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| Program ReportNew Jersey Natural Gas Energy Management Program Evaluation – Program Year 1**Date:** January 26, 2023 |
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Abstract

DNV conducted a process evaluation and an evaluability assessment for the Energy Management program of the Energy Solutions of Business program.

Findings

The Energy Management subprogram is a new offering and did not have any completed projects or claimed savings in PY1. Therefore, there are **no impact-related findings**.

The **process evaluation found** that NJNG’s focus in the first program year was to successfully transition from NJCEP’s C&I Existing Building Programs. NJNG had extensive work to complete, including coordination with the other NJ utilities, setting up internal systems, data management, and hiring implementation and evaluation contractors. The focus on existing programs was done to minimize the disruption to customers. The Energy Management program launched in the Spring of 2022. This later launch timeline resulted in no claimed savings for the first program year.

The **evaluability assessment** analyzed which data points should be collected at the time of implementation to allow for an effective evaluation of three categories and the algorithms that will be used to estimate savings. The algorithms are listed here:

**Standalone storage water heaters:** Fuel Savings (MMBtu/yr) = ((1 – (EFFb / EFFq) + SLF49) \* Energy Use Density \* Area / 1000 kBtu/MMBtu

**Instantaneous gas water heaters:** Fuel Savings (MMBtu/yr) = ((1 – (EFFb / EFFq) + SLF50) \* Energy Use Density \* Area

**Gas chillers:**

* Winter Gas Savings (MMBtu/yr) = (VBEq – BEb)/VBEq \* IR \* EFLHc
* Energy Savings (kWh/yr) = Tons \* (kW/Tonb – kW/Tongc) \* EFLHc
* Summer Gas Usage (MMBtu/yr) = MMBtu Output Capacity / COP \* EFLHc
* Net Energy Savings (kWh/yr) = Energy Savings + Winter Gas Savings – Summer Gas Usage
* Peak Demand Savings (kW) = Tons \* (kW/Tonb – kW/Tongc) \* CF

Recommendations

**Process Evaluation:** Continue to identify and recruit eligible customers to the Energy Management program.

**Impact Evaluation:** As program participation in PY2 increases and measures are selected for customers, consider discussing proposed engineering approaches projects with the evaluation team, particularly for more complex custom measures.

**Evaluability Assessment:** The required standard program data that will be needed to evaluate the Energy Management program are: Participant, Program Dates, Baseline Equipment, Partner Utility Data, Subcontractor Data, Recommended Measures, Installed/Not Installed Measures, Installed Measure Characteristics, Job Cost, and Energy Savings. The Energy Management program is a comprehensive program tailored to a customer’s specific needs. As such, measures and associated tracking metrics may not fit in a traditional format. DNV will work with NJNG engineers and contractors during the planning (or ex-ante) phase of a project to ensure the appropriate metrics are being collected to support evaluation efforts. Below, we summarize the processes for assuring the extra data needed for each project’s impact evaluation.

Executive summary

This report provides the results of the process evaluation of New Jersey Natural Gas’s (NJNG) Energy Solutions for Business – Energy Management subprogram for the Program Year (PY) period beginning July 1, 2021, and ending on June 30, 2022 (PY1). The Energy Management subprogram is further categorized into Building Operations, Retro-Commissioning, and Strategic Energy Management (SEM) pathways.

It is important to note that during PY1, NJNG maintained an initial focus on a successful transition of programs that had previously been run by New Jersey’s Clean Energy Program (NJCEP) to try to avoid any disruption to the marketplace. Accordingly, NJNG did not launch newer subprograms like Energy Management until much later in the Program Year.

Summary of methods

**Process evaluation:** DNV conducted in-depth interviews with program staff to learn more about the history and context of its programs, program design and processes, and challenges and opportunities. As part of our C&I interviews, we spoke with the Director of SAVEGREEN at NJNG about the Energy Solutions for Business program, the Commercial Supervisor and the Senior Evaluation Measurement & Verification Specialist.

**Impact evaluation:** Due to no claimed savings in Year 1, no impact evaluation activities were conducted for the Energy Management program.

**Evaluability assessment:** DNV conducted an evaluability assessment for the program in PY1 evaluation. This assessment included reviewing the anticipated common measure types within the program and providing recommended best practices for information and data points that should be collected at the time of implementation to allow for an effective evaluation. This assessment will ensure all critical tracking data inputs are being collected.

Findings and recommendations

**Process evaluation:**

* NJNG’s focus in the first program year was to successfully transition existing programs from NJCEP. NJNG had extensive work to complete, including coordination with the other NJ utilities, setting up internal systems, data management, and hiring implementation and evaluation contractors. The focus on existing programs was done to minimize the disruption to customers.  The Energy Management program launched in the Spring of 2022. This later launch timeline resulted in no closed projects and claimed savings for the first program year.

**Impact evaluation:**

* As there were no claimed savings, no impact findings will be discussed
* As program participation in PY2 increases and measures are selected for customers, consider discussing proposed engineering approaches projects with the evaluation team, particularly for more complex custom measures.

**Evaluability assessment:**

As noted above, the Energy Management program is a comprehensive program tailored to a customer’s specific needs. As such, measures and associated tracking metrics may not fit in a traditional format. DNV will work with NJNG engineers and contractors during the planning (or ex-ante) phase of a project to ensure the appropriate metrics are being collected to support evaluation efforts. Below, we summarize the processes for assuring the extra data needed for each project’s impact evaluation. The required standard program data that will be needed to evaluate the Energy Management program are summarized in the following table:

ES-1. Program data needed to evaluate Energy Management program

|  |  |  |
| --- | --- | --- |
| Type | Variables | Use |
| Participant | Name, address, phone number, email address, account number, business type | Participant surveys |
| Program Dates | Audit date, job approval date, installation date, work submit date, inspection date, payment date | Process AnalysisImpact Analysis |
| Baseline Equipment | Baseline efficiency levels, fuel type, system type, system size | TRM Update |
| Partner Utility Data | Utility name, customer account number | Match to the electric usage data for the billing analysis. |
| Subcontractor Data  | Company name, contact name, phone number, email  | Contractor interviews |
| Recommended Measures | All recommended measures, gas savings, electric savings, demand savings | Missed Opportunities |
| Installed Measures | Installed measures, gas savings, electric savings, demand savings | Impact analysis |
| Installed Measure Characteristics | Installed efficiency levels, fuel type, system type, system size | TRM Update |
| Job Cost | Cost for audit and installed measures | Cost-effectiveness |
| Energy Savings | Annual and lifetime gas savings, annual and lifetime electric savings, demand savings[[1]](#footnote-2), gas MMBtu savings, electric MMBtu savings, Total Energy Savings | Realization RateTRM Updates |

# Introduction

This report provides the results of the process evaluation of New Jersey Natural Gas’s (NJNG) Energy Solutions for Business – Energy Management (hereafter referred to as "Energy Management") subprogram for the Program Year (PY) period beginning July 1, 2021, and ending on June 30, 2022 (PY1). As shown in Figure 1‑1, this program is under the umbrella of NJNG Business Program’s Energy Solutions for the Business program.

Energy Solutions for Business is divided into three subprograms, Prescriptive and Custom Measures, Energy Management, and Engineered Solutions (see Figure 1‑1). Energy Management is further categorized into Building Operations, Retro-Commissioning, and Strategic Energy Management (SEM) pathways. The Building Operations pathway targets existing medium commercial building types and uses traditional building systems and controls, Retro-Commissioningtargets both medium and large building types that use energy management systems (EMS), and SEM targets large and very large building customers with significant energy use and commit to on-going participation and engagement across the organization including various levels of management and decision making.

It is important to note that during PY1, NJNG maintained an initial focus on a successful transition of programs that had previously been run by New Jersey’s Clean Energy Program to try to avoid any disruption to the marketplace. Accordingly, NJNG did not launch newer subprograms like Energy Management until the spring of 2022.

Figure 1‑1. Diagram of Energy Management subprogram



## Program design and implementation

The Energy Management Program was designed to complement the C&I Prescriptive/Custom and Engineered Solutions subprograms. While those subprograms focus on facility equipment upgrades or process improvements, Energy Management aims to help NJNG’s commercial and industrial customers achieve energy savings through three tracks that can be completed individually or in combination (see Figure 1‑1). On receipt of the program application, NJNG program staff analyze the application, gather all necessary customer information to support the application, and consult with the customer to recommend the most suitable program track:

1. **Building Operations**
* HVAC tune-up: provides tune-ups for central HVAC systems, mini-splits, and packaged terminal units. Potential measures include refrigeration charge correction, cleaning of evaporator and condenser coils, filter changes, fan and motor adjustments, and other repairs. Measures may include:
* Combustion analysis.
* Refrigeration charge correction (if needed).
* Cleaning evaporator and condenser coils.
* Filter changes.
* Verification of proper operation of fans and motors.
* Other minor repairs to refrigerant lines and coils.
* Building tune-up: provides a pathway for adjusting and calibrating building systems and controls. Measures could include calibration of lighting and HVAC systems, diagnostic testing, HVAC controls, lighting controls, chiller controls, and Building Operations Training for personnel. Measures may include:
* Calibration of building systems and controls, including energy management systems, lighting and HVAC.
* Diagnostic and function tests of applicable major systems and equipment.
* HVAC controls to optimize rooftop units (RTU)/air handling units (AHU).
* Boiler systems and controls.
1. **Retro-Commissioning**
* Provides a comprehensive assessment of a customer’s commercial or industrial site. This pathway includes a building audit, the creation of an action plan for retro-commissioning activities, and an M&V plan to ensure building performance.
* Typical Retro-Commissioning measures may include:
* Optimizing chiller and boiler operations to better match building load conditions.
* Reducing ventilation in over-ventilated areas.
* Fixing ventilation dampers that are open when they should be closed or vice versa.
* Decreasing supply air pressure setpoint and system rebalancing.
* Aligning zone temperature setpoints to match the building’s actual operating schedule.
* Virtual Commissioning (“VCx”).
1. **Strategic Energy Management (SEM)**
* Designed to optimize energy consumption for larger C&I customers through a long-term holistic approach, including managing systems, processes, behavior, and tracking/benchmarking performance. SEM plans could include improvements to Building Automation Systems, a maintenance plan for existing building equipment, engagement with building users and facility personnel to track long-term performance, and utilization of other subprograms. SEM projects have a long timeline, typically focused on developing and executing an energy management strategy. This strategy is formulated through a multiple site and/or remote visits and interviews with building owners and staff to specifically develop a Strategic Energy Management Plan (“SEMP”) for the customer’s facility. The SEMP will be reviewed with the customer by the utility and/or its third-party implementation contractor on a scheduled basis. This plan may include:
* Revisions or improvements to an existing Building Automation System or the addition and initiation of the use of a Building Automation System to monitor and control the buildings components and systems. The implementation or improvements to a system or the review of an existing system can include the proper training for building operators to achieve maximum efficiency.
* Development of a maintenance plan for existing building components and or systems to identify best practices in building performance and an interactive monitoring of system components by both staff and sponsoring utilities.
* Ongoing engagement to track energy usage and performance, assist with planning energy efficiency projects, and interact with facility personnel to adopt energy efficiency strategies and behaviors.
* Utilizing other subprogram offerings, including: Prescriptive/Custom measures, Building Tune-Up, RCx, and VCx.

NJNG administers and promotes this program and selects third-party implementation contractors to manage the delivery of this subprogram. Table 1‑1 shows the targeted participation and savings goals for the first triennium. Per the Annual Progress Report filing[[2]](#footnote-3), there were no claimed savings in PY1. More details on the program's performance are provided in the Process Evaluation section of this report.

Table 1‑1. C&I Energy Management subprogram estimated participation and savings[[3]](#footnote-4)

|  |  |  |  |
| --- | --- | --- | --- |
| Metric | PY1 | PY2 | PY3 |
| Estimated Participants[[4]](#footnote-5)  | 10 | 12 | 13 |
| Projected Net Annual Natural Gas Savings (Therms) | 24,078 | 27,690 | 31,843 |

# Process evaluation

## Program goals

Per the NJNG Annual Progress report, this subprogram forecasted 10 participants in PY1 with an estimated gas savings of 24,080 therms (Table 1‑1). The program did not have any completions in PY1. The lack of participation in the program was attributed to delayed launch of the program and long lead times for project development.

## Program staff interviews

DNV conducted in-depth interviews with two NJNG energy efficiency program implementation staff members in June 2022. We used these interviews to both learn about and document staff perceptions of the following:

* Roles and responsibilities with the programs
* Program design and processes, including marketing and outreach
* Program metrics and performance against goals
* Challenges and opportunities

As part of our C&I interviews, we spoke with the Director of SAVEGREEN (“Director”) about the Energy Solutions for Business program. His role with SAVEGREEN extends back to 2009, when he first began working on NJNG’s SaveGreen programs. With 13 years of experience, he expressed a deep understanding of the programs, including the software systems used, and is, therefore, able to provide technical support to other staff on both residential and commercial programs. At a high level, he described his role as being responsible for program development and new technologies. He is responsible for the management of the commercial and industrial teams. The evaluation team also interviewed the Commercial Supervisor and the Senior Evaluation Measurement & Verification Specialist as part of this study.

### Program delivery

Prior to June 30, 2021, many energy efficiency programs were administered through the Board of Public Utilities (BPU), which contracted with a third-party implementer. Due to legislation passed in 2018 that called for utilities to hit annual energy savings targets, the BPU conducted a proceeding regarding the implementation of that law. They ultimately decided to transfer the administration of the programs[[5]](#footnote-6) of most retrofit programs to the utilities, who are charged with achieving energy savings in their respective service territories. Utilities were also allowed to propose additional programs in the September 2021 filing. Program staff noted that they implement the bulk of the program themselves, using internal NJNG staff and only a few external implementers. The SAVEGREEN Director preferred this internal delivery approach, stating that it fosters an ability to cultivate closer customer relationships and provide information and address any complaints directly with the customer. Installation of projects is conducted by engineering firms and or contractors.

### Program design and processes

Energy Management subprogram targets energy savings for existing commercial and industrial facilities by providing a holistic approach to improving building energy performance through maintenance, tune-up and retro-commissioning services for existing buildings and through the implementation of energy savings strategies that improve the overall operation and energy performance of buildings and building systems. The program intends to compliment (see Figure 1‑1) the Prescriptive/Custom and Engineered Solutions subprograms which focuses on capital equipment replacement or process improvement investments by improving the energy performance of a building by maintaining, adjusting and optimizing the systems within the building and the implementation of complimentary energy savings measures. The program also provides paths to track the ongoing building energy performance by using retro-commissioning and strategic energy management strategies, which ensures continued energy performance. By implementing these measures, customers also receive ancillary benefits including improved occupant comfort, lower maintenance costs, and extended equipment life.

NJNG actively markets its C&I programs. Both the Director and the marketing manager for The SAVEGREEN Project® described a wide variety of marketing and outreach channels for the commercial markets in general but the primary focus for this program would be direct customer outreach.

### Tracking metrics

The Director explained that NJNG is bound by a June 10, 2020, BPU order to report program metrics within 75 days of the close of the program year[[6]](#footnote-7). Program years run from July 1 through June 30. This program reporting includes metrics related to energy savings, customer participation, dollars invested, administrative costs, and other defined quantitative performance indicators. The program tracks must also capture multiple technical data points like EFLHh (effective full-load heating hours), efficiencies for Boiler Reset Controls, Boilers, and Furnace measures to ensure the energy savings are properly recorded in accordance with approved Technical Resource Manual calculations (previously referred to as the NJCEP protocols).

### Challenges and opportunities

The Director described all the C&I programs as getting off to a slow start after the transition from the BPU. He cited a couple of reasons, including modified incentive structures, COVID-19, and related supply chain issues. Primarily, though, NJNG’s focus in the first program year was to successfully transition existing programs from NJCEP. NJNG had extensive work to complete, including coordination with the other NJ utilities, setting up internal systems, data management, and hiring implementation and evaluation contractors. The focus on existing programs was done to minimize the disruption to customers. The Energy Management program launched in the spring of 2022. This later launch timeline resulted in no completed projects and claimed savings for the first program year.

# Impact evaluation

Due to no claimed savings, an impact evaluation was not conducted for the Energy Management program in PY1. Therefore, there are no impact evaluation findings and recommendations.

# Evaluability assessment

DNV conducted an evaluability assessment for Energy Management subprogram in PY1. This assessment included reviewing the anticipated common measure types within the program and providing recommended best practices for information and data points that should be collected at the time of implementation to allow for an effective evaluation.

Similar to the Engineered Solutions program, the measures in the Energy Management subprogram include HVAC, building envelope, motors, lighting, controls, and other building systems, energy efficiency, and energy-consuming equipment. Although no projects were completed in PY1 and PY2 projects are currently in the audit phase of the program, the evaluation team has summarized the required engineering inputs for commonly replaced measures for similar programs.

The Energy Management program is a comprehensive program tailored to a customer’s specific needs. As such, measures and associated tracking metrics may not fit in a traditional format. DNV will work with NJNG engineers during the planning (or ex-ante) phase of a project to ensure the appropriate metrics are being collected to support evaluation efforts.

## Standalone storage water heaters

This measure is intended for standalone storage water heaters installed in commercial facilities. The following data points would need to be collected and provided in the program tracking data for standalone storage water heaters:

* EFFq = Efficiency of the qualifying water heater
* EFFb = Efficiency of the baseline water heater, commercial grade
* EFb = Energy Factor of the baseline water heater, commercial grade
* Energy Use Density = Annual baseline water heater energy use per square foot of commercial space served (MMBtu/sq.ft./yr)
* Area = Square feet of building area served by the water heater
* SLF = Standby loss factor for savings of qualifying water heater over baseline
* SLb or q = Standby losses in kBtu/hr of the baseline and qualifying storage water heater, respectively. The baseline standby losses are calculated assuming the baseline water heater has the same input capacity rating as the qualifying unit’s input capacity using ASHRAE equipment performance standards. The qualifying unit’s standby losses are available on the AHRI certificate provided with the application.
* Capq = Rated input capacity of the qualifying water heater
* Facility Type (FACILITY TYPE )
* Equipment Size (kBtu/hr)

Where,

* SLF = (SLb – SLq) / Capq

Savings will be estimated using the following algorithm:

* Fuel Savings (MMBtu/yr) = ((1 – (EFFb / EFFq) + SLF49) \* Energy Use Density \* Area / 1000 kBtu/MMBtu

## Instantaneous gas water heaters

This measure is intended for instantaneous water heaters installed in commercial facilities. This measure assumes that the baseline water heater is either a code standalone storage water heater or an instantaneous water heater. The following data points would need to be collected and provided in the program tracking data for instantaneous gas water heaters:

* EFFq = Efficiency of the qualifying instantaneous water heater.
* EFFb = Efficiency of the baseline water heater, commercial grade.
* EFb = Efficiency of the baseline water heater, commercial grade.
* SLF = Standby loss factor of the baseline water heater fuel usage. This was calculated from standby loss and input capacity data for commercial water heaters exported from the AHRI database.
* Facility Type (FACILITY TYPE )
* Equipment Type (Gas Storage Water Heater, Gas Instantaneous Water Heater)
* Equipment Size (kBtu/hr)
* Where,
* SLF = 0.775 × Capq -0.778
* Area = Square feet of building area served by the water heater
* Capq = Rated input capacity of the qualifying water heater

Savings will be estimated using the following algorithm:

* Fuel Savings (MMBtu/yr) = ((1 – (EFFb / EFFq) + SLF50) \* Energy Use Density \* Area

## Gas chillers

The energy savings measurement for C&I gas-fired chillers is based on algorithms with inputs collected on the application form or from the manufacturer’s data sheets and utility studies. The following data points would need to be collected and provided in the program tracking data for gas chillers:

* VBEq = Vacuum Boiler Efficiency
* BEb = Efficiency of the baseline gas boiler
* IR = Input Rating = MMBtu/hour
* Tons = The rated capacity of the chiller (in tons) at site design conditions accepted by the program
* kW/Tonb = The baseline efficiency for electric chillers, as shown in the Gas Chiller Verification Summary table below
* kW/Tongc = Parasitic electrical requirement for gas chiller
* COP = Efficiency of the gas chiller
* MMBtu Output Capacity = Cooling Capacity of gas chiller in MMBtu
* CF = Coincidence Factor. This value represents the percentage of the total load that is on during the electric system peak.
* EFLHc = Equivalent Full Load Hours. This represents a measure of chiller use during the cooling season.
* Facility Type (FACILITY TYPE )

Savings will be estimated using the following algorithms:

* Winter Gas Savings (MMBtu/yr) = (VBEq – BEb)/VBEq \* IR \* EFLHc
* Energy Savings (kWh/yr) = Tons \* (kW/Tonb – kW/Tongc) \* EFLHc
* Summer Gas Usage (MMBtu/yr) = MMBtu Output Capacity / COP \* EFLHc
* Net Energy Savings (kWh/yr) = Energy Savings + Winter Gas Savings – Summer Gas Usage
* Peak Demand Savings (kW) = Tons \* (kW/Tonb – kW/Tongc) \* CF

## Whole Building / Custom Approach[[7]](#footnote-8)

The Energy Management subprogram targets energy savings for existing commercial and industrial facilities by providing a holistic approach to improving building energy performance through maintenance, tune-up and retro-commissioning services for existing buildings and through the implementation of energy savings strategies that improve the overall operation and energy performance of buildings and building systems. As such, a defined approach as outlined below may not be applicable in many project scenarios. The evaluator has also provided guidance on evaluating whole building scenarios, which may be more applicable to the Energy Management subprogram.

The following approach is intended to evaluate projects that take a more holistic approach to energy savings and outline typical requirements for evaluating such savings. It should be noted that “custom” projects vary widely, and as such, so do evaluation methods.

### Software requirements

Whole-building energy simulations are used to demonstrate energy savings from energy efficiency measures. Simulation software must be compliant with ASHRAE 90.1 Section 11 or Appendix G. Examples of allowed tools include eQUEST, HAP, EnergyPlus, Trane Trace, DOE 2.1. Approval for use in LEED and Federal Tax Deductions for Commercial Buildings program may serve as the proxy to demonstrate compliance with the requirement.

### Baseline conditions:

**Existing Buildings:** Baseline from which energy savings are measured will be based off the most recent 12 months of energy use from all sources. Site energy use is converted to source energy use following EPA’s site-to-source conversion factors.

### Measure savings:

Measures must be modeled to demonstrate proposed energy/energy cost savings, including meeting or exceeding Minimum Performance Standards, or current state or local energy code, whichever is more stringent. Minimum Performance Standards generally align with C&I equipment requirements.

Existing Buildings measures must be modeled within the approved simulation software and modeled incrementally to ensure interactive savings are taken into account.

If a software tool cannot adequately model a particular measure or component, or in cases where savings calculations outside of the model are permitted, projects are required to use stipulated savings calculations. If stipulated savings do not exist, the NJNG will work with the applicant to establish acceptable industry calculations.

## Program data assessment

DNV will work with NJNG engineers during the planning (or ex-ante) phase of a project to ensure the appropriate metrics are being collected to support evaluation efforts. Additionally, DNV has summarized the required standard program data that will be needed to evaluate the Energy Management program, summarized in Table 4‑1.

Table 4‑1. Energy Management program data assessment

|  |  |  |
| --- | --- | --- |
| Type | Variables | Use |
| Participant | Name, address, phone number, email address, account number, business type | Participant surveys |
| Program Dates | Audit date, job approval date, installation date, work submit date, inspection date, payment date | Process AnalysisImpact Analysis |
| Baseline Equipment | Baseline efficiency levels, fuel type, system type, system size | TRM Update |
| Partner Utility Data | Utility name, customer account number | Match to the electric usage data for the billing analysis. |
| Subcontractor Data  | Company name, contact name, phone number, email  | Contractor interviews |
| Recommended Measures | All recommended measures, gas savings, electric savings, demand savings | Missed Opportunities |
| Installed Measures | Installed measures, gas savings, electric savings demand savings | Impact analysis |
| Installed Measure Characteristics | Installed efficiency levels, fuel type, system type, system size | TRM Update |
| Job Cost | Cost for audit and installed measures | Cost-effectiveness |
| Energy Savings | Annual and lifetime gas savings, annual and lifetime electric savings, demand savings,[[8]](#footnote-9) gas MMBtu savings, electric MMBtu savings, Total Energy Savings | Realization RateTRM Updates |

## Program comparisons

This section provides a review of process findings of programs that have been implemented around the country and a comparison to NJNG’s Energy management program. DNV focused on Strategic Energy Management (SEM) programs, as data for those programs was available for comparison. Key findings demonstrated in Table 4‑2 include:

* Note that the Program awareness in SEM is expected to be driven by customer’s experience in other energy efficiency programs
* Free-ridership was not a noted impact for SEM programs.

Table 4‑2. Process program comparison

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Program Year | State/Region | Free Ridership | Spillover | NTG | Customers in Sector  | Participation | Participant Satisfaction | Savings Methodology | Notes |
| 2019 | Rhode Island[[9]](#footnote-10) | Zero[[10]](#footnote-11) | Because the intent of the program is continuous improvement, spillover of behavior change beyond the program, conceptually, is unlikely to be positive. | NR | Pilot Program | 7.00 | NR | Regression model of whole-facility consumption/ IPMVP C | For SEM Program only; ; Population includes a total seven non-wastewater treatment sites participating in the SEM demonstration. |
| 2020 | Illinois (Peoples Gas &North Shore Gas)[[11]](#footnote-12) | Not Applicable  | Not Applicable  | 100% | NR  | 10 | NR | (IPMVP) Option C (billing/ metered data regression) was the main approach to impact evaluation. | For SEM Program Only |
| 2015-2016 | Illinois (ComEd &Nicor Gas)[[12]](#footnote-13) | Not Applicable  | Not Applicable  | 95% (Electric) & 91% (Gas) | 100 (identified) | 10 | 8/10 | Gross savings were calculated through a combination of model reviews and participant surveys | For SEM Program Only |

# CONCLUSIONS and KEY FINDINGS

**Process evaluation:**

NJNG’s focus in the first program year was to successfully transition existing programs from NJCEP. NJNG had extensive work to complete, including coordination with the other NJ utilities, setting up internal systems, data management, and hiring implementation and evaluation contractors. The focus on existing programs was done to minimize the disruption to customers.  The Energy Management program launched in the Spring of 2022. This later launch timeline resulted in no completed projects and no claimed savings for the first program year.

**Impact evaluation:**

* As there were no claimed savings, no impact findings will be discussed.
* As program participation in PY2 increases and measures are selected for customers, the evaluator encourages NJNG to discuss proposed engineering approaches, particularly for more complex custom measures.

**Evaluability assessment:**

The required standard program data that will be needed to evaluate the Energy Management program are summarized in the following table:

Table 5‑1. Program data needed to evaluate Energy Management program

|  |  |  |
| --- | --- | --- |
| Type | Variables | Use |
| Participant | Name, address, phone number, email address, account number, business type | Participant surveys |
| Program Dates | Audit date, job approval date, installation date, work submit date, inspection date, payment date | Process AnalysisImpact Analysis |
| Baseline Equipment | Baseline efficiency levels, fuel type, system type, system size | TRM Update |
| Partner Utility Data | Utility name, customer account number | Match to the electric usage data for the billing analysis. |
| Subcontractor Data  | Company name, contact name, phone number, email  | Contractor interviews |
| Recommended Measures | All recommended measures, gas savings, electric savings, demand savings | Missed Opportunities |
| Installed Measures | Installed measures, gas savings, electric savings, demand savings | Impact analysis |
| Installed Measure Characteristics | Installed efficiency levels, fuel type, system type, system size | TRM Update |
| Job Cost | Cost for audit and installed measures | Cost-effectiveness |
| Energy Savings | Annual and lifetime gas savings, annual and lifetime electric savings, demand savings[[13]](#footnote-14), gas MMBtu savings, electric MMBtu savings, Total Energy Savings | Realization RateTRM Updates |

The evaluability assessment analyzed which data points should be collected at the time of implementation to allow for an effective evaluation of three categories: standalone storage water heaters, instantaneous gas water heaters, and gas chillers. The assessment also determined the algorithms that will be used to estimate savings:

Standalone storage water heaters: Fuel Savings (MMBtu/yr) = ((1 – (EFFb / EFFq) + SLF49) \* Energy Use Density \* Area / 1000 kBtu/MMBtu

Instantaneous gas water heaters: Fuel Savings (MMBtu/yr) = ((1 – (EFFb / EFFq) + SLF50) \* Energy Use Density \* Area

Gas chillers:

* Winter Gas Savings (MMBtu/yr) = (VBEq – BEb)/VBEq \* IR \* EFLHc
* Energy Savings (kWh/yr) = Tons \* (kW/Tonb – kW/Tongc) \* EFLHc
* Summer Gas Usage (MMBtu/yr) = MMBtu Output Capacity / COP \* EFLHc
* Net Energy Savings (kWh/yr) = Energy Savings + Winter Gas Savings – Summer Gas Usage
* Peak Demand Savings (kW) = Tons \* (kW/Tonb – kW/Tongc) \* CF

###### PROGRAM STAFF FEEDBACK

General information

1. Can you explain what your role and responsibilities are for this program and also of your company?
2. Is there anything in particular you are interested in having the evaluators study?

Communication and structure

1. [If not already mentioned] What are the goals of the program? How are they set? [PROBE: segment targets, measure targets, energy efficiency savings, geographic targets, customer satisfaction, etc.]
2. What metrics do you use to measure the success of the program?
	1. Are there any metrics you would like to see incorporated into measuring and reporting on this program?
3. How is the program currently progressing against its goals? How have they performed historically?
	1. Are you considering any revision to program goals?
4. How are program tracking metrics shared? What is the frequency and format of this reporting?
5. What data tracking systems are used for tracking program outreach? Participation? Savings? Project status? How are those integrated, if at all?
6. How, if at all, has the COVID-19 pandemic affected participation in the program? (PROBE: Effects on participation, marketing, deployment of program specifics, events/engagement)

Program process

1. [FOR REBATES] Can you describe the participation process for the program from the customer’s perspective, from first contact through rebate payment (or program completion)? At what stage of participation/customer decision making do you typically get involved?
2. Have you received any feedback on the participation process from customers?
3. How do you decide what energy savings measures are included in the program?
4. What other measures, if any, have you thought about including in the program?

Marketing and outreach

1. How is the program currently marketed? What types of outreach activities does your team do?
2. Do you conduct any community outreach or engagement? What do you do? [PROBES: how do they elicit input, WHO do they elicit it from, do they make any special efforts to engage LI or minorities (certain programs target LI customers)?]
3. How do you measure/judge the effectiveness of program marketing? What metrics does the team capture and how are they used? Do you have specific goals?
4. Is there any cross marketing between other programs?
5. What do you believe are the most persuasive marketing messages/themes for your program? How is this different for different customers and measures?
6. Is there a particular time/event that is the most effective moment to market your program? How is this different for different customers and measures?

Barriers to participation

1. What do you see as some of the main barriers to getting a customer to participate in the program?
	1. Do you have any plans on how to address these barriers?

Opportunities

1. Are there any interesting trends you’ve encountered in how the program is implemented, or what kinds of feedback customers provide about their experience?
2. Do you see other opportunities for program growth? If there was one thing you would add or change about the program, what would it be?

###### FACILITY TYPE

Table 5‑2. Facility types[[14]](#footnote-15)

|  |
| --- |
| Facility Type |
| Assembly |
| Auto Report |
| Dormitory |
| Hospital |
| Light Industrial |
| Lodging – Hotel  |
| Lodging – Motel  |
| Restaurant – Fast Food  |
| Restaurant – Full Service |
| Office – Large  |
| Office – Small |
| Other |
| Religious Worship |
| Retail – Big Box |
| Retail – Grocery |
| Retail – Small |
| Retail – Large |
| School – Community College |
| School – Postsecondary |
| School – Primary |
| School – Secondary |
| Warehouse |

###### BOILER TYPE

Table 5‑3. Boiler types

|  |
| --- |
| Boiler Type |
| Hot Water – Gas Fired |
| Hot Water – Oil Fired |
| Steam – Gas Fired |
| Steam – Gas Fired, All Except Natural Draft |
| Steam – Gas fired, Natural Draft |
| Steam – Oil Fired |

###### Energy Management Process Flow



DNV

DNV is a global quality assurance and risk management company. Driven by our purpose of safeguarding life, property and the environment, we enable our customers to advance the safety and sustainability of their business. We provide classification, technical assurance, software and independent expert advisory services to the maritime, oil & gas, power and renewables industries. We also provide certification, supply chain and data management services to customers across a wide range of industries. Operating in more than 100 countries, our experts are dedicated to helping customers make the world safer, smarter and greener.

1. Demand savings are not defined for gas (therm) projects. [↑](#footnote-ref-2)
2. https://www.njcleanenergy.com/files/file/UTILITY%20REPORTING/4Q%20FY22/NJNG%20-%20NJ%20Annual%20Report-Executive%20Summary%20-%2010\_17\_22.pdf [↑](#footnote-ref-3)
3. Per The SAVEGREEN Project Program Plan (NJNG) -12/21/2020 (approved in 3/22). [↑](#footnote-ref-4)
4. Participants = Count based on number of applications/projects completed not account number. [↑](#footnote-ref-5)
5. Administration of New Construction programs remained with the Office of Clean Energy, per New Jersey Board of Public Utilities, June 10, 2020. <https://www.nj.gov/bpu/pdf/boardorders/2020/20200610/8D--Order%20Directing%20the%20Utilities%20to%20Establish%20Energy%20Efficiency%20and%20Peak%20Demand%20Reduction%20Programs.pdf> [↑](#footnote-ref-6)
6. For PY1 filing, the utilities have been given an extension of 30 days and the annual progress report was filed on October 17, 2022. [↑](#footnote-ref-7)
7. This approach is outlined in New Jersey Board of Public Utilities New Jersey’s Clean Energy Program TM Protocols to Measure Resource Savings [↑](#footnote-ref-8)
8. Demand savings are not defined for gas (therm) projects. [↑](#footnote-ref-9)
9. Strategic Energy Management Program & Savings Review (National Grid Rhode Island) [↑](#footnote-ref-10)
10. Based on anecdotal evidence from conversations with SEM program managers, testimonials from facility managers, and evaluators [↑](#footnote-ref-11)
11. Strategic Energy Management Impact Evaluation Report (Peoples Gas and North Shore Gas) [↑](#footnote-ref-12)
12. Strategic Energy Management (SEM) Evaluation Report (ComEd and Nicor Gas) [↑](#footnote-ref-13)
13. Demand savings are not defined for gas (therm) projects. [↑](#footnote-ref-14)
14. Note that not all facility types noted are relevant to the Energy Management program. [↑](#footnote-ref-15)