquid fuels will not be permitted.
- **Metering requirements:** Customers will be required to have at least one of the four metering options outlined in Section 4.3.1 for the collection of interval data.
- **Locations:** The Performance-Based Gas DR Pilot will be offered to customers in portions of the Con Edison gas service territory where reducing peak day gas usage would mitigate pipeline needs and/or reduce the Company's use of pipeline delivered services. The Performance-Based Gas DR Pilot incentives are based on two value zones that are identified by zip code: Zone A (higher tier) and Zone B (lower tier). Section 4.3.4 provides details on customer incentives by zone, and Appendix A includes a table of the zip codes within each zone, as well as the zip codes that are ineligible to participate in the Performance-Based Gas DR Pilot.
- **Enrollment limit:** Enrollment in the Performance-Based Gas DR Pilot was limited to 500 customers in the 2018/19 Winter Capability Period), 750 customers in the 2019/20 Winter Capability Period, and 1,000 customers in the 2020/21 Winter Capability Period).

4.2 Operational Parameters

Table 1 summarizes the key parameters for the Performance-Based Gas DR Pilot, based on the operational requirements presented in Section 4.1, as well as customer and market capabilities.

Table 1. Summary of Performance-Based Gas DR Pilot Parameters

Parameter	Definition
Event Trigger	• The event trigger will be based on a forecasted average daily temperature at the Central Park weather station as forecasted by Con Edison 24 hours in advance of the event day (which, as noted below, begins at 10:00am). • For the 2018/19 Winter Capability Period, the trigger will be 18°F. The event trigger may be reassessed prior to each season. • Con Edison will have the right to call events based on the forecasted Event Trigger, but is not obligated to call an event.
Frequency of Events	• Based on previous 10 years of weather data, Con Edison projects an average of 3-4 events per season for the 2018/19 Winter Capability Period event trigger of 18°F. • Con Edison may call one or more Test Events per season, depending on the frequency of Planned Events.
Capability Period	• November 1 through March 31.
Contracted Hours	• 24-hour period (10:00 am to 10:00 am the following day), 7 days a week (weekdays, weekends, and holidays), during the Capability Period.*
Notification Time	• An advisory notification will be provided to participants at least 21 hours in advance of the event. An activation/cancellation notification will be sent at least two hours in advance of the event.
Net Load Relief	• The key benefit to Con Edison's gas system is the load relief achieved during a 24-hour event period, compared to the customer's forecasted usage ("Net Load Relief").
Event Participation	• Customers and/or aggregators are responsible for their participation strategy on gas DR event days. • Con Edison will not have direct control of customer appliances, controls, or other equipment. **
Prohibited Reduction Modes	• 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 allowed.***

* 10 out of the 20 top send-out days over the last 4 years occurred during holiday and/or weekend days. Events occurring on Thanksgiving Day, Christmas Day, and New Year's Day holidays will receive higher incentive payments (see Section 4.3.4).

** Customers who own or manage multi-family residential buildings in New York City must meet New York City code requirements for space heating and water heating temperature settings for tenant spaces, where applicable, regardless of their participation in a gas DR event.[4]

*** Participation in the Performance-Based Gas DR Pilot does not limit or modify customer requirements to abide by all environmental laws or regulations limiting emissions of various pollutants, including during participation in a DR event. Con Edison reserves the right to confirm after a DR event that a participating customer did not engage in a Prohibited Reduction Mode. Starting with the 2019/20 Winter Capability Period, Con Edison reserves the right to impose and enforce a one-year ban

[4] Current New York City code requires 68°F from 6:00am to 10:00pm, and 62°F 10:00 pm to 6:00 am, and 120°F water at the tap. NYC Housing Prevention and Development. "Heat and Hot Water." Accessed January 2018. Available at: http://www1.nyc.gov/site/hpd/renters/important-safety-issues-heat-hot-water.page

on participation in the Gas DR Pilot for any customer that is found to have utilized fuel switching to fuel oil or liquid fuels as a reduction strategy. Participants that are identified to have potentially switched to fuel oil or liquid fuels will have their performance put under administrative review, per the Pilot's guidelines. Participants that are confirmed to have switched to fuel oil or liquid fuels will be disqualified from receiving any incentive payments for the entirety of the Winter Capability Period that the violation occurred in, and will be ineligible to participate during the following Winter Capability Period.

4.3 Delivery Parameters and Procedures

4.3.1 Customer Enrollment and Metering Enablement

Customers enrolled by October 1 will be able to participate in the Performance-Based Gas DR Pilot beginning November 1. Customers who miss the October 1 enrollment deadline can enroll by November 1 for participation in the Pilot beginning December 1.

Con Edison must be able to collect and record hourly gas usage interval data on a daily basis for all Performance-Based Gas DR Pilot participants. Because the rollout of gas AMI meters will be limited during the initial years of the Performance-Based Gas DR Pilot, Con Edison will utilize one of four different metering options for the collection of interval data:

1. Con Edison will use AMI meters for data collection where the customer has already had an AMI gas meter installed and the AMI communications network is actively collecting data from the customer's AMI gas meter.
2. Con Edison will allow customers using a customer-owned interval data recording device, such as a BMS, EMS or other recording device capable of collecting hourly interval data from their existing Con Edison gas meter to use such systems for data collection and submit the data directly to Con Edison in a pre-established format.
3. Con Edison will retrieve data from customers without AMI meters or customer-owned interval data recording devices, but whose meters have volume correctors that record and store data, via a physical meter read either on a monthly basis or at the end of the winter season (depending on the volume corrector data capacity).
4. For other customers without AMI meters, customer- owned interval data recording devices, or volume correctors, customers can request to have their gas meters upgraded with an AMI IMU that will be installed by Con Edison, and agree to enroll in the Performance-Based Gas DR Pilot. Con Edison will collect the data via a physical meter read on a monthly basis.

Hourly interval data collected or provided to the Company under Options 2, 3, and 4 will not be used for normal bill calculations, but will only be utilized by the Company for the purposes of establishing a participating customer's DR baseline and the customer's performance during a Planned Event or Test Event.

The process for establishing metering capabilities and collecting the interval data for participating customers is the following:

- Customer requests to participate in the Performance-Based Gas DR Pilot,
- Con Edison confirms existing meter configuration and determines which of the four metering options the customer can use to participate in the Performance-Based Gas DR Pilot,
- For Option 3, Con Edison arranges data collection from the customer meter, and
- For Option 4, Con Edison arranges for installation of IMU retrofit unit at Con Edison's own cost, and arranges for data collection from the customer meter.

Customer data collected using customer-owned interval data recording devices (Option 2) will be

subject to measurement and verification spot checks by Con Edison. If feasible, for customers with an existing customer-owned interval data recording device, Con Edison will attempt to install an IMU, thereby allowing them to participate in the Performance-Based Gas DR Pilot under Option 4.

A maximum of 150 customers can enroll in Option 3 and a maximum of 150 customers can enroll in Option 4 every year. In order to be eligible for the meter retrofit and additional meter reading associated with either Options 3 or 4, participants must have monthly usage of at least 400 dekatherms in at least one month during the winter 2017/2018 heating season.

If a customer enrolled in Option 4 does not provide Con Edison with access to the customer's site during the visit for the installation of the IMU retrofit unit, the customer will be ineligible to participate in the Pilot for the remainder of the season. If a customer enrolled in any of the four options does not provide Con Edison with access to the customer's site for collection of data during the season at Con Edison's request, the customer will receive a zero Performance Factor (as defined in Section 4.3.4) for each month that access is not available.

4.3.2 Event Notification

As outlined in the Performance-Based Gas DR Pilot operational parameters (see Section 4.2), Con Edison will have the option, but not the obligation, of calling an event when the forecasted average daily temperature is 18°F or below based on the average hourly temperature at the Central Park weather station as forecasted by Con Edison 24 hours in advance of the event day.

Notifications for the Performance-Based Gas DR Pilot events will be sent via phone or email to aggregators and direct participants. Advisory notifications will be issued 21 or more hours in advance of the event. Activation/cancellation notifications will be issued two or more hours in advance of the event.

Con Edison will also have the option, but not the obligation, of calling one or more Test Events, in which it requests that direct participants and aggregators provide of Net Load Relief over a 24 hour period in order to test participants' response to a request for load relief. Test Event notifications will be issued 21 or more hours in advance of the event. Advisory/cancellation notifications will be issued two or more hours in advance of the event. Performance payments for Test Events will be made for the Net Load Relief achieved up to the customer's enrollment value.

4.3.3 Measurement and Verification

To measure the customers' baseline usage for determining gas savings on an event day, Con Edison will apply an adapted version of the Customer Baseline Load ("CBL") procedure that is currently used for Con Edison's electric DR programs. Similar to electric DR, determining the proper baseline will be critical to calculating the value provided by the Performance-Based Gas DR Pilot, as gas DR event days will be associated with the coldest periods with highest gas use, and would normally see an increase in gas consumption.

Key features of the Performance-Based Gas DR Pilot CBL include the following:

- CBL Basis and CBL Window[5] defined as:
    - Weekday events: Highest 5 of 10 previous weekdays.
    - Saturday events: Highest 2 of 3 previous Saturdays.
    - Sunday events: Highest 2 of 3 previous Sundays.
    - Holiday events: Highest 2 of 3 previous Sundays.
- CBL Window excludes the following:
    - Day before the event,
    - Other event days (for weekday events),
    - Holidays (for weekday events), and
    - Low usage days with average daily event period usage less than 25 percent of the average event period usage level.
- Average Day CBL is the average of the total daily usage for the days that comprise the CBL Basis (e.g., the CBL for a weekday event will be a single daily value representing the average of the daily usage for the highest 5 of 10 previous weekdays).[6]
- A Weather-Sensitive adjustment option will be available, in which the Average Day CBL is adjusted to account for the difference in temperature between the event day and the CBL Basis.
- For consecutive weekday events, the CBL Basis of the first event day will be used for each of the consecutive weekday events.
- At the initial enrollment in the Performance-Based Gas DR Pilot, participants may elect either the Average Day CBL or the Weather-Sensitive adjustment CBL formula.
- The Company reserves the right to require participants who elect the Weather-Sensitive adjustment to demonstrate weather-sensitive load upon making the CBL selection or at any point during the Capability Period.

The development of a baseline methodology for a 24-hour DR event period is a novel practice in the industry and is based on limited data for historical customer hourly and daily gas usage. Con Edison intends to test the CBL methodology through the Gas DR Pilot implementation, and will re-analyze and potentially revise the CBL methodology during or immediately after the Gas DR Pilot is complete based on the results of the Gas DR Pilot. If, during the course of the Pilot, Con Edison determines that revisions to the CBL are necessary, it will convene a stakeholder session to discuss modifications.

The full procedure for the determination of the customer baseline will be posted on Con Edison's website in a separate document for participant reference.

4.3.4 Incentives and Settlement

[5] The CBL Window is the set of days that will serve as representative of participant's typical usage. The CBL Basis is the set of days within the CBL Window to be used to develop CBL values for the event.

[6] The Performance-Based Gas DR Pilot CBL will be based on the net usage over the event day, as opposed to the methodology used for the electric DR CBL, which is based on the average of the hourly usage in each hour of the event window.

Customers will be eligible for a reservation payment and performance payment based on their participation in DR events for the Performance-Based Gas DR Pilot throughout the five month Capability Period (November 1 through March 31). Incentive payments will be made at the end of the season based on net 24-hour therm reductions below that customer's CBL during event days (therm-day).

Table 2 highlights the proposed incentive levels for participating customers in each value zone.[7]

- **Reservation Payment ($/therm-day per month):** A monthly incentive for customers based on their commitment during the capability period to provide Net Load Relief ("enrollment value"). Reservation incentives are based on each customer's enrollment value, after adjusting for the Monthly Performance Factor (discussed below), for each month of the Capability Period the customer is enrolled. The Reservation Payment per month is equal to the applicable Reservation Payment Rate per therm per month multiplied by the participating customer's therm of contracted Load Relief multiplied by the Performance Factor for the month.
- **Performance Payment ($/therm-day per event):** A daily incentive for customers based on their Net Load Relief during each event. Performance incentives are determined by measured net 24-hour therm reduction below that customer's CBL during each event day.
- **Higher Performance Payment ($/therm-day per event):** An additional daily incentive for customers based on their Net Load Relief during events that occur on three specified holidays (Thanksgiving Day, Christmas Day, or New Year's Day) or events over three or more consecutive event days (with the higher performance payment starting on the third consecutive event day).
- **Voluntary Performance Payment ($/therm-day per event):** A daily incentive for customers to provide Net Load Relief during certain events that are not subject to the Reservation Payment:
    - Events called with shorter notice than the 21-hour standard event notice,
    - Events called at temperatures higher than 18°F trigger, or
    - Responses to event notifications by customers who enroll after the enrollment deadline and are therefore not eligible for reservation payments.
- **Event Performance Factor**: The Event Performance Factor is the ratio of (i) the dekatherms of Net Load Relief provided during a Planned Event or Test Event up to the dekatherms of contracted Net Load Relief to (ii) the dekatherms of contracted Net Load Relief.
- **Monthly Performance Factor**: A Monthly Performance Factor will be applied to the reservation payment for each month of the season and will be based on the average Event Performance Factor from all Planned Events or Test Events called during the month. The Monthly Performance Factor for the month is used to calculate the Reservation Payment for that month and each month thereafter until the month in which the next Test Event or Load Relief Period is called by the Company for that account during the current Capability Period. The Monthly Performance Factor determined for the first month in which a Load Relief Period or Test Event is called for an account during a Capability Period will be applied retroactively starting with the first month the customer was enrolled during the Capability Period.

[7] Appendix A provides details on the value zones, including ineligible service areas.

Table 2. Proposed 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

Section 4.1 and Appendix A provide details on eligible and ineligible zones.

Con Edison designed the Performance-Based Gas DR Pilot's incentives to offer meaningful compensation to participating customers, while achieving a BCA value of greater than 1.0 (see section 6.2).

The proposed incentive levels were developed using a number of reference points:

- Program BCA thresholds for the Smart Solutions portfolio,
- Electric DR incentive expectations from the 2015 Willingness-to-Accept study,[8]
- Published incentive levels in National Grid (KED-NY and KED-LI) Gas DR Pilot,
- The relative value to a customer of current electric DR program incentives as compared to a customer's annual bill, and
- Other commercial information on the value of gas DR available to Con Edison.

Customers will be paid for the entirety of the Performance-Based Gas DR Pilot season in a single payment at the end of the season.

4.3.5 Marketing, Outreach, and Customer Engagement

Given the nascence of gas DR in Con Edison's service territory, customer education will be a critical part of the initial marketing efforts to help customers understand the objectives of the Performance-Based Gas DR Pilot and the mechanisms for participating. Overall, the marketing strategy will be similar to that of the electric DR program, with additional emphasis on education in the first two years of the Performance-Based Gas DR Pilot. Con Edison expects to cross-market the Performance-Based Gas DR

[8] Navigant Consulting, Inc. 2015. "Demand Response Survey Research Study – Commercial Demand Response Willingness-to-Accept and Performance Window Customer Research." Prepared for CECONY. January 30, 2015.

Pilot with its electric DR programs, particularly in the initial pilot years, to reach customers who have already expressed interest in electric DR participation.

Marketing will be delivered primarily through aggregators, with limited targeted marketing delivered directly by Con Edison to larger C&I customers. The targeted marketing delivered directly by Con Edison will include informational webinars that will be open to the general public and email campaigns.

To support the marketing and outreach efforts more broadly, Con Edison will prepare marketing collateral that can be used to educate customers on the Performance-Based Gas DR Pilot, Pilot Guidelines to help participants better understand the rules and processes, and a web page on Con Edison's website with information on the Performance-Based Gas DR Pilot with a link to Con Edison's DR email address for further questions and direct engagement.

4.4 Additional Guidelines and Procedures

In order to facilitate access to resources relating to the Performance-Based Gas DR Pilot, Con Edison will develop a webpage that will provide additional details on the CBL procedure and the Performance-Based Gas DR Pilot rules and guidelines.

5 DLC Gas DR Pilot Description

The DLC program is the current residential and small commercial component of Con Edison's electric DR offerings. The DLC program supports electric system reliability primarily by using Wi-Fi enabled thermostats (Smart Thermostats) to control participants' central air conditioning units and reduce energy demand at times of critical system need. These customers have the ability to remotely control their central air conditioning units online through a personal computer or mobile device at all times, and thus can override events called by Con Edison regardless of the customers' location. The DLC program has been offered in Con Edison's service territory since 2002. In alignment with the principles in the Reforming the Energy Vision ("REV") proceeding, since 2014, the Company has offered customers a Bring Your Own Thermostat ("BYOT") option that allows customers to enroll a thermostat through certain service providers or thermostat manufacturers.

Con Edison proposes a similar BYOT DR option for natural gas customers to reduce gas usage at peak times during November 1 through March 31. Customers will participate in the DLC Gas DR Pilot through the BYOT option by providing their own control device and enrolling in the DLC Gas DR Pilot through a service provider (i.e., smart thermostat manufacturers and/or aggregators). Through the DLC Gas DR Pilot, Con Edison will target customers who have previously enrolled in the electric DLC program, as well as new customers who have eligible Wi-Fi thermostats. Service providers that currently participate in the electric DLC program will be eligible, and encouraged, to participate in the DLC Gas DR Pilot as well.

The current DLC BYOT option allows customers to enroll a thermostat through service providers and to receive a one-time sign-up bonus. Customers who currently participate in the DLC program during the summer months and have a gas heating system will receive an additional incentive to enroll in the DLC Gas DR Pilot. New customers who have a gas heating system but have not previously registered for the DLC program will receive a sign-up payment at the time of enrollment.

Under the DLC program, there is a sign-up bonus of $85 per thermostat and an additional $25 payment for participation in DR events after Con Edison can verify participation in at least 50 percent of events in the first three summers. The DLC Gas DR Pilot may choose to apply a similar incentive structure to the pilot year, or opt to test multiple incentive methods to increase pilot participation.

5.1 DLC Gas DR Pilot Parameters

The DLC Gas DR Pilot seeks to enroll up to 1,000 participating customers by 2021. The proposed budget (see Table 4) includes incentive payments for customers and service providers, marketing for DLC Gas DR Pilot enrollment, set up fees and administrative costs.

5.1.1 Goals

The DLC Gas DR Pilot seeks to test and understand the impact of various parameters to help inform the feasibility and design of an effective program at the end of the pilot period. The pilot intends to test following parameters:

- Duration of events
- Call window (i.e., time of day when events are called)
- Amount of temperature setback

The focus of the testing will be to determine the impact on the following:

- Magnitude of therm savings
- Snapback, i.e., any increase in usage during the gas day but outside of the event period
- Customer overrides and opt-outs

Testing the parameters will be done by splitting participants into groups and applying different parameters to different groups during events, as well as applying different parameters on different event days. The total amount of testing that will be done will depend on the number of participants and the number of events during each season.

In addition, if the initial incentive structure and incentive values (as described below) prove to be insufficient to attract and maintain participants, Con Edison may modify the incentives, which will provide additional information regarding the relationship between incentive levels and customer participation.

5.1.2 Operational Parameters

The operational parameters of the DLC Gas DR Pilot, described below in Table 3, generally mirror the Performance-Based Gas DR Pilot, with some modifications due to the different nature of the pilots, and the testing described above for the DLC Gas DR Pilot.

Table 3 DLC Gas DR Operational Parameters

Parameter	Definition
Event Trigger	• The event trigger will be based on a forecasted average daily temperature at the Central Park weather station as forecasted by Con Edison 24 hours in advance of the event day (beginning at 10 a.m.). • For the 2018/19 Winter Capability Period, the trigger was be 18°F. The event trigger may be reassessed prior to each winter season. • Con Edison will have the right to call events based on the forecasted Event Trigger, but is not obligated to call an event.
Frequency of Events	• Based on previous 10 years of weather data, Con Edison projects an average of 3-4 events per season for the 2018/19 event trigger of 18°F. • In the 2018/19 Winter Capability Period, there were 3 events, January 21, January 30, and January 31. • Con Edison may call one or more Test Events per season, based on the frequency of actual events. The duration and event times of a Test Event will be similar to the duration and event times of an actual event. • In the 2018/19 Winter Capability Period, 2 test events were conducted to retrieve operational data on February 27 and March 6, due to technical issues that prevented the successful dispatch of the January 21 and January 31 events.
Capability Period	• November 1 through March 31. • Events may be called on any day of the capability period.

Parameter	Definition
Event Duration	• Con Edison will seek to test the effectiveness of different event durations ranging from 2 – 8 hours. The initial focus will be on 4 and 6 hour durations, with other durations added in if there is the opportunity for additional testing based on the population size and number of events.
Event times	• Con Edison will seek to test the effectiveness of different event times (i.e., start hour of event). All events will take place between 7 am and midnight. The first set of start times to be tested will be 10 am, 4 pm, and 8 pm. Additional start times may be tested if there is the opportunity for additional testing based on the population size and number of events.

It should be noted that despite the fact that the triggers for the Performance-Based Gas DR Pilot and DLC Gas DR Pilot are the same, Con Edison may elect not to call them at the same time based on the frequency of events. Con Edison may also elect to have a different number of Test Events and conduct Test Events at different times for the two pilots since different parameters are being tested by the two pilots (e.g., the DLC Gas DR Pilot is testing the snapback effect and customers' propensity to override events).

5.1.3 Incentives

The DLC Gas DR Pilot will offer an $85 enrollment incentive per thermostat for customers who have not participated in the electric DLC program. Customers who are enrolled in the electric DLC program will receive an additional $20 enrollment incentive per thermostat for enrolling in the DLC Gas DR Pilot. Con Edison may adjust the DLC Gas DR Pilot incentive rates as appropriate.

5.1.4 Participating Service Providers

The Company is working with Nest and Resideo (formerly Whisker Labs), which currently supports enrollment of Honeywell thermostats.

6 Gas DR Pilot Budget

6.1 Budget Breakdown

6.1.1 Overview

This section outlines the budget for the delivery and administration of the Gas DR Pilot for three years (November 2018 to March 2021), including both the Performance-Based Gas DR Pilot and the DLC Gas DR Pilot.

Budget amounts are based on estimates of adoption within Con Edison's customer base. Con Edison will inform Staff of any material revisions to the Gas DR Pilot that are the result of customer participation that is different to what is expected, and to comply with all requirements set forth in any relevant Commission Order(s) issued under Smart Solutions.

Table 4 provides a summary of the estimated budget for the delivery of the Gas DR Pilot for the first three years of operation. Con Edison has estimated the budget on an annual basis; however, the Company will optimize expenditures based on the requirements of the Gas DR Pilot.

Table 4 Gas DR Pilot Budget, 2018-2021

Category	2018-19	2019-20	2020-21	Total
Meter Data Collection	$269,000	$155,000	$155,000	**$579,000**
Customer Incentives	$648,000	$968,000	$1,286,000	**$2,902,000**
Pilot Administration	$490,000	$540,000	$540,000	**$1,570,000**
Gas Pilots Budget	**$1,407,000**	**$1,663,000**	**$1,981,000**	**$5,051,000**

The estimates for Customer Incentives costs in the Gas DR Pilot Budget of approximately $2.9 million for the three-year Pilot period are premised on a number of factors which are outside of the Company's control. For example, while the Gas DR Pilot proposes to limit the total number of customers that can participate in the Performance-Based Gas DR Pilot, the Company has not placed any limit on the amount of reduction each customer or aggregator can enroll in the Pilot. If peak day gas reductions by customers are greater than the amount the Company has anticipated, Customer Incentives costs will be greater than estimated.

As a result of this uncertainty, if incentive costs are projected to be higher than anticipated, the Company will petition for additional funding.

6.1.2 Meter Data Collection

Section 4.3.1 describes 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 that are not equipped with gas AMI meters or customer owned interval data recording devices.

The level of expenditure that will be required for data collection by Con Edison will ultimately be determined by the level of participation in the Performance-Based Gas DR Pilot. Based on expected levels of participation, Con Edison estimates that over the course of the first three years the Performance-Based Gas DR Pilot will require **$0.58 million** for meter readings and incremental hardware, such as Field Service Units ("FSU"). Incremental costs for IMUs that are installed under metering Option 4 will be funded by Con Edison through its existing budget for gas AMI meter installation.

6.1.3 Customer Incentives

Section 4.3.4 describes the incentive strategy for the Performance-Based Gas DR Pilot, and Section 5.1.3 outlines the incentive strategy for the DLC Gas DR Pilot. The level of expenditure for customer incentives will ultimately be determined by the level of participation in the Gas DR Pilot, as well as the number of events being called each year. Based on expected levels of participation in the Gas DR Pilot, and an average number of events per year based on historical weather data, Con Edison estimates that customer incentives over the course of the first three years will amount to **$2.90 million**.

6.1.4 Gas DR Pilot Administration

Gas DR Pilot administration costs include expenditures that relate to the establishment and day-to-day delivery of the Gas DR Pilot, and are beyond the costs of meter data collection and customer incentives. This budget includes costs for the incremental staff that will be responsible for the management of the Gas DR Pilot, incremental marketing, outreach, and other customer engagement activities, market research efforts, settlement processes, and demand response management system ("DRMS") integration.

Pilot administration costs for the first three years of the Gas DR Pilot are estimated at **$1.57 million**.

6.2 Benefit-Cost Analysis

Con Edison has developed a Gas BCA Framework to provide a common methodology for calculating benefits and costs of projects and investments related to gas demand reductions and/or local supply-side additions. A program or portfolio is considered to be cost-effective when the BCA result is 1.0 or greater, i.e., providing more benefits than costs to society.

The gas BCA approach follows the accepted electric BCA approach as much as possible. The Company used the Gas BCA framework to evaluate the Gas DR Pilot, and also plans to utilize the Gas BCA Framework to evaluate other gas programs including the Non-Pipeline Solutions RFP. Some modifications were necessary to focus on key analytical drivers including: recognizing the costs and benefits of heating electrification, better capturing the benefits of heating measures, and providing a methodology for evaluating local supply options. It recognizes the benefits and costs of heating electrification by including summer and winter electric system costs and benefits, evaluating projects based on incremental project costs, and using a comparable CO_2 cost for electricity and gas. It better captures the benefits of peak day and winter season gas load reductions by including the avoided cost of

new pipeline capacity and other upstream capacity costs as a potential benefit, using seasonal commodity prices and recognizing higher peak day prices, and recognizing the potential avoided cost of on-system upgrades as a capacity metric.

The Societal Cost Test (SCT) is the primary metric used for the BCA. It includes incremental benefits to society as a whole, including CO_2 impacts, compared to the baseline alternative. It includes the incremental project cost, including any of those costs borne by the customer. Major benefit streams included in the SCT are: avoided upstream pipeline capacity and delivered services costs, on-system capital costs, gas commodity costs, CO_2 emissions, electric commodity costs, electric capacity costs, and electric transmission and distribution costs.

Con Edison has calculated the cost-effectiveness for the Performance-Based Gas DR Pilot using the Gas BCA Framework, and under the participation assumed in this Implementation Plan, the Societal Cost Test value exceeds 1.0.

Con Edison evaluated two primary scenarios for the BCA:

1. Benefit stream includes avoiding pipeline capacity costs as well as delivered services costs (BCA = 1.43).
2. Benefit stream includes only avoiding delivered services (BCA = 1.09).

Both primary scenarios assume that the program has reached a steady state (i.e., the 10-year time period considered starts in 2021 after the pilot is over), which means that the higher administrative costs associated with the pilot phase have been lowered and the costs associated with non-AMI meters have been eliminated. The blended zone A and zone B values are based on the current CSRP enrollments.

Con Edison also performed a sensitivity analysis on some of the parameters used in the BCA, including the fraction of participating customers in Zone B, and looking at the BCA over the time period that includes the pilot starting in 2018. The BCA exceeds 1.0 for all sensitivity runs when the avoided pipeline capacity costs were included. In the scenario where the benefit stream only includes avoiding delivered services, and not the avoided pipeline capacity, sensitivity runs with a higher proportion of participating customers in Zone B show a BCA higher than 1.0, however those runs with lower proportion of participating customers in Zone B have a BCA lower than 1.0. This is because the Zone B customers have lower incentive rates. The BCA will be re-evaluated throughout and at the end of the pilot period.

Table 5: Results of primary BCA scenarios as well as sensitivity analyses. All values are for the SCT.

Program	Base Case: Avoid Pipeline Costs (Zone A)	Low Benefits Case: Delivered Services Only*
10 Yr Program (2021 – 2030) • 76% Zone B enrollment	1.43	1.09
10 Yr Program (2021 – 2030) • 50% Zone B enrollment	1.61	0.97
10 Yr Program (2021 – 2030) • 100% Zone B	1.22	1.22
10 Yr Program (2018 – 2027) • Includes pilot phase • Reduces admin costs starting in 2021 • 50% Zone B enrollment	1.14	0.79

Primary BCA Scenario evaluated

* Delivered Services modeled at current prices

Appendix A. Gas DR Pilot Value Zones

Table 5 presents the zip codes by zone for determining customer incentives and eligibility for the Gas DR Pilot, as discussed in Section 4.1.

Table 5. Gas DR Pilot Value Zones for Customer Incentives and Eligibility

Gas Reduction Value	ZIP	Location
Zone A. Higher	10528	Westchester County
	10538	Westchester County
	10543	Westchester County
	10573	Westchester County
	10577	Westchester County
	10580	Westchester County
	10601	Westchester County
	10604	Westchester County
	10605	Westchester County
	10606	Westchester County
	10801	Westchester County
	10803	Westchester County
	10804	Westchester County
	10805	Westchester County
	10033	Manhattan
	10034	Manhattan
	10040	Manhattan
	10451	Bronx
	10452	Bronx
	10453	Bronx
	10454	Bronx
	10455	Bronx
	10456	Bronx
	10457	Bronx
	10458	Bronx
	10459	Bronx
	10460	Bronx
	10461	Bronx
	10462	Bronx
	10463	Bronx
	10464	Bronx
	10465	Bronx
	10466	Bronx
	10467	Bronx
	10468	Bronx
	10469	Bronx
	10470	Bronx
	10471	Bronx
	10472	Bronx
	10473	Bronx
	10474	Bronx
	10475	Bronx

Gas Reduction Value	ZIP	Location
	10502	Westchester County
	10503	Westchester County
	10504	Westchester County
	10506	Westchester County
	10507	Westchester County
	10510	Westchester County
	10514	Westchester County
	10522	Westchester County
	10523	Westchester County
	10530	Westchester County
	10532	Westchester County
	10533	Westchester County
	10549	Westchester County
	10550	Westchester County
	10552	Westchester County
	10553	Westchester County
	10562	Westchester County
	10570	Westchester County
	10583	Westchester County
	10591	Westchester County
	10594	Westchester County
	10595	Westchester County
	10603	Westchester County
	10607	Westchester County
	10701	Westchester County
	10703	Westchester County
	10704	Westchester County
	10705	Westchester County
	10706	Westchester County
	10707	Westchester County
	10708	Westchester County
	10709	Westchester County
	10710	Westchester County
Zone B. Lower	10001	Manhattan
	10002	Manhattan
	10003	Manhattan
	10004	Manhattan
	10005	Manhattan
	10006	Manhattan
	10007	Manhattan
	10009	Manhattan
	10010	Manhattan
	10011	Manhattan
	10012	Manhattan
	10013	Manhattan
	10014	Manhattan
	10016	Manhattan
	10017	Manhattan
	10018	Manhattan

Gas Reduction Value	ZIP	Location
	10019	Manhattan
	10020	Manhattan
	10021	Manhattan
	10022	Manhattan
	10023	Manhattan
	10024	Manhattan
	10025	Manhattan
	10026	Manhattan
	10027	Manhattan
	10028	Manhattan
	10029	Manhattan
	10030	Manhattan
	10031	Manhattan
	10032	Manhattan
	10035	Manhattan
	10036	Manhattan
	10037	Manhattan
	10038	Manhattan
	10039	Manhattan
	10041	Manhattan
	10044	Manhattan
	10045	Manhattan
	10065	Manhattan
	10069	Manhattan
	10075	Manhattan
	10080	Manhattan
	10103	Manhattan
	10104	Manhattan
	10105	Manhattan
	10106	Manhattan
	10110	Manhattan
	10111	Manhattan
	10112	Manhattan
	10115	Manhattan
	10118	Manhattan
	10119	Manhattan
	10121	Manhattan
	10122	Manhattan
	10123	Manhattan
	10128	Manhattan
	10152	Manhattan
	10154	Manhattan
	10162	Manhattan
	10165	Manhattan
	10166	Manhattan
	10167	Manhattan
	10169	Manhattan
	10170	Manhattan
	10172	Manhattan

Gas Reduction Value	ZIP	Location
	10173	Manhattan
	10174	Manhattan
	10175	Manhattan
	10176	Manhattan
	10178	Manhattan
	10271	Manhattan
	10278	Manhattan
	10279	Manhattan
	10280	Manhattan
	10281	Manhattan
	10282	Manhattan
	10285	Manhattan
	11004	Queens
	11101	Queens
	11102	Queens
	11103	Queens
	11104	Queens
	11105	Queens
	11106	Queens
	11354	Queens
	11355	Queens
	11356	Queens
	11357	Queens
	11358	Queens
	11360	Queens
	11361	Queens
	11362	Queens
	11363	Queens
	11364	Queens
	11365	Queens
	11366	Queens
	11367	Queens
	11370	Queens
	11426	Queens
	11427	Queens
	11428	Queens
	11432	Queens
	11435	Queens
	11439	Queens
Ineligible to participate[9]	10501	Westchester County
	10505	Westchester County
	10511	Westchester County
	10517	Westchester County
	10520	Westchester County
	10526	Westchester County
	10527	Westchester County

[9] In the 4/26/18 Implementation Plan filing, zip codes 10505, 10511, 10520, 10535, 10536, 10547, 10548, 10566, 10567, 10588, 10589, and 10598 were inadvertently included in both Zone B and Ineligible to Participate. These zip codes are not eligible to participate. This filing updates the zone assignment for these 12 zip codes.

Gas Reduction Value	ZIP	Location
	10535	Westchester County
	10536	Westchester County
	10540	Westchester County
	10547	Westchester County
	10548	Westchester County
	10566	Westchester County
	10567	Westchester County
	10588	Westchester County
	10589	Westchester County
	10596	Westchester County
	10598	Westchester County