NYSERDA Industrial and Process Efficiency Close-Out Impact Evaluation

Final Report

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NYSERDA Contract #151666 September 2025

Record of revision

Document Title
NYSERDA Industrial and Process Efficiency Close-Out Impact Evaluation Report September 2025

Revision Date	Description of Changes	Revision on Page(s)
September 2025	Original Issue	Original Issue

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1 Introduction

This report summarizes data collection and analysis results for the close-out impact evaluation of the Industrial and Process Efficiency (IPE) Program funded through the Clean Energy Fund. The evaluation covers projects completed between 2018 and 2024. A subset of the evaluated projects was previously comprehensively evaluated in the 2018 IPE Concurrent Evaluation.[1] This document details the data collection methods and results for the scope of work outlined in Task Work Order No. 3 to Agreement No. 151666 (TWO ID No. 223586) modified September 3, 2024, and provides an update on the data collection plan summarized in Memo No. IPE-051724-01.

1.1 Program description

The Industrial and Process Efficiency Program's goal was to help manufacturers and data centers increase product output and improve data processing as efficiently as possible. The program incentivized industrial and data center process improvements as well as snow gun efficiency projects. Facilities could receive both electric and fossil fuel incentives from the IPE Program, subject to program requirements, and incentives were calculated based on a reduction in energy usage per unit of production or workload.

1.2 Evaluation objectives and methods

Table 1-1 summarizes the objectives of the impact evaluation with associated research questions and methods used to meet those objectives. A primary goal of this evaluation was to present the verified gross savings realization rate (VGS RR) and the verified gross savings of the IPE Program. The study verified first-year energy savings resulting from Program-incentivized projects; it does not present the energy impacts of later facility changes, nor the effects of the COVID-19 pandemic. However, the study did collect information on both first-year and current operations to understand the relative difference between first-year and current energy use.

[1] ERS, "2017-2017 Industrial and Process Efficiency Program Impact Evaluation Final Report" September 2018. https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2018-IPE-ConcurrentEvaluation-2017-18.pdf

Table 1-1. Study objectives, research questions, and methods of the impact evaluation

Research questions	Indicators	Method
What is the annualized **first year** evaluated gross energy savings based on electric(kWh) and fuel savings (MMBtu) by type at customer sites?	Verified gross savings (VGS)	• Tracking data review • Engineering reviews of project documentation, including available data and reports from Program M&V and the 2018 Concurrent Evaluation of IPE. • Participant In-Depth Interviews (IDIs)
What is the ratio of the sum of the evaluated savings to the sum of the Program-reported savings? What are the factors driving the verified gross savings realization rate (VGS RR)?	Verified gross savings realization rate (VGSRR), overall and by subgroup	
How does the program impact Disadvantaged Communities (DAC) versus non-DAC? (Activity, outcomes). How does participation and the evaluation response rate vary by DAC vs non-DAC?	Participation and evaluation response rates, VGS and VGS RR for participant facilities located in DAC versus non-DAC locations	• DAC data mapping to program tracking data set • Leveraged results from VGS and VGS RR research questions

With the close of the IPE incentive program, NYSERDA is considering future offerings to benefit energy savings and decarbonization of the industrial sector. Therefore, this study conducted a survey of IPE industrial participants to investigate current opportunities for and barriers to energy projects in IPE industrial participant facilities. Table 1-2 summarizes the objectives of the industrial customer survey. These objectives are designed to provide Program Staff with an understanding of industrial process customer plans for decarbonization improvements, and opportunities for future NYSERDA interventions to assist in those improvements.

Table 1-2. Study objectives and research questions of the industrial customer survey

Research questions	Indicators
Are participating entities planning energy projects beyond energy efficiency? Are they electrification, carbon capture and storage, or renewable fuels? If yes, collect high-level project information and whether NYSERDA Program staff can follow up with them.	Number of entities planning additional energy projects, types of projects pursued, interest in NYSERDA follow-up
What is motivating participating entities toward decarbonization/ electrification?	Responses by motivation type
What barriers have they experienced or anticipate? How might future NYSERDA program offerings assist in overcoming these barriers?	Responses by barrier type and future program offering type
How do participating companies anticipate the New York Cap-and-Invest Program (NYCI) will impact them?	Identify current and anticipated barriers, plans in place to address them
How satisfied are participants with their program experience? What recommendations do they have for improvement?	Satisfaction, recommendations by category

2 Findings, results, and recommendations

This section documents the findings, results, and recommendations of the IPE Program close-out impact evaluation, including the effectiveness of data collection and results of analysis.

2.1 Results

This section summarizes data collection, impact evaluation, and industrial customer decarbonization survey results.

2.1.1 Data collection results

Data collection for the impact evaluation included a detailed review of program tracking data, project engineering file reviews, and participant in-depth interviews (IDIs). IDIs with facility staff were attempted for all projects in the sample to verify measure savings parameters and assumptions, as well as to identify any non-routine events at the project sites. Table 2-1 outlines the interview and engineering review dispositions against the target sample within the IPE program population. The evaluation completed 16 interviews, representing 44% of the sampled 36 projects, and 33 engineering file reviews, representing 92% of the sampled 36 projects. Customers representing three projects declined to participate in the evaluation. These customers required NYSERDA to sign a non-disclosure agreement (NDA) before program participation, and declined to sign a similar NDA with the evaluator to allow access to project files, resulting in a substantial reduction to the savings coverage of the large industrial projects strata.

Table 2-1. Evaluated population: Engineering file reviews and customer interview dispositions

Measure category	Project size	Population projects	Sampled projects	Declined to participate	Completed interviews	Completed engineering reviews	Percent of evaluated population savings
Data Center Processes	Large	3	3	0	2	3	6%
	Small	15	15	0	9	15	4%
	Very Small	4	0	-	-	-	-
	No M&V	36	0	-	-	-	-
Industrial Processes	Large	4	4	2	2	2	18%
	Small	14	14	1	3	13	28%
	Very Small	18	0	-	-	-	-
	No M&V	66	0	-	-	-	-
Total		160	36	3	16	33	56%

Table 2-2 details the results of the industrial customer decarbonization survey. Data collection was attempted with all 102 sites with a goal of achieving a 22% response rate. Twelve survey responses were collected, covering 15 IPE projects, representing 15% of the project population.

Table 2-2. Data collection dispositions: industrial customer decarbonization survey

Measure category	Project population (census sample)	Non-responsive	Declined	Complete
Industrial Processes	102	85	2	15
Total	102	83%	2%	15%

2.1.1.1 Data collection challenges

The data collection effort resulted in response rates below the targeted rates for both the impact evaluation and the industrial customer decarbonization survey. Several factors contributed to the lower response rates. The data collection team encountered challenges in reaching originally defined contacts and in securing non-disclosure agreements (NDAs) for companies with these requirements, extending the data collection period beyond the original schedule. Due to the six-year span between some projects' initiation and evaluation, oftentimes knowledgeable contacts were no longer available, and alternate contacts were less knowledgeable or disinclined to report on NYSERDA project activities. Some companies in the IDI sample experienced acquisitions. Alternate contacts were secured through additional project file review, NYSERDA staff engagement, and third-party business and consumer data software.

2.1.2 Impact evaluation results

Overall, the IPE Program has achieved a 94% realization rate for annual electric energy savings and a 90% realization rate for combined heating fuel (fossil fuel) energy savings. Table 2-3 summarizes the program-level realization rates for both data center and industrial projects savings weighted.

Table 2-3. Summary of IPE impact evaluation results

Measure category	Project size	Electricity savings annual MWh (VGSRR)	Fossil fuel savings annual MMBtu (VGSRR)	Electricity relative precision	Fossil fuel relative precision	Sample size	Population size
Data Center Processes	Large	85%	-	31%	-	3	3
	Small	95%	-	0%	-	15	15
	Overall	89%	-	18%	-	18	18
Industrial Processes	Large	100%	86%	0%	11%	2	4
	Small	98%	100%	1%	0%	13	14
	Overall	98%	90%	1%	9%	15	18
Overall		94%	90%	7%	9%	33	36

Overall, the evaluated savings of the IPE program is 1,658,967 MMBtu. Table 2-4 summarizes the reported savings and evaluated first-year savings for the overall program and by strata, savings weighted based on the evaluated 18 data center projects and 15 industrial projects. A summary of the site-level evaluation analysis (utilizing unique, anonymized identifiers) is included in Appendix E.

Table 2-4. Summary of reported and evaluated savings for completed desk reviews

Measure category	Project size	Reported electricity savings annual MWh	Evaluated electricity savings annual MWh	Reported fossil fuel savings annual MMBtu	Evaluated fossil fuel savings annual MMBtu
Data Center Processes	Large	33,852	28,740	-	-
	Small	28,448	27,054	-	-
	Overall	62,300	55,794	-	-
Industrial Processes	Large	12,313	12,313	905,428	774,141
	Small	81,977	80,419	378,034	378,034
	Overall	94,290	92,732	1,283,462	1,152,175
Overall		156,590	148,526	1,283,462	1,152,175

Table 2-5 outlines the savings impact by variance categories for 15 industrial project desk reviews. Discrepancies in reported savings and evaluated savings are categorized into one of the following categories: baseline adjustment, calculation methodology, facility changes, savings interactivity, and tracking calculation error. Tracking/admin variances had the largest impact on electricity savings for industrial projects, while tracking calculation errors had the largest impact on fossil fuel savings for industrial projects.

Table 2-5. Summary of savings variances for industrial projects

Variance category	Measure count	Net electricity impact MWh	Net fossil fuel impact MMBtu
Baseline Adjustment	1	-	533
Calculation Methodology	4	1	(199)
Tracking Calculation Error	2	3	(58,018)
Savings Interactivity	2	(1,607)	-
Total	9	(1,603)	(57,683)

Table 2-6 summarizes the savings impact by variance categories for 18 data center project desk reviews. Variances due to baseline adjustments had the most significant impact on savings for data center projects.

Table 2-6. Summary of savings variances for data center projects

Variance category	Measure count	Net electricity impact MWh
Baseline Adjustment	8	(687)
Calculation Methodology	5	4,840
Facility Changes	2	(5)
Savings Interactivity	2	1,030
Tracking Calculation Error	1	(428)
Total	18	(4,760)

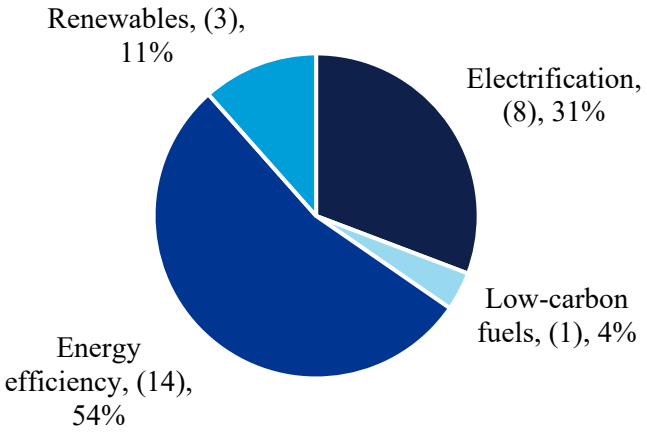
2.1.3 Industrial customer decarbonization survey results

The Industrial Customer Decarbonization Survey seeks to identify future decarbonization project plans, motivations, and barriers to execution for the industrial sector. The survey gathered information from prior program participants with industrial projects to understand their interest in future potential program support. Fifteen percent of IPE industrial process projects responded to the survey. Appendix D contains additional survey results discussed in this section.

A majority of respondent companies (9 of 12) have current interest in future decarbonization projects. Planned projects by category are shown in Figure 2-1. These include:

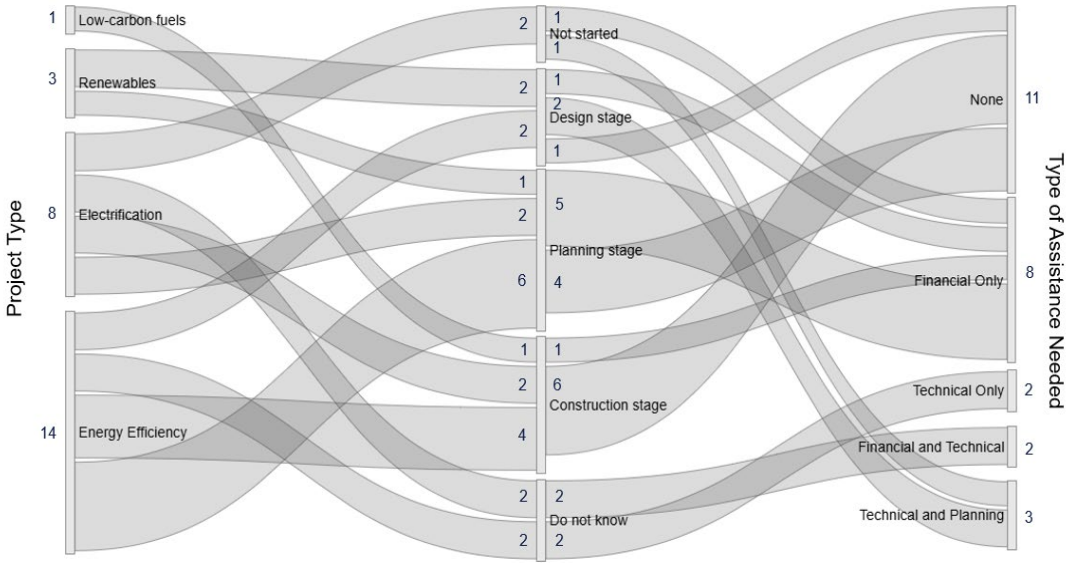
- **Electrification** of steam/natural gas heat/compressed air
- **Efficiency improvements** such as waste condensate heat recovery, compressed air optimization, steam trap replacements, and lighting conversions
- **Clean generation** through onsite solar or offsite hydro/solar PPAs.

Figure 2-1. Planned and in-progress project types



Customers reported 26 planned or in-progress projects, with energy efficiency projects making up more than half of the pipeline. Project counts decrease as the technology becomes more nascent compared to energy efficiency. Figure 2-2 illustrates the types of projects in the pipeline, their current stages, and the types of assistance reported as necessary to move them forward. The numbers displayed in Figure 2-2 indicate the project counts by project type, project stage, and type of assistance required.

Figure 2-2. Planned and in-progress project progress



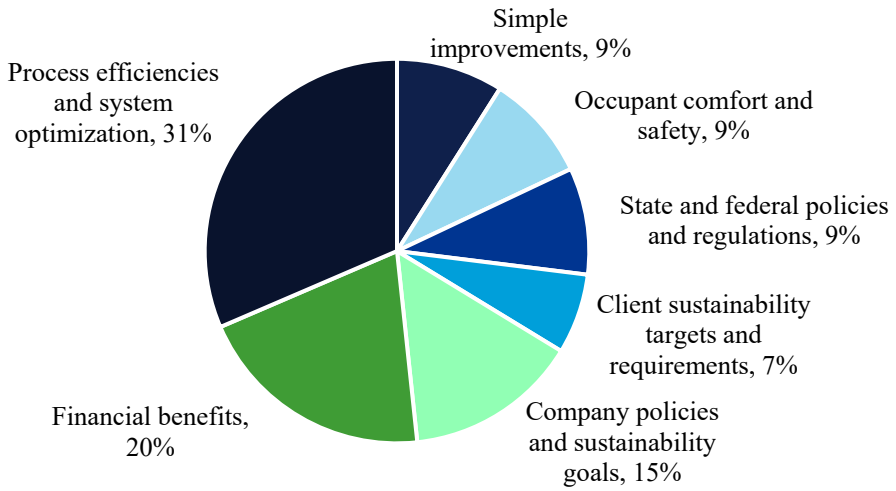
The majority of projects in the construction stage are energy efficiency projects, followed by electrification projects. Some customers are relatively new to renewables projects, and we observe that these projects are still in the early stages of the pipeline. Projects requiring planning assistance were either in the design stage or had not yet started. Those in the earlier phases of the

pipeline commonly reported needing financial support. As expected, once projects reach the construction phase, most customers indicate that no further assistance is necessary.

When asked to describe the company policy motivations for decarbonization, approximately one-third of responses cited internal, client, or state and federal policies and goals, as shown in Figure 2-3. Another one-third of motivation responses included improving process efficiency, optimizing systems, and increasing equipment life.

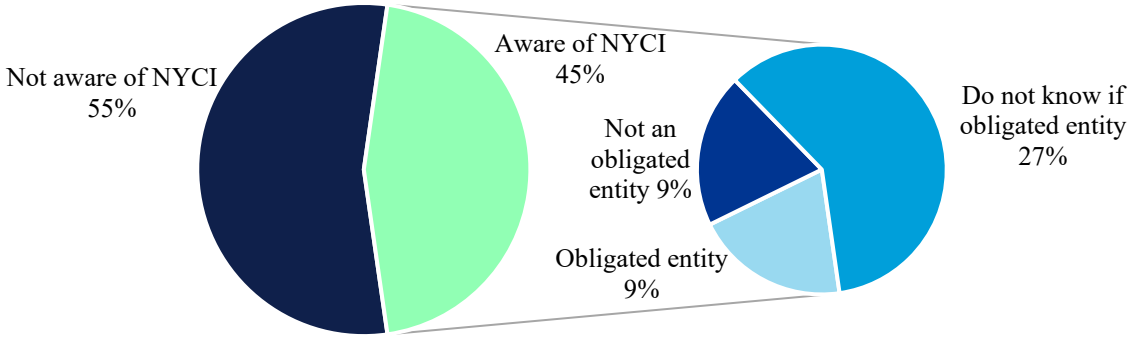
Most respondents (83%) indicated that costs still outweigh benefits and the return on investment is too high for decarbonization technologies. Fifty percent of respondents are concerned about disruptions to operations. Supply chain and availability of planned technology limit 25%, while 25% are still in the project planning stage. Suggestions for NYSERDA assistance include contractor identification or support, project management, workforce development (especially in the area of energy conservation), and grants/incentives.

Figure 2-3. Motivations to decarbonize



Respondents were surveyed on their awareness of the New York Cap-and-Invest (NYCI) Program as shown in Figure 2-4. Five of 11 respondents were familiar with NYCI, while the remaining six were unaware of it. Among the five respondents that indicated awareness of NYCI, only two respondents were aware whether their company qualified as an obligated entity. Two respondents indicated their company is actively making or has made plans to change operations in response to NYCI. One respondent noted they had a good idea how much it will affect their business, but did not have active plans to adjust for NYCI. The remaining two respondents had some knowledge of NYCI, but were unsure of its impact on their business.

Figure 2-4. Awareness of New York Cap-and Invest (NYCI) program



2.2 Findings

2.2.1 Finding 1: Program savings and realization rates

Overall, the IPE program achieved energy savings of 1,658,967 MMBtu. This verified savings result corresponds to an overall 94% realization rate for program annual electric energy savings and a 90% realization rate for combined heating fuel (fossil fuel) energy savings. The concurrent evaluation and M&V of program sites shortly after implementation largely produced accurate estimations of energy savings. However, some discrepancies such as baselines, calculation methodologies, and measure interactivity were discovered between realized project savings and savings estimated by the prior M&V as described in Recommendations 2 through 3.

Recommendation 1: N/A. Recommendations to reduce discrepancies between estimated and verified savings are provided in Recommendations 2 through 3.

2.2.2 Finding 2: Project documentation requirements

The evaluation contractor team determined the data provided was sufficient for evaluation. The program team maintained strong record keeping, including for projects that were up to six years old, and savings calculations were available for every project. Project documentation and files collected through the program typically consisted of engineering analysis (EA) review, measurement and verification (M&V) plan, project installation report (PIR), and M&V report.

In some cases, the evaluation contractor team found that the project files did not contain sufficient information regarding the baseline systems and operations to thoroughly support the reported

savings. Additionally, the project files did not contain information to confirm that the decommissioned systems were running in the baseline case before project implementation.

Recommendation 2: Ensure program submissions include guidelines and requirements for documenting the baseline case, systems, operations, and conditions.

NYSERDA Response to Recommendation: Implemented. NYSERDA is aligned with this recommendation and aims to accomplish it on all projects, leveraging the Baseline Guidance Document developed in collaboration with Michaels Energy during the 2018 Concurrent Evaluation.

2.2.3 Finding 3: Tracking of energy penalties

In some cases, electric penalties were not captured in the tracking savings data. While the installed measure resulted in increased electricity usage, the reduction in fossil fuel usage was significant enough to offer net energy savings.

Recommendation 3: Continue documenting any relevant energy penalties for implemented measures in the tracking savings data.

NYSERDA Response to Recommendation: N/A. During the IPE program, NYSERDA collected ancillary usage. This is a past practice since discontinued by NYSERDA. NYSERDA currently collects actual usage data by fuel.

3 Methods

This section details the evaluation contractor team's methods for designing the sample for the current period of this study; the process and systems used for implementing data collection activities, implementing follow-up measurements, surveys and call-backs; methods of maximizing response rates and managing low response rates, attrition and other risks; and anticipated results of data collection. Appendix A includes a detailed dataset of record and sample design.

3.1 Data collection methods

The evaluation contractor team conducted a NYSERDA project file request and engineering project file reviews for a census of sampled projects to review the quality and accuracy of savings estimates and correct for any clerical or tracking issues related to the savings claims or annualized M&V results. In-depth interviews were then attempted to collect relevant, site-specific information that may influence the evaluated savings. An additional industrial customer web survey investigated future decarbonization plans and interests for industrial sites.

This evaluation only reviewed projects that have undergone prior M&V and that are in the data center process or industrial process measure category. All other excluding the non-process (snow gun) measure category projects were excluded. Further, the evaluation sample excluded measures within the lowest 3% of cumulative savings.

The NYSERDA **project file request** was completed for a census of projects for which some prior M&V had been completed. This subset covers about 82% of population savings for the evaluation period and includes 37 projects with 43 subprojects: 19 data center process and 24 industrial processes. The evaluation team conducted desk reviews for all large projects as well as the sample of small projects that complete IDIs. No project file review or interviews were conducted for the remaining 18% of savings.

In-depth interviews (IDIs) were attempted for a census of projects for which project files were provided by NYSERDA. Recruitment for IDIs included at least six outreach attempts through email and phone calls. The NYSERDA PM delivered an advance letter notifying program participants of the web survey and IDI recruitment to verify the validity of the study, copying program staff and the evaluation recruitment contact. The evaluation contractor team solicited

Program Staff assistance with non-responsive outreach. Skilled recruitment staff scheduled interviews, and evaluation engineers completed file reviews with interview site contacts. The evaluation contractor team conducted additional outreach to alternate site contacts identified from the project files and third-party business and consumer data software.

The IDIs attempted to confirm the accuracy of savings estimate assumptions during the first year of operation. IDI instruments were designed as "virtual M&V plans" to inform the uncertain variables of each project. The evaluation team developed IDI templates per measure category, then tailored interview objectives to obtain relevant data identified from the engineer's preliminary review of project files. A typical IDI included confirmation of facility characteristics, verification of measure installation and operability, identification of non-routine events (NREs), collection of relevant equipment setpoints, and requests of any additional data needed to review the prior M&V reports.

Table 3-1. Data collection instrument modules

Module	Data points collected
Facility basics	• Facility type • Site location • Process overview • Primary fuels used • Availability of BAS capable of trending data • Information on on-site generation and/or distributed energy resources, if applicable.
Project basics	• Measure installation status • Installation date • Persistence of measure operation • Operational or maintenance issues caused by the measure

Baseline	Existing equipment (in case of equipment replacement):
	• Existing system size
	• Existing system quantity
	• Existing system efficiency
	• Other independent variables affecting existing system energy use (facility and measure dependent)
	  o Existing system throughput and production data
	  o Existing system operating hours

Baseline	Identify "typical operations" to establish normal operating conditions: • Typical occupancy • Typical or target production and throughput • Identify typical operation years, specifically applicable to pre-post-billing analysis projects
Installed measure specifics	Measure discussion: • Measure overview, what was complete, what systems were affected
Installed measure specifics	Affected systems specifics. Collect information on systems affected or newly installed equipment in case of replacement. • Affected/ New equipment size • Affected/ New equipment quantity • Affected/ New equipment efficiency

Module	Data points collected

	• Other independent variables affecting efficient system energy use (facility and measure dependent)
	  o Affected/ New equipment throughput and production data
	  o Affected/ New equipment operating hours
	  o Temperature and/or pressure set-points, load, flow rates, etc.
	• Identify typical operation years post-installation, specifically applicable to pre-post-billing analysis projects

Installed measure specifics	Trend data: • Securely collect a trend data extract of the independent variables listed above, if available
NREs	Collect information on non-routine events (NREs) that affect either the baseline or post-installation periods: • Changes in operations, production, and throughput due to COVID-19 • Changes in operations to accommodate production • Addition or removal of processes that impact overall energy use • Temporary system or equipment outages that impact overall energy use

The **industrial customer decarbonization survey** instrument was delivered via web survey (using Qualtrics) with limited phone callbacks for an attempted census of all projects in the Industrial Process measure category, regardless of prior M&V or presence in the exclusion strata. Outreach was attempted for 102 projects representing 85% of population savings. The evaluation contractor team sent an invitation to the survey via email, and sent up to four reminders to unresponsive participants. Additional outreach to alternate site contacts identified from the project files and third-party business and consumer data software was conducted. Phone call-backs included survey completion for the customers recruited for a completed IDI within the industrial process group of 36 prior M&V projects.

3.2 Analysis methods

The evaluation contractor team completed 33 engineering desk reviews of projects with previous M&V, conducting an independent review and revision (as necessary) of the analysis. The desk reviews accounted for facility conditions characterized during the IDIs whenever possible. For facilities that were not responsive to outreach efforts, the engineering desk review relied solely on the data available from the Program.

The team developed standardized, site-specific workbooks tailored for different project types and evaluation methods. The workbooks include the responses to the IDIs (where applicable), analysis of evaluated impacts, compilation of relevant supporting data, and quantification of key savings differences by category. The site-specific workbooks summarize evaluation methods and

results in a succinct report to provide evaluation results, methods, and reasons for any differences between the evaluated and estimated values.

Appendix A: Dataset of record and sampling plan

This Appendix summarizes the dataset of record and sampling plan for evaluation of the 2019-2024 Industrial Process Efficiency (IPE) Close-Out Impact Evaluation. The Dataset of Record documents the sample frame for evaluation. The sampling plan details the evaluation team's methodology for designing the sample for the current period of this study; the process and systems used for implementing data collection activities, follow-up measurements, surveys, and call-backs; methods of maximizing response rates and managing low response rates, attrition, and other risks; and anticipated results of data collection.

Dataset of record

NYSERDA provided project and measure tracking information for the population of projects to be evaluated, with completion dates between 2018 and 2024. The evaluation team compiled the tracking dataset by linking key fields from these outputs on NYSERDA contract ID to produce the dataset of record. Table A-1 and Table A-2 provide summaries of the study dataset of record, including counts of measures and projects in the evaluation dataset. The population was stratified by measure category, project size (energy savings), and whether prior M&V was completed. Table A-1 shows how the population was restricted to the sample frame for the desk review and IDI portions of this evaluation, while Table A-2 shows how the population was restricted to the sample frame for the web survey portion of the evaluation. These key fields in the tables are defined as follows:

- Measure category: Data Center Processes, Industrial Processes, and Non-Process (snow guns).
- M&V project: Indicates whether M&V was completed for a project prior to this study. Prior M&V for selected program projects was completed through the implementation of the IPE program using third-party M&V, or through a concurrent evaluation of the program. Non-process measures did not have prior M&V.
- Subproject size and category:
    - Some projects that had already completed M&V did not complete M&V for all their measures. To capture this, the evaluation team split projects into subprojects by grouping measures within each project based on whether they had received prior M&V. This increased granularity only affected the Industrial Process measure category, where the table shows 102 projects becoming 110 subprojects. Data center M&V projects were also split into M&V and No M&V subproject categories to capture two full projects listed as having completed M&V but not having an identifiable M&V savings value.

- Subproject size is based on the percentage of overall MMBtu savings within each measure category. Subprojects excluded or labeled as very small (depending on the frame) based on savings size represent the bottom 3% of overall savings within the measure category, ordered from smallest to largest. This category includes 51 subprojects accounting for 61 measures. Small subprojects represent the next 47% of savings, while large subprojects represent the top 50% of savings. On average, large subprojects have savings five times greater than small subprojects, with average savings of ~41,000 MMBtu compared to ~7,800 MMBtu.
- Some subprojects were excluded from both the desk review/IDI and web survey sample frames based on measure category and M&V status. This evaluation only reviewed subprojects that had undergone prior M&V and that were in the data center process or industrial process measure category. All other subprojects were excluded from both frames.

- Desk review/IDI or web survey: Indicates whether a particular stratum was included in the sample frame for desk reviews/IDIs or for the web survey.
- Included and excluded measures and savings: While all measures and savings were excluded if their parent subproject was excluded from the frame, some measures occurring under included subproject strata were also excluded from the desk review/IDI frame. These represent very small measures (bottom 3% of cumulative measure savings) within the non-excluded subprojects. This was done to limit the number of measures reviewed within multi-measure subprojects to those with a substantial contribution to savings. There were 44 additional measures removed in this step for the desk review/IDI frame, representing 1.5% of population savings.

Table A-1. Summary: Dataset of record to desk review/IDI sample frame

Measure category	M&V project	Number of projects in population	Desk review and IDI?	Population subproject size and category	Number of subprojects in population	Number of subprojects in desk review/IDI frame	Measures included in desk review/IDI frame	Measures excluded from desk review/IDI frame	MMBtu included in desk review/IDI frame	MMBtu excluded from desk review/IDI frame	Percent desk review/IDI frame stratum savings	Percent desk review/IDI frame overall savings	Percent of population savings	Percent of population savings in desk review/IDI frame
Data Center Processes	1. Yes	4	Yes	Large - M&V	3	3	3		115,503		49%	6%	5%	5%
	1. Yes	4	Yes	Large - No M&V	1	1	1		24,284		10%	1%	1%	1%
	1. Yes	15	Yes	Small - M&V	14	14	17	1	95,388	1,589	40%	5%	4%	4%
	1. Yes	15	Yes	Small - No M&V	1	1	1	6	1,676	4,117	1%	0%	0%	0%
	1. Yes	4	No	Very small - M&V	4	0				7,095	0%	0%	0%	0%
	2. No	6	No	Large - Exclude	6	0		10		22,657	0%	0%	1%	0%
	2. No	23	No	Small - Exclude	23	0		30		19,265	0%	0%	1%	0%
	2. No	6	No	Exclude for size	6	0		6		1,285	0%	0%	0%	0%
	Overall	**58**	**N/A**	**Overall**	**58**	**19**	**22**	**53**	**236,852**	**56,008**	**100%**	**13%**	**13%**	**11%**
Industrial Processes	1. Yes	4	Yes	Large - M&V	4	4	11	3	926,576	2,848	58%	50%	41%	41%
	1. Yes	4	Yes	Large - No M&V	2	2	1	12	20,864	8,633	1%	1%	1%	1%
	1. Yes	14	Yes	Small - M&V	13	13	21	5	571,509	3,006	36%	31%	26%	25%
	1. Yes	14	Yes	Small - No M&V	5	5	9	17	86,229	14,489	5%	5%	4%	4%
	1. Yes	18	No	Exclude for size - M&V	18	0		23		49,239	0%	0%	2%	0%
	1. Yes	18	No	Exclude for size - No M&V	2	0		3		1,298	0%	0%	0%	0%
	2. No	9	No	Large - Exclude	9	0		23		115,671	0%	0%	5%	0%
	2. No	42	No	Small - Exclude	42	0		90		105,298	0%	0%	5%	0%
	2. No	15	No	Exclude for size	15	0		23		6,656	0%	0%	0%	0%
	Overall	**102**	**N/A**	**Overall**	**110**	**24**	**42**	**199**	**1,605,178**	**307,137**	**100%**	**87%**	**85%**	**71%**
Industrial Non-Process	2. No (Excluded)	31	No	Excluded	31	0		40		41,427	100%	0%	2%	0%
	Overall	**31**	**N/A**	**Overall**	**31**	**0**	**0**	**40**		**41,427**	**100%**	**0%**	**2%**	0%
Overall		**191**	**N/A**	**Overall**	**199**	**43**	**64**	**292**	**1,842,031**	**404,573**	**N/A**	**100%**	**100%**	**82%**

Table A-2. Summary: Dataset of record to web survey frame

Measure category	M&V project	Number of projects in population	Web survey?	Population subproject size and category	Number of subprojects in population	Number of subprojects in web survey frame	Measures included in web survey frame	Measures excluded from web survey frame	MMBtu included in web survey frame	MMBtu excluded from web survey frame	Percent web survey frame stratum savings	Percent web survey frame overall savings	Percent of population savings	Percent of population savings in web survey frame
Data Center Processes	1. Yes	4	No	Large - M&V	3	0		3		115,503	49%	6%	5%	5%
			No	Large - No M&V	1	0		1		24,284	10%	1%	1%	1%
		15	No	Small - M&V	14	0		18		96,977	0%	0%	4%	0%
			No	Small - No M&V	1	0		7		5,793	0%	0%	0%	0%
		4	No	Exclude for size - M&V	4	0				7,095	0%	0%	0%	0%
	2. No (Excluded)	6	No	Large - Exclude	6	0		10		22,657	0%	0%	1%	0%
		23	No	Small - Exclude	23	0		30		19,265	0%	0%	1%	0%
		6	No	Exclude for size	6	0		6		1,285	0%	0%	0%	0%
	Overall	**58**	**N/A**	**Overall**	**58**	**0**	**0**	**75**	**0**	**292,860**	**0%**	**0%**	**13%**	**0%**
Industrial Processes	1. Yes	4	Yes	Large - M&V	4	4	14		929,424		58%	50%	41%	41%
			Yes	Large - No M&V	2	2	13		29,497		2%	2%	1%	1%
		14	Yes	Small - M&V	13	13	26		574,515		36%	31%	26%	26%
			Yes	Small - No M&V	5	5	26		100,718		6%	5%	4%	4%
		18	Yes	Very Small - M&V	18	18	23		49,239		3%	3%	2%	2%
			Yes	Very Small - No M&V	2	2	3		1,298		0%	0%	0%	0%
	2. No (Excluded)	9	Yes	Large	9	9	23		115,671		7%	6%	5%	5%
		42	Yes	Small	42	42	90		105,298		7%	6%	5%	5%
		15	Yes	Very Small	15	19	23		6,656		0%	0%	0%	0%
	Overall	**102**	**N/A**	**Overall**	**110**	**110**	**241**	**0**	**1,912,316**	**0**	**119%**	**104%**	**85%**	**85%**
Industrial Non-Process	2. No (Excluded)	31	No	Exclude	31	0		40		41,427	100%	0%	2%	0%
	Overall	**31**	**N/A**	**Overall**	**31**	**0**	**0**	**40**		**41,427**	**100%**	**0%**	**2%**	0%
Overall		**191**	**N/A**	**Overall**	**199**	**110**	**241**	**115**	**1,912,316**	**334,288**	**N/A**	104%	**100%**	**85%**
Overall		**191**	**N/A**	**Overall**	**199**	**110**	**241**	**115**	**1,912,316**	**334,288**	**N/A**	104%	**100%**	**85%**

Sampling plan

The evaluation team conducted engineering project file reviews and interviews with facility contacts to verify project energy savings. A web survey investigated future decarbonization plans and interests for industrial sites.

The sampling plan defined the following data collection activities:

1. A NYSERDA **project file request** for a census of projects for which some prior M&V was completed, excluding the non-process (snow gun) measure category, omitting projects and measures appearing in the exclusion strata defined above. This subset covers about 82% of population savings for the evaluation period and includes 37 projects with 43 subprojects: 19 data center process and 24 industrial process. The sample design planned to conduct desk reviews for all large projects as well as the sample of small projects that complete IDIs. No project file review or interviews were conducted for the remaining 18% of savings.
2. **In-depth interviews** (IDI) for an attempted census of projects for which project files have been provided by NYSERDA.
3. An industrial customer decarbonization **web survey** for an attempted census of all projects in the Industrial Process measure category, regardless of prior M&V or presence in the exclusion strata. This includes 102 projects representing 110 subprojects and 85% of population savings.

Table A-3 summarizes estimated completed data collection by stratum for the in-depth interviews and estimated relative precision of the results for two analyses: one including only projects for which we're able to complete an IDI, and one including results from desk reviews for all large projects and a sample of small projects.

For the IDI analysis, the sample assumes a 40% response rate to recruitment, with at least one complete in each sample cell for a total of 20 subprojects. The analysis of these 20 subprojects is projected to provide a population relative precision of 7.10% given the assumed error ratios. A risk to the projected relative precisions of the study depended upon recruitment of the large industrial process sites, since those four sites account for 50% of the savings in the IDI sample frame. For the desk review analysis, the sample targeted 25 subprojects, which projected to provide a population relative precision of 3.1% given the assumed error ratios.

Table A-3. File review and IDI sample by measure category

Measure category	M&V project	Number of projects	Size and category	Number of subprojects	Percent stratum savings	Percent population savings	Expected IDI completes - attempted census, 40% response rate	Number of projects with completed desk reviews	Assumed error ratio	Projected precision @ 90% confidence IDIs only	Projected precision @ 90% confidence all desk reviews
1. Data Center Processes	1. Yes	4	1. Large- M&V	3	49%	6%	1	3	0.10	N/A	0.0%
			1. Large- No M&V	1	10%	1%	1	1	0.28	0.0%	0.0%
		15	2. Small- M&V	14	40%	5%	6	6	0.10	6.5%	6.5%
			2. Small- No M&V	1	1%	0%	1	1	0.28	0.0%	0.0%
	Overall	**19**	**Overall**	**19**	**100%**	**13%**	**9**	**11**	**N/A**	31.8%	8.1%
2. Industrial Processes	1. Yes	4	1. Large- M&V	4	58%	50%	2	4	0.10	36.5%	0.0%
			1. Large- No M&V	2	1%	1%	1	2	0.37	N/A	0.0%
		14	2. Small- M&V	13	36%	31%	6	6	0.10	6.3%	6.3%
			2. Small- No M&V	5	5%	5%	2	2	0.37	143.1%	143.1%
	Overall	**18**	**Overall**	**24**	**100%**	**87%**	**11**	**14**	**N/A**	8.8%	3.9%
Overall		**37**	**Overall**	**43**	**N/A**	**100%**	**20**	**25**	**N/A**	7.1%	3.1%

Table A-4 summarizes estimated completed data collection by stratum for the web survey and estimated relative precision of the results. This survey attempted a census for all projects in the industrial process measure category. The sample assumed that all industrial process projects completing IDIs (Large and Small M&V) would respond to the web survey, with a rounded-up 10% response rate to web survey recruitment for all other strata. This assumption planned for a total of 22 survey completes expected in the final analysis sample. The analysis of these 22 surveys was projected to provide a population relative precision of approximately 22% for case weighted estimates and 17.5% for savings weighted estimates given the assumed CVs.

Table A-4. Web survey sample by measure category

Measure category	M&V project	Project size	Number of projects	Expected survey completes - attempted census	Assumed CV / response proportion	Case weighted expected precision @ 90% confidence	Savings weighted projected precision @ 90% confidence
Industrial Processes	1. Yes	Large	4	3	0.50	48.7%	48.7%
		Small	14	8	0.50	22.8%	22.8%
		Exclude	18	2	0.50	216.6%	216.6%
	2. No	Large	9	2	0.50	208.8%	208.8%
		Small	42	5	0.50	45.3%	45.3%
		Exclude	15	2	0.50	215.1%	215.1%
	Overall		**102**	**22**	**N/A**	**22.2%**	**17.6%**

Appendix B: Advance letters

Data center NDA

July 11, 2024

«Name», «Title»
«Company»
«Contact_Address»
«Contact_City», «Contact_State» «Contact_Zip»

Dear «Name»:
The New York State Energy Research and Development Authority (NYSERDA) is conducting an evaluation of its Industrial and Process Efficiency (IPE) Program to improve future offerings to the industrial and data center markets.

As a project participant in the IPE program since 2018, the «Project Description» project at «Company», «Contact_City», «Contact_State» is selected to participate in this important study.

NYSERDA has contracted the independent engineering firm DNV to conduct the evaluation. You will receive the following outreach from DNV:

1. A scheduled interview with a project engineer to review the achieved energy savings of this project.

A Non-Disclosure Agreement between «Company» and NYSERDA was previously completed for this project. If your company requires a Non-Disclosure Agreement with DNV to respond to these requests, DNV is prepared to quickly execute these agreements according to your needs.

We greatly appreciate you taking time to participate in the evaluation interview. No site visits or metering will be requested as part of this study. NYSERDA and DNV will keep the information private to the extent permitted by law, including but not limited to the Freedom of Information Law (FOIL). NYSERDA's analysis will only use summary data and will not identify individual respondents or firms.
Should you have any questions about this study, please feel free to contact «DNV Contact Name» of DNV («DNV Contact Phone» or «DNV Contact Email»), or if you prefer to speak with a NYSERDA representative, feel free to contact me at «NYSERDA Phone» or «NYSERDA Email». We look forward to working with you on this important study effort. Thank you in advance for your cooperation and understanding.

Sincerely,
«NYSERDA Name»
NYSERDA Project Manager

Data center non-NDA

July 10, 2024

«Name», «Title»
«Company»
«Contact_Address»
«Contact_City», «Contact_State» «Contact_Zip»

Dear «Name»:
The New York State Energy Research and Development Authority (NYSERDA) is conducting an evaluation of its Industrial and Process Efficiency (IPE) Program to improve future offerings to the industrial and data center markets.
As a project participant in the IPE program since 2018, the «Project Description» project at «Company», «Contact_City», «Contact_State» is selected to participate in this important study.
NYSERDA has contracted the independent engineering firm DNV to conduct the evaluation. You will receive the following outreach from DNV:

1. A scheduled interview with a project engineer to review the achieved energy savings of this project.

We greatly appreciate you taking time to participate in the evaluation interview. No site visits or metering will be requested as part of this study. NYSERDA and DNV will keep the information private to the extent permitted by law, including but not limited to the Freedom of Information Law (FOIL). NYSERDA's analysis will only use summary data and will not identify individual respondents or firms.
Should you have any questions about this study, please feel free to contact «DNV Contact Name» of DNV («DNV Contact Phone» or «DNV Contact Email»), or if you prefer to speak with a NYSERDA representative, feel free to contact me at «NYSERDA Phone» or «NYSERDA Email». We look forward to working with you on this important study effort. Thank you in advance for your cooperation and understanding.

Sincerely,
«NYSERDA Name»
NYSERDA Project Manager

Industrial NDA

July 12, 2024

«Name», «Title»
«Company»
«Contact_Address»
«Contact_City», «Contact_State» «Contact_Zip»

Dear «Name»:
The New York State Energy Research and Development Authority (NYSERDA) is conducting an evaluation of its Industrial and Process Efficiency (IPE) Program to improve future offerings to the industrial and data center markets.
As a project participant in the IPE program since 2018, the «Project Description» project at «Company», «Contact_City», «Contact_State» is selected to participate in this important study.
NYSERDA has contracted the independent engineering firm DNV to conduct the evaluation. You will receive the following outreach from DNV:

1. An email with a link to a survey to capture your insights on future program opportunities that would be of value to your company. We expect it will take less than 10 minutes to answer these questions.
2. A scheduled interview with a project engineer to review the achieved energy savings of this project.

A Non-Disclosure Agreement between «Company» and NYSERDA was previously completed for this project. If your company requires a Non-Disclosure Agreement with DNV to respond to these requests, DNV is prepared to quickly execute these agreements according to your needs.
We greatly appreciate you taking time to participate in the survey and evaluation interview. No site visits or metering will be requested as part of this study. NYSERDA and DNV will keep the information private to the extent permitted by law, including but not limited to the Freedom of Information Law (FOIL). NYSERDA's analysis will only use summary data and will not identify individual respondents or firms.
Should you have any questions about this study, please feel free to contact «DNV Contact Name» of DNV («DNV Contact Phone» or «DNV Contact Email»), or if you prefer to speak with a NYSERDA representative, feel free to contact me at «NYSERDA Phone» or «NYSERDA Email». We look forward to working with you on this important study effort. Thank you in advance for your cooperation and understanding.

Sincerely,
«NYSERDA Name»
NYSERDA Project Manager

Industrial non-NDA

July 16, 2024

«Name», «Title»
«Company»
«Contact_Address»
«Contact_City», «Contact_State» «Contact_Zip»

Dear «Name»:
The New York State Energy Research and Development Authority (NYSERDA) is conducting an evaluation of its Industrial and Process Efficiency (IPE) Program to improve future offerings to the industrial and data center markets.
As a project participant in the IPE program since 2018, the «Project Description» project at «Company», «Contact_City», «Contact_State» is selected to participate in this important study. NYSERDA has contracted the independent engineering firm DNV to conduct the evaluation. You will receive an email with a link to a survey to capture your insights on future program opportunities that would be of value to your company. We expect it will take less than 10 minutes to answer these questions. You may also receive outreach regarding a scheduled interview with a project engineer to review the achieved energy savings of this project.
We greatly appreciate you taking time to participate in the survey and evaluation interview. No site visits or metering will be requested as part of this study. NYSERDA and DNV will keep the information private to the extent permitted by law, including but not limited to the Freedom of Information Law (FOIL). NYSERDA's analysis will only use summary data and will not identify individual respondents or firms.
Should you have any questions about this study, please feel free to contact «DNV Contact Name» of DNV («DNV Contact Phone» or «DNV Contact Email»), or if you prefer to speak with a NYSERDA representative, feel free to contact me at «NYSERDA Phone» or «NYSERDA Email». We look forward to working with you on this important study effort. Thank you in advance for your cooperation and understanding.

Sincerely,
«NYSERDA Name»
NYSERDA Project Manager

Appendix C: Industrial customer decarbonization survey instrument

OVERVIEW

The overall goal of the survey is to provide Program Staff with an understanding of industrial process customer plans for decarbonization improvements, and opportunities for future NYSERDA interventions to assist in those improvements. The survey objectives are summarized in Table C-1.

Table C-1. Instrument goals

Question	Instrument Goal
Q7, Q11, Q12, Q13, Q14	Are participating entities planning energy projects beyond energy efficiency? Do those planned projects include electrification, carbon capture and storage, renewable fuels, or other decarbonization improvements? If yes, collect high-level project information and whether NYSERDA Program staff can follow up with them.
Q6, Q8	What is motivating participating entities toward decarbonization/ electrification?
Q9, Q10, Q15	What barriers have they experienced or anticipate? How might future NYSERDA program offerings assist in overcoming these barriers?
Q16, Q17, Q18, Q19	How do participating companies anticipate the New York Cap-and-Invest Program (NYCI) will impact them? Do they have plans to prepare?

Sampling plan: An attempted census of all projects in the Industrial Process measure category of the 2018-2024 Industrial Process Efficiency (IPE) Close-out Impact Evaluation sample frame, regardless of prior M&V or presence in the exclusion strata. This will include 102 projects representing 85% of population savings.

Method of data collection: A web survey (using Qualtrics) with limited phone callbacks.

- DNV will initiate a "soft launch" for customers who are not sampled for In-Depth Interview (IDI) through the IPE impact evaluation. The soft launch will gauge responses for

completeness and response rates to make adjustments to the outreach plan and survey format, as needed.

- DNV will send an invitation to the survey via email, and send up to two reminders to unresponsive participants, one week and two weeks from the initial invitation. The emails will be NYSERDA branded to increase credibility.
- Phone call-backs, at a minimum, will include survey completion for those customers we are able to recruit for a completed IDI within the industrial process group of 36 prior M&V projects.

Industrial Customer Decarbonization Survey - Email invitation

Subject: NYSERDA requests your input

Dear [CONTACT],

NYSERDA is seeking insights on future program opportunities that would be of value to organizations that participated in the Industrial and Process Efficiency (IPE) Program. This brief, 10-minute online survey will help us identify how NYSERDA can help you reach your energy savings and decarbonization goals.

Start Survey

[URL]

If you are unfamiliar with your organization's future energy efficiency and decarbonization plans, please share this email with a colleague at your organization who is best qualified to respond.

Your answers will be held in the strictest confidence. The information you provide will be combined with information from other companies that complete the survey. Individual company data will not be published. The results are reported in summaries such as group averages, percentages, and other general statistics.

DNV www.dnv.com is the research provider retained by NYSERDA to help administer this survey. DNV Energy is a company that specializes in energy research and analysis. If you have any concerns about the legitimacy of this survey, you can contact «NYSERDA Name» at «NYSERDA Email»

Technical issues? Reach out to «DNV Name».

Thanks in advance for your help!

Sincerely,

«DNV Name»

NYSERDA Industrial Process Efficiency Project Manager

DNV Energy Insights USA Inc.
«DNV Email»


DNV

Industrial Customer Decarbonization Survey – Survey Instrument

Introduction

We thank you in advance for providing information on ${e://Field/BUSINESS_NAME}'s future energy efficiency and decarbonization plans. This survey will take about 10 minutes to complete and will help us identify how NYSERDA can help you reach your energy savings and decarbonization goals. All responses will be kept completely confidential.

Let's get started!

Screening questions

1. "Are you familiar with the [BUSINESS_NAME]'s policies and near-future plans around energy efficiency and decarbonization?"

1	Yes	[SKIP TO Q3]
2	No	

2. Who at your organization is best to speak to about [BUSINESS NAME]'s policies and near-future plans around energy efficiency and decarbonization?

1	Name [VERBATIM]	[THANK AND TERMINATE-NEW CONTACT]
2	Phone [VERBATIM]	
3	Email [VERBATIM]	
-98	Prefer not to share [EXCLUSIVE]	[THANK AND TERMINAT-INELIGIBLE]

Motivation and barriers to decarbonize

3. Which, if any, of the following policies does [BUSINESS_NAME] have? Select all that apply. [RANDOMIZE 1-6]

1	Defined ESG goals or report
2	Energy master plan
3	Defined energy reduction goals
4	Defined carbon reduction goals
5	Sustainability committee/department
6	Corporate sustainability policy
7	None [EXCLUSIVE]
8	Other, please specify: [VERBATIM]
-97	Don't know [EXCLUSIVE]

4. Does [BUSINESS_NAME] have any current interest in, plans, or activities to electrify and/or decarbonize operations beyond its prior IPE program participation? These could include:

- Electrification (shifting from fossil fuel to electric energy)
- Carbon capture and storage
- Renewable fuel projects (such as fuels from plant matter, animal fats, waste products, carbon dioxide, and carbon monoxide)
- Energy efficiency (projects beyond the past participation in the IPE program)
- Other greenhouse gas reduction project

[FORCE RESPONSE]

1	Yes	
2	No	[SKIP TO Q13]
-97	Don't know	[SKIP TO Q13]

5. What are [BUSINESS_NAMES]'s motivations to decarbonize? Select all that apply. [MULTI-CHOICE]

1	The company policy(s) indicated previously in this survey
2	Lower energy bills
3	Improve productivity or process efficiencies
4	Ensure systems are operating optimally
5	Lengthen equipment longevity
6	Enhance occupant comfort or safety
7	Address occupant requests
8	Identify simple improvements
9	Enhance reliability and uptime
10	Aligning with future state and federal policies and regulations
11	Improve company's profitability

12	Our clients require that we decarbonize
11	Other, please specify: [VERBATIM]
-97	Don't know [EXCLUSIVE]

6. Other than cost, what challenges, if any, limit [BUSINESS_NAME] from taking action to electrify and/or decarbonize? Select all that apply. [MULTI-CHOICE] [FORCE RESPONSE]

1	Relevant projects not identified
2	Lack of supportive corporate policies
3	Resistance from upper management
4	Costs outweigh benefits
5	Return on investment too low
6	Shortage of contractors to plan/spec projects
6	Material supply chain shortages / equipment not available on market
7	Shortage of contractors to implement projects
8	Risk of operations disruptions
9	Have not been able to schedule good time to implement project
10	Other, please specify: [VERBATIM]
11	Nothing/No challenges [EXCLUSIVE]
-97	Don't know [EXCLUSIVE]

7. [IF Q6 ≠0,97 0, same page] What resources or services could NYSERDA offer to help overcome these challenges?

1	[VERBATIM]
-97	Don't know
-98	Prefer not to say

Identifying additional projects

[Format note: the below chart will be programmed in Qualtrics across two side-by-side charts. First chart includes project number, project description, category. Second chart includes remaining fields.]

8. Please provide more information for up to five planned/in progress [BUSINESS_NAME] electrification/decarbonization projects in New York State.

For each project, please provide a one sentence description, and select a category from the drop down.

[second table: For each project you entered in the last table, please indicate the current stage, estimated completion date, and the location of each project. If you have fewer than five projects, leave rows blank. If you have greater than five projects, please choose the most significant ones.

[IF NO PROJECT ENTERED, SKIP TO Q13]

[SIDEBYSIDE RESPONSE]

Project Number	Project Description	Category	Stage	Expected completion date (MM/YYYY)	Location (Street Address, City)	Project size (In dollars)
1	<<ONE LINE TEXT FIELD>>	<<DROPDOWN SELECT>> 1 Electrification project(s) (Industrial heat pumps in the manufacturing process, electric boiler) 2 Carbon capture and storage project(s) 3 Renewable fuel project(s) (RNG,/ New Category: Low Carbon Fuels- Hydrogen) 4 Energy efficiency project(s) beyond those that participated in the IPE program (Thermal reduction projects) 5 Other greenhouse gas emission	<<DROPDOWN SELECT>> 1 Project planning expected within the next 3 years 2 Planning stage 3 Design stage 4 Construction stage -97 Don't know -98 Prefer not to say	<<MONTH+YEAR SELECTOR>>	<<SHORT ANSWER TEXT>>	

		reduction project(s) not covered by previous options 5 Other -97 Don't know				
2	<<ONE LINE TEXT FIELD>>	<<DROPDOWN SELECT>>	<<DROPDOWN SELECT>>	<<MONTH+YEAR SELECTOR>>	<<SHORT ANSWER TEXT>>	
3	<<ONE LINE TEXT FIELD>>	<<DROPDOWN SELECT>>	<<DROPDOWN SELECT>>	<<MONTH+YEAR SELECTOR>>	<<SHORT ANSWER TEXT>>	
4	<<ONE LINE TEXT FIELD>>	<<DROPDOWN SELECT>>	<<DROPDOWN SELECT>>	<<MONTH+YEAR SELECTOR>>	<<SHORT ANSWER TEXT>>	
5	<<ONE LINE TEXT FIELD>>	<<DROPDOWN SELECT>>	<<DROPDOWN SELECT>>	<<MONTH+YEAR SELECTOR>>	<<SHORT ANSWER TEXT>>	

9. [IF ONLY ONE PROJECT INFORMATION FILLED IN, SKIP TO Q14] Which of those projects is the most significant one for [BUSINESS_NAME]?

1	Project 1 <<PIPE TEXT FROM PROJECT DESCRIPTION OF PREVIOUS TABLE>>
2	Project 2 <<PIPE TEXT FROM PROJECT DESCRIPTION OF PREVIOUS TABLE>>
3	Project 3 <<PIPE TEXT FROM PROJECT DESCRIPTION OF PREVIOUS TABLE>>
4	Project 4 <<PIPE TEXT FROM PROJECT DESCRIPTION OF PREVIOUS TABLE>>
5	Project 5 <<PIPE TEXT FROM PROJECT DESCRIPTION OF PREVIOUS TABLE>>
-97	Don't know
-98	Prefer not to say

10. [IF Q9=1-5] What makes this project the most significant? [CHOOSE ALL THAT APPLY] [FORCE RESPONSE]

1	Most costly
2	Greatest GHG impact
3	Greatest impact on operations
4	Most important to upper management

5	Other, please specify: [VERBATIM]
-97	Don't know
-98	Prefer not to say

11. What type of assistance do you need to move these projects forward? [CHOOSE ALL THAT APPLY]

1	Technical design assistance
2	Technical analysis (cost/benefit)
3	Planning or implementation solicitation support (RFP creation)
4	Financial assistance
5	Workforce development
6	None [EXCLUSIVE]
-97	Don't know [EXCLUSIVE]
-98	Prefer not to say [EXCLUSIVE]

12. If NYSERDA were to follow up with [BUSINESS_NAME] to discuss how they could help with any of these project(s), who is the best person to contact?

1	Myself
2	Someone else [VERBATIM]
3	Not interested in a follow up from NYSERDA

13. NYSERDA offers several programs that support industrial businesses. Are you aware and/or interested in learning more about the following programs?

	Aware	Interested in learning more	[BUSINESS_NAME] Participated
a. C&I Carbon Challenge [hyperlink: Commercial & Industrial (C&I) Carbon Challenge - NYSERDA] The C&I Carbon Challenge provides financial support to companies and organizations implement carbon-reduction projects through a competitive proposal process. Challenge winners will work one-on-one with a dedicated NYSERDA resource on all proposed projects rather than navigating multiple NYSERDA or utility initiatives.	Yes/No	Yes/No	Yes/No/Don't Know
b. FlexTech Program (https://www.nyserda.ny.gov/All-Programs/FlexTech-Program) - Provides cost-share technical assistance to industrial facilities to help identify decarbonization solutions. Standard cost share is 50% for eligible projects. Currently, Industrial projects that are either located in a Disadvantaged Community			

	Aware	Interested in learning more	[BUSINESS_NAME] Participated
(https://www.nyserda.ny.gov/ny/Disadvantaged-Communities) or that study an electrification measure are eligible for 75% cost share.			
c. On-site Energy Manager [https://www.nyserda.ny.gov/All-Programs/On-Site-Energy-Manager] Standard cost share is up to 75% of costs for hiring an on-site energy manager to identify and implement energy and operational upgrades. Industrial sites located in Disadvantaged Communities (https://www.nyserda.ny.gov/ny/Disadvantaged-Communities) are eligible for up to 100% cost share at program caps while funds allow. Caps are $200,000 for sites with >$1 million annual energy spend and $100,00 for sites with <$1 million annual energy spend.			
d. Strategic Energy Management (hyperlink: Strategic Energy Management - NYSERDA) Provides free energy coaching and guidance to industrial customers to assist in learning and managing energy strategically across the company			
e. Federal Programs (probe to see if tax credits (48C etc) or other grant opportunities are being pursued). Small Medium Manufacturers that have completed either an Industrial Assessment Center or FlexTech study and install recommended measures may be eligible for DOE Implementation Grants (https://www.energywerx.org/opportunities/iacimplementationgrants).			

14. Which, if any, of the following federal programs has [BUSINESS] considered or participated in?

	Considered	Participated
a. Implementation Grants opportunity (hyperlink: https://www.energy.gov/mesc/industrial-research-and-assessment-center-implementation-grants)	Yes/No	Yes/No
b. Qualifying Advanced Energy Project Cred (48C) Program (hyperlink: https://48c-exchange.energy.gov/)	Yes/No	Yes/No
c. Other, please specify: [VERBATIM]	Yes/No	Yes/No
d. Other, please specify: [VERBATIM]	Yes/No	Yes/No
e. Other, please specify: [VERBATIM]	Yes/No	Yes/No

New York Cap-and-Invest Program

15. Are you aware of the proposed New York Cap-and-Invest (NYCI) Program [hyperlink: New York Cap-and-Invest - New York's Climate Leadership & Community Protection Act (ny.gov)]? [FORCE RESPONSE]

1	Yes	
2	No	[SKIP TO CLOSE]

16. Which of the following best describes how much you know about the proposed New York Cap-and-Invest Program?

1	Have heard of it, but not sure what it is
2	Some knowledge, but not sure how it will affect [BUSINESS_NAME]
3	We are actively assessing how it will affect [BUSINESS_NAME]
4	We have a good idea how much it will affect [BUSINESS_NAME]
5	We are making or have made plans to change operations in response to it

17. Will ${e://Field/BUSINESS_NAME} be an Obligated Entity under the NYCI program?

1	Yes	
2	No	[SKIP TO END OF SURVEY]
-97	Don't know	[SKIP TO END OF SURVEY]
-98	Prefer not to say	[SKIP TO END OF SURVEY]

18. How is [BUSINESS_NAME] preparing for the New York Cap-and-Invest Program?

1	[VERBATIM]
-97	Don't know
-98	Prefer not to say
-97	Don't know
-98	Prefer not to say

[CLOSE] Those are all the questions we have. NYSERDA thanks you for your time.

[THANK AND TERMINATE – INELIGIBLE]

That is all the questions we have for you today. Thank you for your time and responses. We apologize that your facility is not eligible to participate in this survey.

[THANK AND TERMINATE – NEW CONTACT]

That is all the questions we have for you today. Thank you for your time and responses. We will follow up with the alternate contact that you provided.

Appendix D: Industrial customer decarbonization survey results

Figure D-1 through Figure D-5 summarize the survey responses to the industrial customer decarbonization survey. These responses are referenced in Section 2.1.3.

Figure D-1. DAC status of survey responses

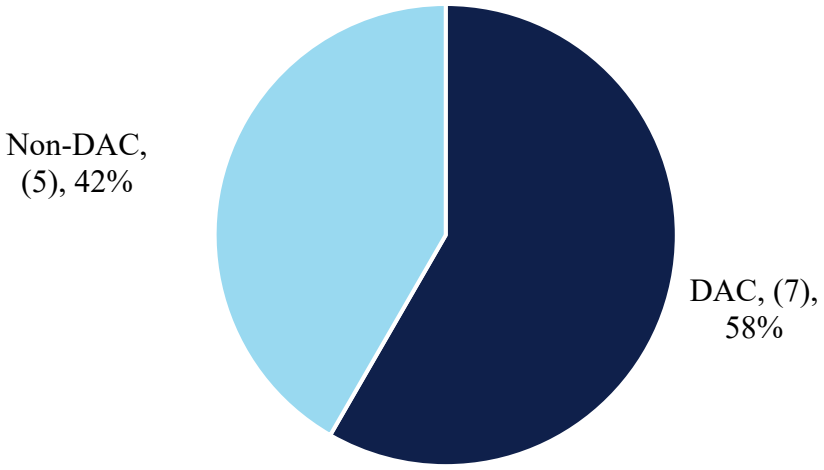


Figure D-2. Challenges regarding electrification or decarbonization

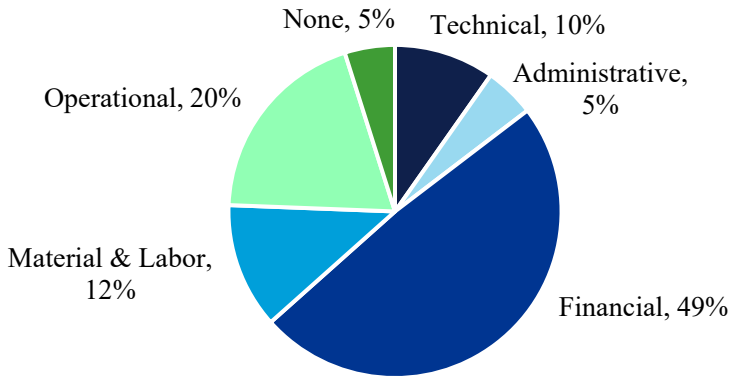


Figure D-3. Assistance needed to move projects forward

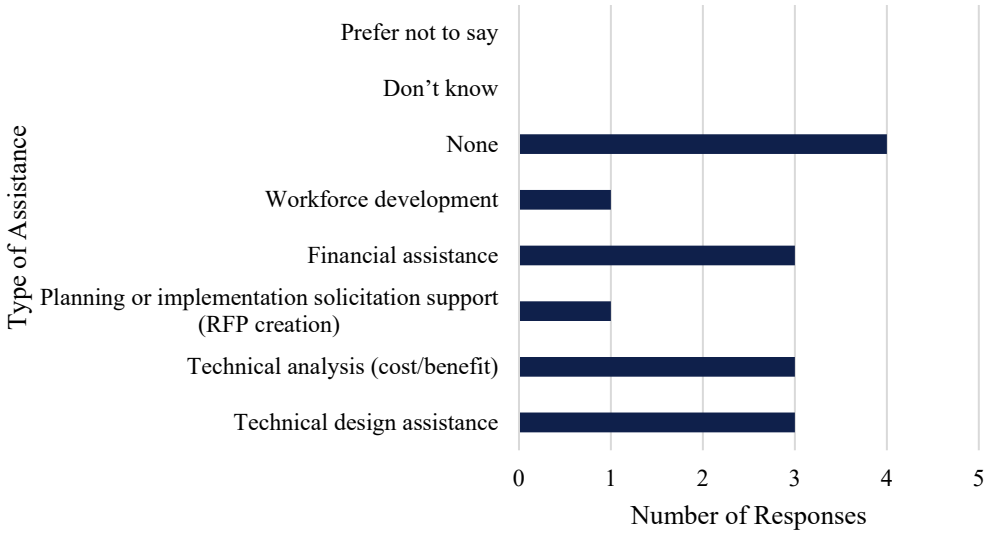


Figure D-4. Awareness of NYSERDA programs for industrial businesses

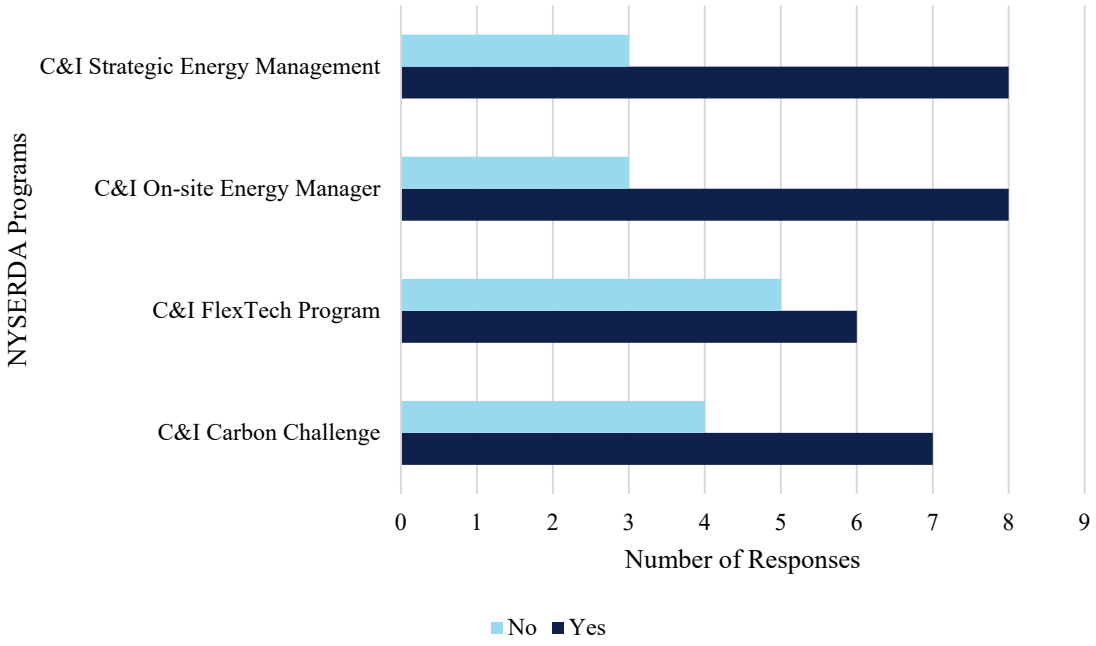
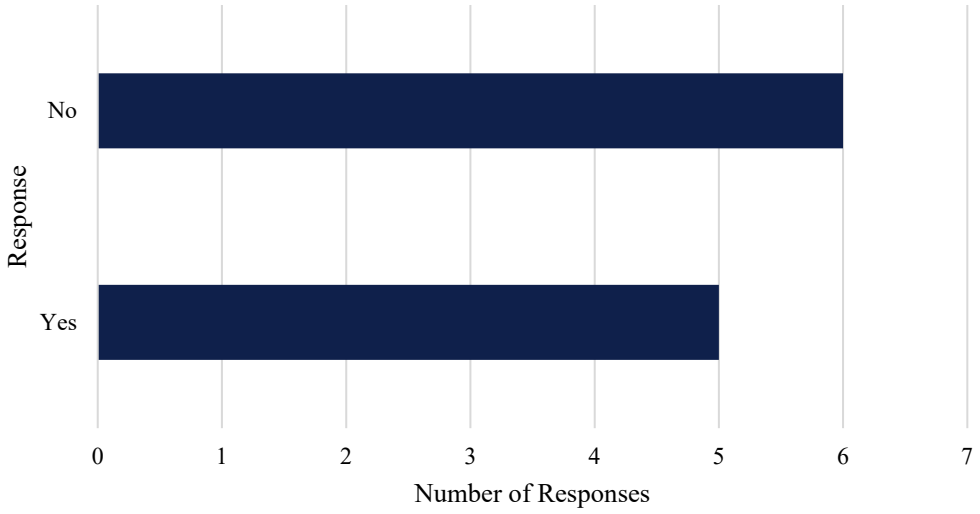


Figure D-5. Awareness of NYCI program



Appendix E: Site-specific results

Site ID	Project category	Project size	Reported electricity savings MWh	Evaluated electricity savings MWh	Reported fossil fuel savings MMBtu	Evaluated fossil fuel savings MMBtu
DNV-03	Industrial Processes	Small	1,173	(263)	55,854	55,854
DNV-05	Industrial Processes	Small	2,648	2,648	117,775	117,694
DNV-06	Data Center Processes	Small	729	431	-	-
DNV-14	Industrial Processes	Small	20,506	20,445	-	-
DNV-15	Industrial Processes	Small	21,235	21,298	-	-
DNV-17	Industrial Processes	Small	-	56	38,456	38,338
DNV-22	Data Center Processes	Small	4,365	3,706	-	-
DNV-37	Industrial Processes	Small	1,334	1,334	1,265	1,265
DNV-38	Data Center Processes	Small	491	-	-	-
DNV-51	Data Center Processes	Small	1,432	1,445	-	-
DNV-58	Industrial Processes	Small	3,385	3,385	-	-
DNV-59	Industrial Processes	Small	2,996	2,996	3,412	3,412
DNV-62	Industrial Processes	Large	-	-	281,407	223,922
DNV-68	Data Center Processes	Small	1,008	918	-	-
DNV-73	Data Center Processes	Small	2,523	2,331	-	-
DNV-79	Industrial Processes	Small	7,643	7,643	53,029	53,029
DNV-92	Industrial Processes	Small	19,037	19,041	-	-
DNV-94	Data Center Processes	Small	1,965	1,546	-	-
DNV-95	Data Center Processes	Large	8,220	1,861	-	-
DNV-110	Industrial Processes	Small	-	-	38,469	38,469

Site ID	Project category	Project size	Reported electricity savings MWh	Evaluated electricity savings MWh	Reported fossil fuel savings MMBtu	Evaluated fossil fuel savings MMBtu
DNV-112	Data Center Processes	Small	3,548	3,434	-	-
DNV-114	Industrial Processes	Large	3,781	3,781	124,716	124,716
DNV-118	Data Center Processes	Small	2,369	1,813	-	-
DNV-141	Industrial Processes	Small	2,019	2,019	14,230	14,230
DNV-142	Data Center Processes	Small	840	831	-	-
DNV-152	Data Center Processes	Large	14,358	18,896	-	-
DNV-153	Industrial Processes	Small	-	(172)	39,212	39,212
DNV-154	Data Center Processes	Large	11,274	7,998	-	-
DNV-155	Data Center Processes	Small	3,210	3,397	-	-
DNV-156	Data Center Processes	Small	1,97	2,434	-	-
DNV-157	Data Center Processes	Small	1,297	1,492	-	-
DNV-158	Data Center Processes	Small	1,931	2,495	-	-
DNV-159	Data Center Processes	Small	959	951	-	-