NYSERDA CRE Tenant Measure Adoption Rate Survey

Interim Report

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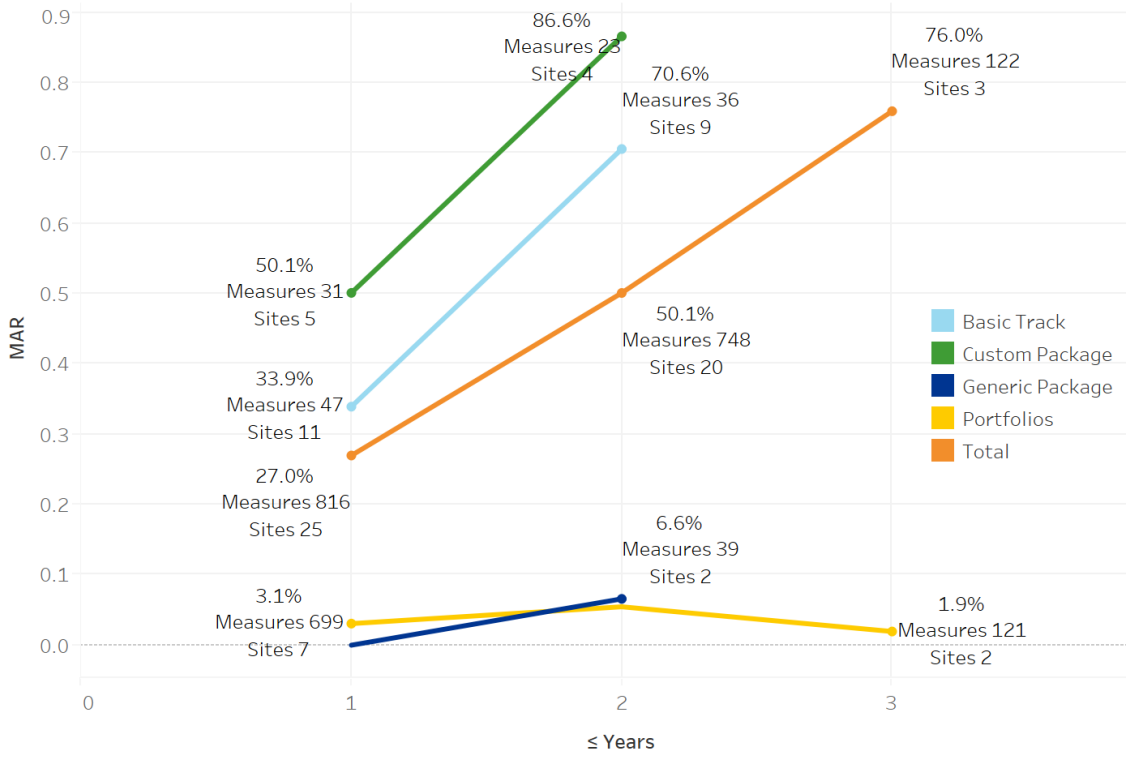
1 Executive Summary

This report presents interim results of the CRE Tenant Program Measure Adoption Rate Survey, including the self-reported measure adoption rates (MAR) and other findings from the online and phone verification effort. Note that verified energy savings and realization rate determination are not part of the scope of this study, as it is part of a separate contract for "CEF Commercial Impact Evaluation".

Through December 11, 2019, the evaluation finds that CRE Tenant program participants installed 44.9% of the savings (kWh) recommended from inception of the program in 2016 through April 30, 2019. The result is based on self-reports of measure installation and estimated energy savings in program tracking data.

Figure 1 shows the measure adoption curve for distinct program offerings and the overall CRE Tenant Program. Years are measured as within X years of recommendation. The program offering mix seems to be a primary driver of the overall MAR because custom package (a high performance track offering, 86.6%) and basic track (70.6% after 2 years) show much greater measure adoption of recommended savings in the two-year timeframe than either the portfolio or the generic package. Both custom package and basic track adoption rates are considerably higher than the FlexTech program evaluated in 2018 (28.0%) two years after its energy audits. The FlexTech MAR began to level off at about 65% after 6 years, however these program tracks may have already reached a leveling point, as FlexTech had a slower adoption rate with more room to grow in early years.

Figure 1: Self-Reported Combined[1] Energy (kWh) Measure Adoption Curves by Program Offering



2 Introduction

This report presents interim results of the CRE Tenant Program Measure Adoption Rate (MAR) Survey. The Measure Adoption Rate quantifies the percentage of study-recommended savings that customers chose to adopt. This report provides the self-reported MAR and other findings from the online and phone verification effort.

The first round of data collection activities ('Round 1') for the survey findings discussed in this interim report were launched in August 2019. The targeted sample frame included CRE Tenant program participants from inception in 2016 through April 30, 2019.

An additional round of data collection ('Round 2') is anticipated for launch in mid- to late-2020 to capture incremental measure adoption occurring after this initial evaluation period, and based on participation criteria to be agreed upon by NYSERDA and the evaluation contractor. This next round is primarily intended to pull in non-respondents from Round 1, which may have not

[1] While Combined Energy (kWh) represents the estimated energy savings for both electric and non-electric measures, no recommended non-electric measures were installed as of this report.

adopted yet, as well as those with near-term planned partial installations and stated installations. Round 2 may also expand the evaluation time window to capture more results for portfolio participants, who have only been eligible since the most recent (April 2019) program revision, as well as other participants coming into the program after April 30, 2019.

2.1 Program Description

NYSERDA's Commercial Tenant Program supports commercial office tenants, commercial landlords (building owners and managers), and architecture/engineering firms in improving interior office and leased spaces through thoughtful design, proactive maintenance and operations, and actionable plans to reduce energy consumption in existing buildings. The program intends to demonstrate a cost-effective approach to energy efficient high-performance office space to tenants while also supporting building owners with a cost- effective and replicable approach to delivering those spaces. At any point in the leasing cycle, the program helps cover the cost of identifying energy saving opportunities and to plan the implementation of energy efficiency measures in leased office spaces. The program covers up to 100% of the consultant's eligible professional service fees.

Fundamentally, through PON 3308: Commercial Tenant Program[2], NYSERDA is encouraging building owners, managers and tenants to work together to achieve energy efficiency in commercial buildings by providing energy modeling and services via cost-share. This initiative will test the ability to standardize energy efficiency packages for tenant spaces within commercial buildings.

Since its inception in 2016, the PON has been modified three times; in 2017, 2018, and April 2019.

The CRE Tenant program currently offers two participation tracks based on the existing conditions of the office space and the tenants' goals. Within each track different energy efficiency packages are offered, as described below (per 2018 revisions to PON 3308, Clean Energy Fund Investment Plan Commercial Chapter).

High Performance Track: Offering participants the option of developing an energy efficiency package for their office space, the track consists of a detailed energy analysis or energy model, a list of recommended energy efficiency and optimization measures, and a detailed financial analysis. The package presents various options or combinations of measures, taking into

[2] https://www.nyserda.ny.gov/All-Programs/Programs/Commercial-Tenant-Program

consideration their interactive effects, incremental cost impacts, and energy savings over the length of the lease. The track is intended for participants interested in "above code" solutions that will drive best practices in the industry.

Funding: NYSERDA provides up to 50% of the costs to generate the energy efficiency package, capped at $50,000 per energy efficiency study. If a tenant or landlord installs recommended measures from the package, NYSERDA will reimburse energy consultants the remaining portion of technical assistance costs if installation criteria are met. Measure adoption for high performance track projects must occur within two years of purchase order issuance date.

- Custom Package: Developed for a specific tenant office space in a specific building and includes a detailed energy analysis or energy model of the space, a list of measure recommendations and a detailed financial analysis. It is intended to inform the office space design or comprehensive improvement of the space. It considers the tenant's unique requirements, performance targets and sustainability goals. This package is most commonly developed for tenants.

- Generic Package: Standard energy analysis developed for a "typical" office space in a specific building. The option exists for landlords interested in facilitating a conversation about energy efficiency with their tenants – both new and existing. It includes a detailed energy analysis or energy model of the typical office space, a list of recommended measures based on the characteristics of the base building systems, and a financial analysis.

Basic Track (100% cost share capped at $5,000 per assessment per office space): This track is best suited for tenants who are interested in gaining a general understanding about their energy efficiency status and identify ways to improve their energy and environmental performance. The approach consists of a basic energy efficiency assessment to identify energy saving opportunities, benchmarking, goal setting and other relevant activities needed to help the tenant plan for next steps in their energy efficiency improvement process. This track is appropriate for tenants who may not have much time remaining on their lease, tenants occupying a small-to-medium size office space, or tenants who wish to take a more incremental approach to implementing energy efficiency measures in their office space.

Portfolio (introduced April 2019): This track is applicable to tenants with multiple spaces, or landlords with multiple buildings, and provides additional resources including and beyond opportunity assessments and planning assistance. (Individual program specialists will create a

unique strategy to support the assessment and implementation of energy measures at the portfolio level, including tenants or employee engagement.)

2.2 Summary of Evaluation Objectives and Methods

The evaluation objectives and main research for this study are outlined in Table 1. The primary objective of the CRE Tenant MAR survey are to estimate MAR by year, with a 10% confidence interval at the 90% probability level.

Table 1: Evaluation Objectives and Main Research Questions

Objective	Impact Evaluation Question(s)	Data Source(s) & Analytic Method(s)
Participant self-reported program and individual measure adoption rate (MAR)	Which measures have been adopted that have resulted from program activities (i.e. modeling, energy efficiency package, energy audit, etc.)	Survey of participating building owners, managers, and tenants by evaluation contractor
	What is the number of CRE building owners and managers offering building-specific packages?	
	How many tenant spaces and buildings are participating?	
	What is the square footage of participating tenant spaces? *	
Participant self-reported energy savings	What are the direct energy savings attributable to program activities and associated with the participant self-reported measure adoption?	Survey of participating building owners, managers, and tenants by evaluation contractor, program data
Precision	The sample designs are expected to meet at a minimum a target of 10% precision level for Program gross energy savings at 90% confidence.	NA

*Square footage data in the program tracking database was not sufficiently populated to complete this objective in Phase 1 of the MAR evaluation. Round 2 data collection will include square footage since tracking was implemented in early 2019.

Table 2 provides an overview of primary data collection activities. DNV GL conducted a participant survey (online with phone follow-up) to help determine uptake of initiative participants and installed measures. Those participants who installed measures received follow-up emails to collect utility account information and acquire permission to possibly conduct future on-site M&V.

Table 2: Overview of Primary Data Collection Activities

Research Approach	Target Group/ Population	Population Size (projects)	Sampling Method	Primary Sampling Unit	Stratification
Evaluation Contractor MAR Survey	CRE participants (building owners, managers, and tenants)	74	Census	Project	Year, fuel type, location, program offer (Custom, Generic, Basic)

MAR results are based on self-reports of measure installation and estimated energy savings in program tracking data.

3 Results, Findings, and Recommendations

3.1 Results

The quantitative results and observations of the data collection and analysis activities are detailed in this section.

3.1.1 Data Review Observations

The evaluation team worked with NYSERDA program staff early in the evaluation to review available tracking data availability and quality relative to the goals of the evaluation. Qualitative observations of data limitations and potential improvements are detailed below.

Table 3: Data Review Observations and Recommendations

#	Finding	Recommendation
1	We identified measure module improvement opportunities to improve evaluation and data management. 1) Measure descriptions were usually provided in a notes field that had a mix of quality descriptions. Descriptions understandable to the customer are a key need for evaluation of this program and ideally would be stored in a dedicated field. 2) The measure module has twelve different measure types as well as a notes field that often provides more detailed measure descriptions as well as other pertinent information, but is not always filled in.	For programs using Salesforce CRM and the measure module (including NYSERDA programs beyond CRE Tenant), we recommend adding an additional field with standardized detailed measure names. This would allow the programs to track recommended measures more easily and will allow future evaluations to report on adoption rates by measure type. To address 2), the program might also consider a dedicated field for tracking a lay person description of the measure in addition to the notes field. This will improve future evaluability and internal reporting capabilities.
2	Square footage data in the program tracking database was not sufficiently populated to complete the "square footage of participating tenant spaces" objective, and the available data showed evidence of inaccuracy.	The evaluation team recommended that the program collect and/or confirm square footage data through customer surveys to meet this objective. Program staff indicated that this change has been in effect since early 2019. We recommend that program staff review the available data prior to the requirement.
3	We identified several data entry issues, including duplicate measures, missing measures, measures assigned to the wrong site, and measures that should have savings missing savings while working with program staff during the data preparation process.	Particularly for complex projects with many tenant spaces, we recommend the program implement a data entry process where two people enter the data independently and then compare results. This could be done in a spreadsheet or through a different method. 1) Program staff indicated that the following procedures are in place, consistent with the evaluation's recommendation. "A QA/QC process was instituted in early 2019 to verify accuracy and completeness of project information and measure-level detail on a quarterly basis." 2) "Technical reviewers have been trained in the data entry process, including how to accurately capture all relevant measure-level data in the Salesforce platform."

#	Finding	Recommendation
4	The program currently tracks two dates: the project approval date (P.O. date) and the date the site reports are approved by NYSERDA. Based on reviewing site reports for respondents who indicated they had installed measures prior to the project approval date, we identified that in some cases the site report was dated well before the project approval date.	As it is likely that the contractor provided the report to the landlord or tenant shortly after the audit and near the date of the site report, the program may want to consider recording the date of the audit or the date the site report was initially issued to more accurately track the adoption rate.
5	Some contractors provided the landlord or tenant with multiple mutually exclusive options.	The program may want to consider creating a flag or an additional measure status for identifying which recommended measures are mutually exclusive. Program staff indicated that the following procedure is in place, consistent with the evaluation's recommendation. "As part of the QA/QC process, technical reviewers were issued guidance on recording measure-level status. For mutually exclusive measures, the recommended measure is to be listed as "Recommended" (with RME listed in the Notes section), and the other measure is to be entered as "Completed" which is the status used in Salesforce to identify measures needing further study or mutually exclusive measures (with ME listed in the Notes section), along with any clarifying notes."
6	Some contractors recommended measures with no savings or only negative savings that would benefit the landlord or tenant in other ways.	Future evaluations should track reasons for zero or negative energy savings and the non-energy or indirect benefits of these recommendations.

3.1.2 Data Collection Results and Observations

Because some projects have multiple sites with multiple tenants, and individual contacts can have multiple sites receiving program assistance, the evaluation team summarized participation data in terms of participants, points of contact, projects, sites, and measures, as well as total projected electric and non-electric savings.

The achieved MAR survey sample is shown in Table 4 by counts of measures, projects, and contacts in the population, those with completed surveys, and the percent of the population with completed surveys. In Table 4, the achieved MAR survey sample is shown in terms of projected electric and non-electric savings. However, no recommended non-electric measures were installed as of this report.

Table 4: Data Collection Survey Completion Rates by Measure, Project, and Contact

Data Collection Group	Measures			Projects			Sites			Contacts		
	Population	Survey Response Rate	Installs	Population	Survey Response Rate	Installs	Population	Survey Response Rate	Installs	Population	Survey Response Rate	Installs
Landlord Multi-site Basic and Generic[3]	81	47%	1	10	60%	1	13	46%	1	4	50%	1
Landlord Portfolios[4]	693	100%	15	9	100%	4	122	100%	13	5	100%	2
Landlord Single site Basic and Generic	54	48%	13	8	50%	3	8	50%	3	8	50%	3
Tenant Custom	105	31%	26	11	45%	5	11	45%	5	11	45%	5
Tenant Basic and Portfolio	179	28%	7	36	25%	4	45	24%	4	41	22%	4
Total	**1112**	**76%**	**62**	**74**	**45%**	**17**	**199**	74%	**26**	**69**	**36%**	15

Table 5: Data Collection Survey Completion Rates by Projected Electric and Non-electric Savings[5]

Participant Group	Total Savings (MMBTU)			Electric Savings (kWh)		
	Population	Completed Surveys	Response Rate	Population	Completed Surveys	Response Rate
Landlord - Multi-site Basic and Generic	3,462	1,610	47%	901,495	395,805	44%
Landlord - Portfolios	41,696	41,696	100%	9,541,778	9,541,778	100%
Landlord - Single site Basic and Generic	3,042	3,053	100%	1,590,716	907,279	57%
Tenant - Custom	18,283	12,677	69%	6,046,186	3,715,409	61%
Tenant - Basic and Portfolio	12,464	3,977	32%	3,558,079	1,135,297	32%
Total	**78,946**	**63,013**	**80%**	**21,638,254**	**15,695,568**	**73%**

[3] Multi-site Basic and Generic category includes projects in the basic and generic tracks where the participant is a landlord with multiple projects.

[4] The portfolio mechanism was introduced to the program in 2019. The portfolio track inherently includes multiple projects under a single landlord participant.

[5] While no non-electric recommended measures were installed as of this report, the installation of electric measures resulted in a few adjustments to non-electric energy use. Therefore, we provide both MMBTU and kWh results.

Building owners and managers are included in the "landlord" category of participants. Nineteen projects have been completed by landlords with multiple project sites (either basic, generic, or portfolio), of which five projects have resulted in installation of sixteen measures. Another eight building projects completed by landlords with a single site have resulted in three project installations of thirteen measures. Sixteen tenant spaces at fourteen tenant buildings are participating in the program, of which nine project installations have resulted in 33 installed measures.

Overall, the Phase 1 data collection effort gathered responses for 36% (25 of 69) contacts, representing 76% of measures, 45% of projects, and 80% of total projected savings. The landlord groups were more responsive than tenant groups, though tenants with custom projects were more responsive (45% response rate) than those with basic or generic projects (22% response rate). Tenants with basic or generic projects also represents the largest number of contacts (41) and projects (36); Phase 2 data collection will seek to increase response rate for this group through alternative methods, such as financial incentives and/or customer reports.

Portfolio projects, while only offered starting in April 2019, account for the greatest proportion of activity in the program, with considerably higher number of measures recommended than other groups, and roughly two-thirds of program projected total and electric savings. These savings and measures were recommended to five participants with nine projects. Landlords with portfolio projects were also more likely to respond to the survey (100% response rate).

Table 6 shows measure installation counts by end use category for program offerings and overall. Lighting and lighting controls have the highest installation count, followed by HVAC and HVAC controls.

Table 6: Measure Installation Counts by End Use Category

End Use Category	Installed Measures				
	Basic Track	Custom Package	Generic Package	Portfolios	Overall
Building Controls and Automation		3	1	2	6
Building Envelope/Shell	2	1			3
Domestic Hot Water/Service Water Heating		2			2
HVAC and HVAC Controls	7	5		6	18
Indirect Savings		1			1
Lighting and Lighting Controls	7	8	2	7	24
Plug Load (computers, monitors, printers, lamps, TV, smart boards, appliances, etc.)	2	5			7
Process Loads (Other Unregulated Loads)		1			1
Total	**18**	**26**	**3**	**15**	**62**

3.1.3 Analysis Results and Observations

3.1.3.1 Cumulative Measure Adoption Rate Results

Through December 11, 2019 (Phase 1 data collection termination), the evaluation found that the CRE Tenant program installed 44.9% of the savings (kWh) recommended from inception of the program in 2016 through April 30, 2019.

The results in this section show cumulative measure adoption rates for each year after measure recommendation in terms of percent of recommended combined energy (kWh) savings that were installed.[6] The date of recommendation is taken from the Purchase Order date tracked by the program. While results are reported for combined energy (kWh) savings, none of the recommended non-electric measures were installed.

Table 7 shows the overall CRE Tenant Program MAR for each year after recommendation in comparison to the FlexTech program evaluated in 2018. The CRE Tenant program measures are being installed at a faster overall rate relative to FlexTech, at year two exceeding the FlexTech MAR for year four.

Table 7: Cumulative CRE Tenant MAR Comparison to FlexTech

Program	<=Year						
	1	2	3	4	5	6	7
CRE Tenant	27.0%	50.1%	*	-	-	-	-
FlexTech	16.8%	28.0%	38.8%	46.6%	54.6%	64.4%	65.9%

*CRE Tenant program MAR for year three after recommendation is currently based on too few customer interviews for inclusion here.

Figure 2 shows the measure adoption curve for distinct program offerings and the overall CRE Tenant Program. Years are measured as within X years of recommendation. The program offering mix seems to be a primary driver of the overall MAR because custom package (a high performance track offering, 86.6%) and basic track (70.6% after 2 years) show much greater measure adoption of recommended savings in the two-year timeframe than either the portfolio or the generic package. If the program were to shift toward portfolio-based, the MAR could decrease in the short term. Future evaluations will help to show long term performance for portfolios and multisite generic packages, which could show increasing adoption over time as capital budget expenditures are available to building owners. There may be potential to push uptake by following up with multisite generic and portfolio customers over time. Future evaluations could

[6] Combined energy is the total energy savings recommended/installed. The units used were end-use kWh. While Combined Energy (kWh) represents the estimated energy savings for both electric and non-electric measures, no recommended non-electric measures were installed as of this report.

seek to understand whether installation is included in longer term planning of capital budgets, or if they choose not to install, the reasons for their decision.

Figure 2: Self-Reported Combined Energy (kWh) Measure Adoption Curves by Program Offering

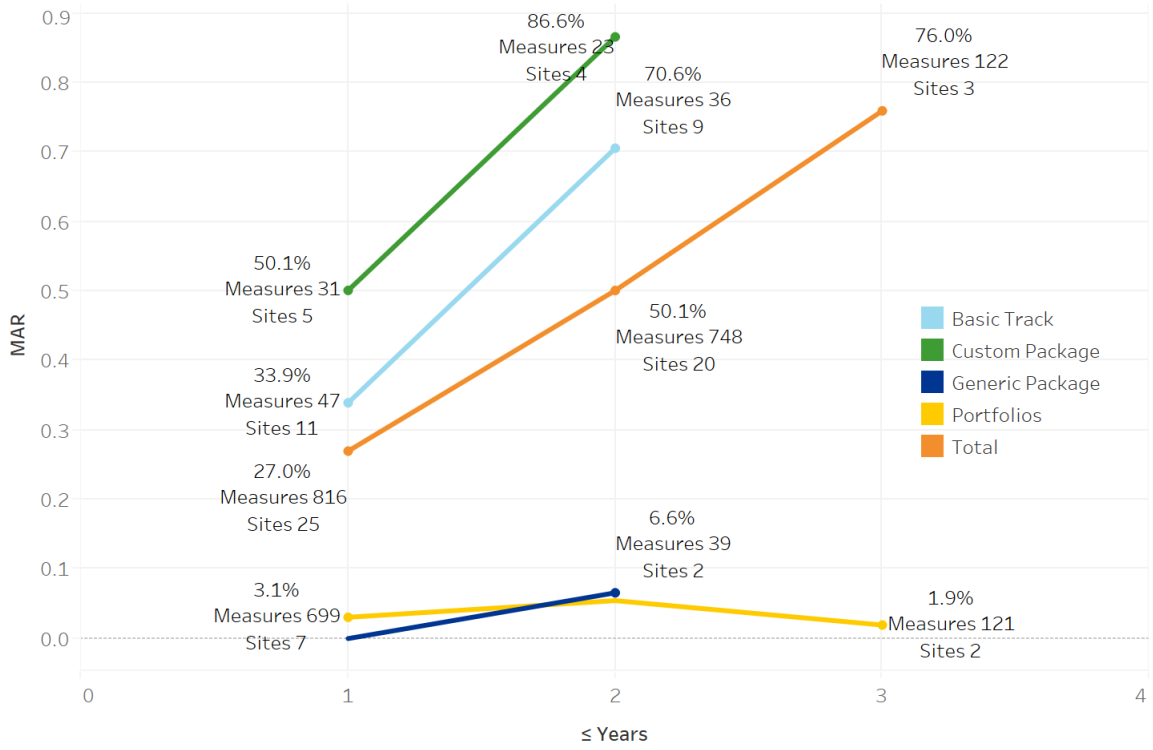


Table 8 provides the details from the analysis of cumulative MAR by program track shown in Figure 2 above. The overall counts are equal to year one counts, since all installations have been completed one year or less since the purchase order date.

Table 8: Cumulative MAR Statistics by Program Track

Program Track	Value	<=Year		Overall
		1	2	
Basic	Number of Customers	11	9	11
	Number of Measures	47	36	47
	MAR Ratio	33.9%	70.6%	37.4%
	Relative Precision*	102.3%	47.6%	92.1%
	Plus Minus**	34.7%	33.6%	34.5%
Custom	Number of Customers	5	4	5
	Number of Measures	32	24	32
	MAR Ratio	53.5%	92.7%	91.40%
	Relative Precision*	47.1%	8.4%	7.90%
	Plus Minus**	25.2%	7.8%	7.20%
Generic	Number of Customers	2	2	2
	Number of Measures	39	39	39
	MAR Ratio	0.0%	6.6%	6.60%
	Relative Precision*	0.0%	121.4%	119.80%
	Plus Minus**	0.0%	8.0%	7.90%
Portfolios	Number of Customers	7	5	7
	Number of Measures	699	650	699
	MAR Ratio	3.1%	5.5%	4.40%
	Relative Precision*	18.5%	13.2%	18.50%
	Plus Minus**	0.6%	0.7%	0.80%
Total	Number of Customers	25	20	25
	Number of Measures	817	749	817
	MAR Ratio	27.7%	51.8%	44.90%
	Relative Precision*	39.2%	12.0%	18.30%
	Plus Minus**	10.9%	6.2%	8.20%

*Relative Precision: Calculated as the absolute precision divided by the ratio itself. By convention, relative precisions are the statistic that are targeted in sampling (i.e., 90/10 is a relative precision metric).
**Plus Minus: Absolute precision, or the percentage points above and below the MAR that define its confidence interval. If the evaluation were repeated several times, selecting samples from the same population, 90% of the time the ratio would be within this range.

In Table 9 we provide a summary of results by three payment categories, showing the MAR for customers that received 100% reimbursement of the energy analysis fee from those that received partial reimbursement. "Phase II" distinguishes customers who have submitted a request for full project payment after measure installations were completed. Basic sites automatically receive a $5000 energy analysis that is fully paid. The table shows a MAR ratio of 50% for Phase II sites within one year of the purchase order, and over 86% in year two. Basic sites are somewhat lower at about 34% for year one and 71% for year two. The rates for all other sites are very low, remaining below 10% in year two.

Table 9: Cumulative MAR Statistics by Payment Category

Program Track	Value	<=Year	
		1	2
Phase II	Number of Customers	6	5
	Number of Measures	64	56
	MAR Ratio	50.0%	86.4%
	Relative Precision*	46.9%	10.9%
	Plus Minus**	23.4%	9.4%
Basic	Number of Customers	11	9
	Number of Measures	47	36
	MAR Ratio	33.9%	70.6%
	Relative Precision*	102.3%	47.6%
	Plus Minus**	34.7%	33.6%
All Else	Number of Customers	8	6
	Number of Measures	706	657
	MAR Ratio	3.0%	6.0%
	Relative Precision*	18.3%	16.4%
	Plus Minus**	0.6%	1.0%
Total	Number of Customers	25	20
	Number of Measures	817	749
	MAR Ratio	27.7%	51.8%
	Relative Precision*	39.2%	12.0%
	Plus Minus**	10.9%	6.2%

*Relative Precision: Calculated as the absolute precision divided by the ratio itself. By convention, relative precisions are the statistic that are targeted in sampling (i.e., 90/10 is a relative precision metric).
**Plus Minus: Absolute precision, or the percentage points above and below the MAR that define its confidence interval. If the evaluation were repeated several times, selecting samples from the same population, 90% of the time the ratio would be within this range.

Figure 3 shows the measure adoption curves by contact group. In the two-year period since most measures were recommended, tenants have adopted 79.5% of recommended savings, while landlords of basic and generic single sites have adopted only 35.5% of recommended savings, and landlords of multiple program sites have adopted fewer than 6%. As reflected in the barriers to measure adoption (Section 3.1.3.3), this result could be the effect of longer adoption timelines for projects conducted by landlords with multiple tenants, as they wait for tenant spaces to change hands, for lease renewals or other enabling conditions.

Figure 3: Self-Reported Combined Energy (kWh) Measure Adoption Curves by Contact Group

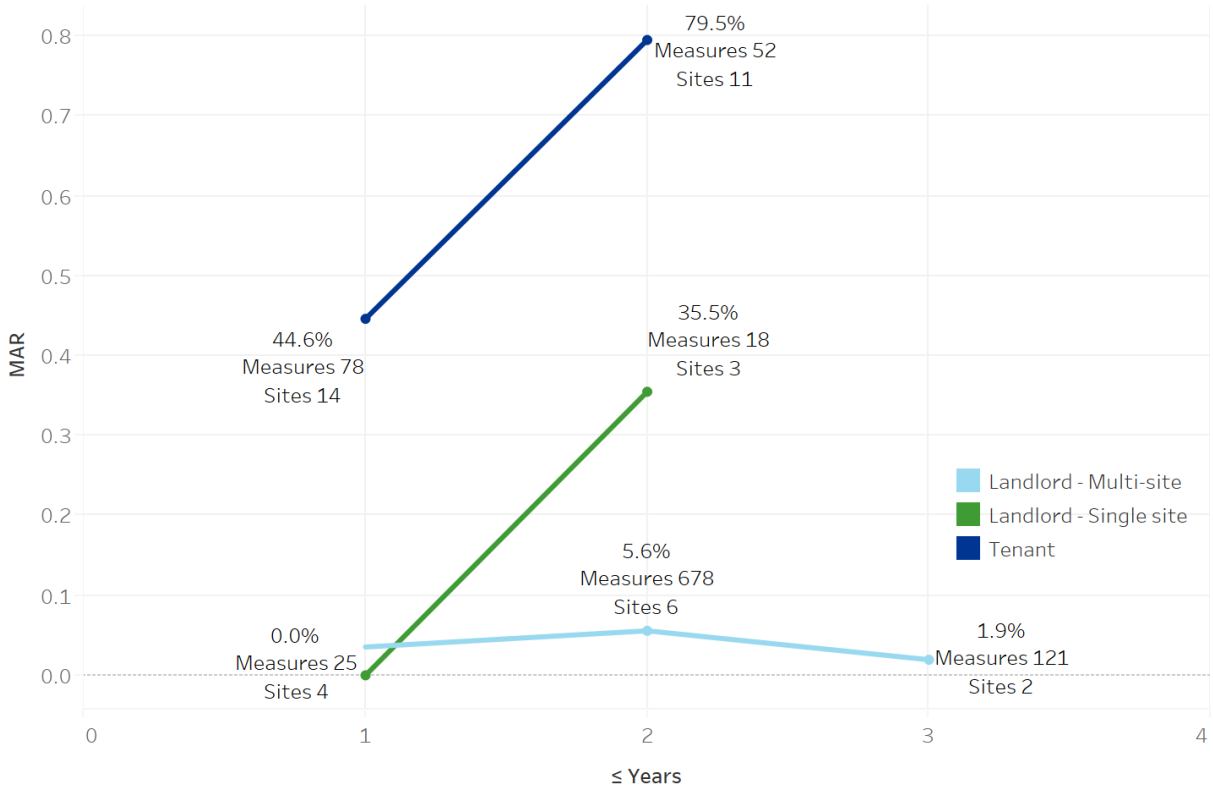


Table 10 shows the CRE Tenant program's participant self-reported energy savings as of December 11, 2019. Overall program projected energy savings values, self-reported installation rates, and installed savings are shown for all savings types. The electric installation rate includes negative tracked savings for measures that were recommended as a best practice, but ultimately increased energy use. The table includes projected savings and installation rates for recommended and implemented measures only, excluding "further study" measures which rarely have associated savings in the tracking data. Only one further study measure was installed as of the interim report date, incurring no associated savings. As non-electric installation rates are found to be zero as of this interim report, the MAR is based on electric savings measure installations only.

Table 10: Participant self-reported energy savings[7]

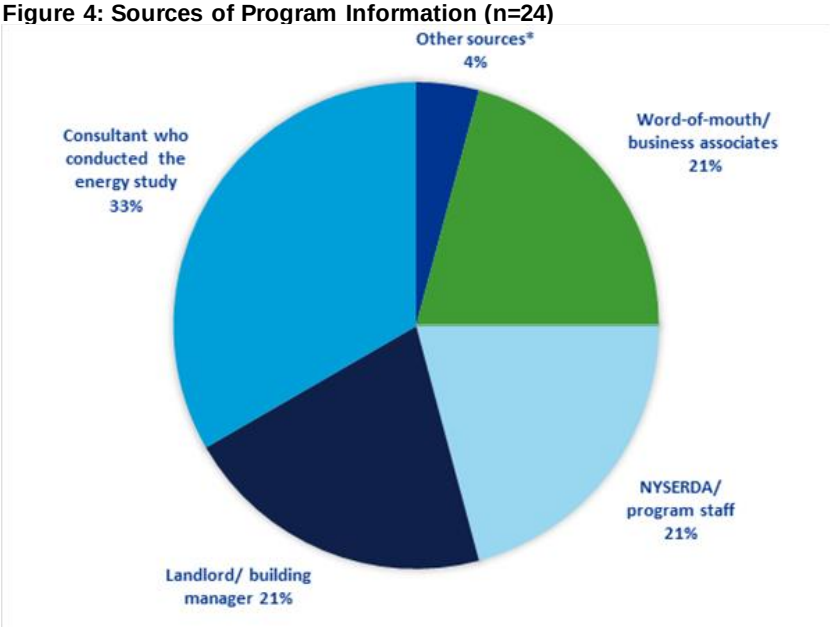
Savings Type	Units	Projected Savings	Installation Rate	Installed Savings
Distillate Oil	MMBTU	-2,164	0.0%	0
Gasoline	MMBTU	-14	0.0%	0
Natural Gas	MMBTU	79	0.0%	0
Steam	MMBTU	7,216	0.0%	0
Water	gallons	5,873	0.0%	0
Electric	kWh	21,638,254	44.9%	9,715,329

[7] Participant self-reported energy savings (Installed Savings) are calculated as Projected Savings (per energy reports and the program tracking data) multiplied by the Installation rate self-reported by program participants.

3.1.3.2 Sources of Program Awareness

The evaluation team was interested in learning how participants heard about the program. The survey asked the participants: "How did you find out about NYSERDA's Commercial Tenant Program?" Figure 4 shows the most-cited source was the consultant who conducted the energy study. However, the participants mentioned their landlord or building manager, NYSERDA staff, or word-of-mouth with almost equal frequency. At this point in the program, energy study consultants are only one third of the information source, which is an indication that information about the program is reaching customers through a variety of ways and not just through consultant promotion.

Figure 4: Sources of Program Information (n=24)



*One respondent mentioned "institutional knowledge" as a source of awareness.

3.1.3.3 Barriers to Energy Efficiency Measure Installation

The evaluation team was also interested in learning why many of the CRE program participants had not installed or implemented the energy-efficient measures which the energy consultants had recommended. The survey asked the participants: "What are some reasons why you haven't installed some/all of the energy efficiency recommendations?" Seventeen of the participants responded to this question. Their responses revealed some interesting differences between the

participants who had installed none of the recommended measures and those who had installed some of the recommended measures (Table 11).

Table 11: Barriers to Energy Efficiency Measure Installation

Barrier to Implementation	Non-Installers (n=9)	Partial Installers (n=8)
They are too expensive	0%	75%
We don't have the available budget to pay for them	33%	38%
We've been too busy with other company activities	33%	38%
We can't convince company/building management/tenant to do the projects	33%	38%
We plan to do them eventually, but other projects had a higher priority	22%	38%
The payback is too long/ ROI too low	11%	25%
Program needs to be more turn-key, streamlined	22%	0%
Not enough energy savings to justify project	11%	0%
We don't know where to find a contractor	11%	0%
Other barriers	56%	14%

Note: The total percentages exceed 100% because multiple responses were allowed.

One interesting result was that while 75 percent of the participants who had installed at least some of the recommended measures cited cost as a barrier, none of the "non-installers" mentioned this as a barrier. One possible explanation is that the "partial installers" were working through their list of recommended measures and installing first the ones which were most affordable, with the remaining measures being the costliest. Evidence for this includes the fact that the partial installers also mentioned as barriers: "we plan to do them eventually, but other projects had a higher priority" and "the payback is too long/ ROI too low."

The non-installers were also much more likely to cite other barriers besides the standard list of barriers that were pre-coded into the survey instrument. The other barriers which the non-installers mentioned included the need for the CRE program to allow the incorporation of Con Edison tenant incentives into the audit's cost calculations; they were planning to move into a new building; they were waiting for some tenants to move out at the end of 2019; tenant "buy-in" was needed; they were uncertain about "next steps"; and that their "point person" was not qualified to take on such as project.

The one other barrier which a partial installer submitted was the ambiguous: "standard practice." Since this came through a web survey, the evaluation team was not able to clarify its meaning. However, a plausible explanation is that it refers to the difficulty of their company in deviating from its traditional practices.

A few of the non-installers also mentioned barriers that the partial installers had not mentioned. These included the need for the program to become more streamlined and turnkey, the belief that

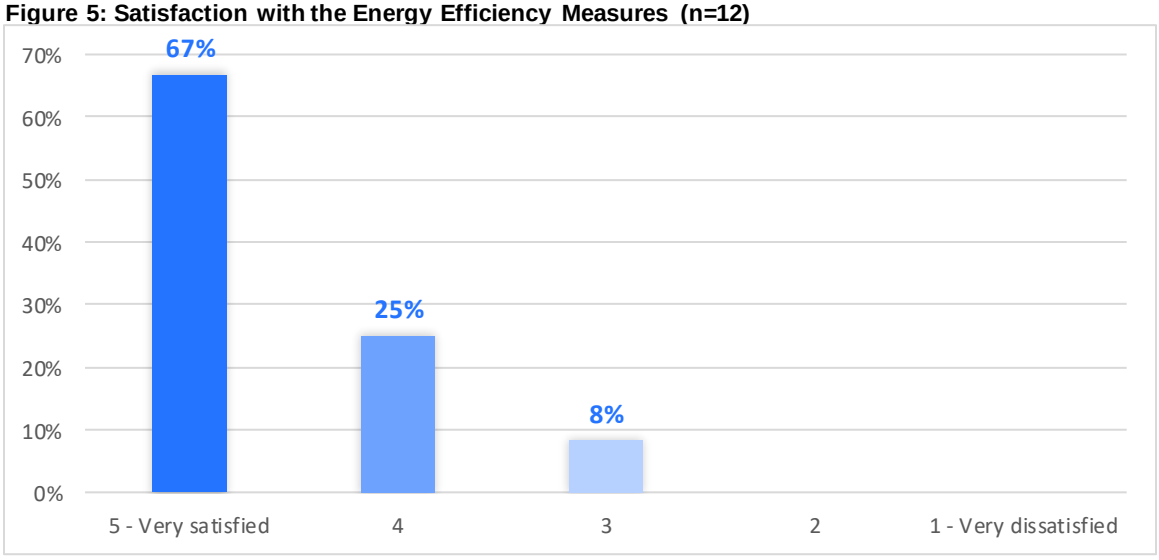
there would not be enough energy savings to justify the project, and difficulty finding a contractor to do the work.

Despite these differences, both the non-installers cited several barriers with similar frequency. These included lacking the budget to pay for the energy efficiency measures, being too busy with other company activities, and having difficulty convincing the company or building managers or tenants to move the projects forward.

3.1.3.4 Satisfaction with the Energy Efficiency Measure Installations

The program participants were generally very satisfied with the installed energy efficiency measures. The survey asked 12 participants who had reported installing at least some of the recommended energy efficiency measures how satisfied they were these improvements. The survey gave them a five-point satisfaction scale where 5 indicated "very satisfied" and 1 indicated "very dissatisfied." The average satisfaction score was 4.6. Figure 5 shows that two thirds of the respondents were "very satisfied" with the installed measures.

Figure 5: Satisfaction with the Energy Efficiency Measures (n=12)



3.2 Recommendations

DNV GL's key recommendations from this impact evaluation are provided in the table below.

Table 12: Recommendations

#	Finding	Recommendation
1	Measure descriptions were usually provided in a notes field that had a mix of quality descriptions. Descriptions understandable to the customer are a key need for evaluation of this program and ideally would be stored in a dedicated field. The measure module has twelve different measure types as well as a notes field that often provides more detailed measure descriptions as well as other pertinent information, but is not always filled in.	• Consider a dedicated field for tracking a lay person description of the measure in addition to the notes field. This will improve future evaluability and internal reporting capabilities. • For programs using Salesforce CRM and the measure module (including NYSERDA programs beyond CRE Tenant), we recommend adding an additional field with standardized detailed measure names. This would allow the program to track recommended measures more easily and will allow future evaluations to report on adoption rates by measure type.
2	Square footage data in the program tracking database was not sufficiently populated to complete the "square footage of participating tenant spaces" objective, and the available data showed evidence of inaccuracy.	The evaluation team recommended that the program collect and/or confirm square footage data through customer surveys to meet this objective. Program staff indicated that this change has been in effect since early 2019. We recommend that program staff review the available data prior to the requirement.
3	Portfolio and generic packages show low measure uptake two years after recommendations (6.6%). Some portfolio customers with no current installations indicated plans to install measures.	• Repeat survey with non-installing customers and customers with planned installation timelines (Phase 2 data collection). • Seek to understand through Phase 2 of the current study whether installation is included in longer term planning of capital budgets, or if they choose not to install, the reasons for their decision. • Review potential to push uptake by following up with multisite generic (within the two-year requirement for installations) and portfolio customers over time.
4	Non-installers cited a need for the CRE program to allow the incorporation of tenant incentives from other programs. As of April 2019, consultants were asked not to include incentive information from other programs in their reports, due to difficulty for NYSERDA to review accuracy of stated incentives and availability, for verification of payback calculations.	Consider a modification of the current policy disallowing inclusion of other program incentives to be mentioned in audit reports. Rather than explicit inclusion of rebates or inclusion in payback calculations, a website link with current rebate amounts could be provided.

#	Finding	Recommendation
5	Non-installers cited uncertainty about next steps and lacking the technical capability to manage implementation of projects.	Address non-installer needs through qualified contractor lists and/or action plans for next steps that enable capturing available technical assistance funds. The Round 2 survey and future evaluations can help address what would be helpful to move towards installation by adding clarifying questions. For example, it would be helpful to understand what tenants have control over, and the effect of CTP install requirements (2 years for reimbursement).
6	None of the recommended non-electric measures were installed.	The Round 2 survey and future evaluations could ask questions that will help verify the disparities in adoption between electric and non-electric measures.

4 Methods

This section summarizes the methods employed to collect and analyze data for sampled measures.

4.1 Data Collection Approach

4.1.1 Sample Strategy

The primary objective of the CRE Tenant MAR survey are to estimate MAR by year, with a 10% confidence interval at the 90% probability level. DNV GL attempted a census sample of all projects (the sampling unit) in order to ensure adequate response necessary to achieve an overall program confidence/precision goal of 90/10.

A portion of contacts was associated with a single project at a single site. A census sample of these "simple sites" was initiated by web survey.

The data collection approach limited time burden on individual contacts by surveying a single contact about up to twenty (20) measure types, consistent with the prior FlexTech MAR study. The respondent then had the option to provide information about up to 20 additional measures recommended for further study.

For "complex sites", or contacts with more than twenty measure types across multiple projects or sites, the team conducted in-depth interviews with customers. In general, the team found that measures would repeat across customer sites for multi-site landlords, and the in-depth interviewer was able to facilitate an efficient completion of the survey for measures across sites.

4.1.2 Survey approach

The evaluation team worked with NYSERDA to send email requests to complete online surveys, in August 2019, and a follow-up email to increase responses. The evaluation team followed these emails with phone calls, resulting in customers completing the online survey with the interviewer on the phone asking and recording the information.

4.2 Measure Adoption Rate Analysis Approach

The analysis calculated two key values from the production data for each evaluated site: cumulative and incremental measure adoption by year. The MAR was calculated as the ratio of installed savings to recommended savings for each measure.

$$MAR = \frac{\sum_j^V kWh\_inst_j w_j}{\sum_j^V kWh\_rec_{j*} w_j}$$

Where:

kWh_inst_j = installed kWh for measure *j* in or prior to year

kWh_rec_j = kWh for recommended measure *j*

w_j = Weighting factor for measure *j*

V = Evaluation sample

Installed kWh per measure is based on participant self-reports of measure installation and estimated energy savings in program tracking data (originates from energy reports).

4.2.1.1 Expansion

Weights were developed at a participant level to adjust for non-response, for expansion of results to the population.

Each weight is simply the number of units in the selected sample (N) divided by the number of completed units in the sample (n).

The weight w_x for each of the project, site and measure weight was calculated as

$$w_x = N_x / n_x$$

Where:

N_x = Number of selected sample units for customer X

n_x = Number of completed sample units for customer X

Appendix A CRE Tenant MAR Data Collection Survey

Q1 Survey Introduction

According to our records, on ${e://Field/date} your company received an energy efficiency study (report) performed by ${e://Field/consultant} for the following address: ${e://Field/address1}

This brief survey asks about your company's use of the study recommendations. In filling out this survey, please use the "Next" and "Back" at the bottom of the page to navigate through the form until your survey is complete. If you have questions before you get started or problems while completing this survey, contact us at: support.cre@dnvgl.com.

Q2 Are you familiar with ${e://Field/consultant} energy efficiency study located at: ${e://Field/address1}

- ○ Yes (1)
- ○ No (2)
- ○ Refused (3)

Skip To: Q6 If Q2 = Yes

Q3 Do you know anyone else in your building/office space who might be familiar with this energy study?

- ○ Yes (1)
- ○ No (2)

Skip To: Q5 If Q3 = No

Q4 Please provide the name, email address and telephone number (if you have them) of the person you think would be familiar with this energy study. Please include the person's name, email and telephone number. They will only be contacted to discuss this survey.

_____

Q5 Thanks for the information. If you are interested in learning more about the NYSERDA Commercial Tenant program, please click here.

Skip To: End of Survey If Q5() Is Displayed

Q6 According to our information, the energy consultant recommended the following energy efficiency improvements for your building or office space. Please check the recommendations you recall the consultant recommending:

meas1 Is Not Empty

- [ ] ${e://Field/meas1} (1-20)

Skip To: Q7 If Q6 = ${e://Field/meas1}

Display This Question:

If Property Manager = 1

Q7 Did you share the energy consultant's report or recommendations with any of your tenants?

- ○ Yes (1)
- ○ No (2)
- ○ Don't know (3)

Display This Question:

If Q7 = No

Or Q7 = Don't know

Q8 Why didn't you share the energy consultant's study with any of your tenants?

- [ ] We've been too busy with other company activities (1)
- [ ] We didn't think they would be interested (2)
- [ ] We didn't think they would understand it (3)
- [ ] Other reason, specify: (4)
- [ ] Don't know (5)

Q9 Have any of the recommended energy efficiency improvements been installed in your building or office space?

- ○ Yes (1)
- ○ No (2)
- ○ Don't know (3)

Skip To: Q17 If Q9 = No

Skip To: Q10 If Q9 = Yes

Skip To: Q17 If Q9 = Don't know

Q10 The following is the list of energy efficiency actions that the energy consultant recommended for your building or office space. Please specify for each recommendation whether it was installed or not:

	Installed (some or all) (1)	Not installed (2)	Don't know (3)
meas1-20 Is Not Empty ${e://Field/meas1} (1-20)	○	○	○

Display This Question:

If Q10 = Installed (some or all)

Carry Forward Selected Choices from "Q10"

X→

Q11 For each recommendation you installed, please provide the approximate date the measure was installed. Please use the following format, e.g., 09/01/2019

Mesa 1-20 Is Not Empty

- ○ ${e://Field/meas1} (1-20)

Display This Question:

If Q10 [Installed (some or all)] (Count) >= 1

Q12 You just indicated that your company/building has completed energy efficient actions recommended by ${e://Field/consultant}. For all these recommended actions, did you

complete everything the consultant recommended, or did you complete only part of what they recommended?

- ○ We completed everything the energy consultant had recommended for all energy efficient actions (1)
- ○ For some of the energy efficient actions we only completed part of what the energy consultant had recommended (2)
- ○ Other, specify: (3) _____
- ○ Don't know (4)

Display This Question:

If Q12 = For some of the energy efficient actions, we only completed part of what the energy consultant had recommended

Q13 You mentioned you only completed part of the recommendations, what part did you not complete?

- ○ Specify: (1) _____
- ○ Don't know (2)

Display This Question:

If Q10 [Installed (some or all)] (Count) = 1

Q14 What were your company's reasons for taking these recommended energy efficiency actions?

- ☐ We received a rebate/incentive for the projects (1)
- ☐ The energy consultant showed us the projects were cost-effective, had a good payback/ROI (2)
- ☐ The NYSERDA program/staff showed us the projects were cost-effective, had a good payback/ROI (3)
- ☐ The projects aligned with our corporate sustainability policies (4)
- ☐ There were other benefits to the projects besides energy savings such as better lighting or improved indoor air quality (5)

☐ Other, specify: (6) _____

☐ ⊗ Don't know (7)

Display This Question:

If Q10 [Not installed] (Count) >= 1

Or Q10 [Don't know] (Count) >= 1

Q15 What are some reasons why you haven't installed all the energy efficiency recommendations?

☐ They are too expensive (1)

☐ We don't have the available budget to pay for them (2)

☐ We've been too busy with other company activities (3)

☐ We don't know where to find a qualified contractor (4)

☐ The payback period(s) on the project(s) is/are too long/the ROI(s) is/are too low (5)

☐ We don't think the energy savings from the project will be enough to make it worthwhile (6)

☐ We can't convince company/building management to do the projects (7)

☐ We plan to do them eventually, but other projects had a higher priority (8)

☐ We don't remember some of the energy-efficient actions that the consultant recommended (9)

☐ Other, specify: (10) _____

☐ ⊗ Your information is incorrect; we have taken some of these energy efficiency actions (11)

☐ ⊗ Don't know (12)

Display This Question:

If Q15 = We plan to do them eventually, but other projects had a higher priority

Q16 In approximately how many years do you plan to complete the remaining energy efficiency recommendations?

- ○ Specify: (1) _____
- ○ Don't know (2)

Display This Question:

If Q10 [Installed (some or all)] (Count) = 0

Or If

Q9 = No

Or Q9 = Don't know

Q17 What are some reasons why you haven't installed any of the energy efficiency actions that the energy consultant recommended?

- ☐ They are too expensive (1)
- ☐ We don’t have the available budget to pay for them (2)
- ☐ We’ve been too busy with other company activities (3)
- ☐ We don’t know where to find a qualified contractor (4)
- ☐ The payback period(s) on the project(s) is/are too long/the ROI(s) is/are too low (5)
- ☐ We don’t think the energy savings from the project will be enough to make it worthwhile (6)
- ☐ We can’t convince company/building management to do the projects (7)
- ☐ We plan to do them eventually, but other projects had a higher priority (8)
- ☐ We don’t remember some of the energy-efficient actions that the consultant recommended (9)
- ☐ Other, specify: (10)

_____

☐ ⊗ Your information is incorrect; we have taken some of these energy efficiency actions (11)

☐ ⊗ Don't know (12)

Display This Question:

If Q17 = We plan to do them eventually, but other projects had a higher priority

Or Q15 = We plan to do them eventually, but other projects had a higher priority

Q18 In approximately how many years do you plan to complete the energy efficiency recommendations?

○ Specify: (4) _____

○ Don't know (5)

Display This Question:

If Q18 = Specify:

Q19 Have you hired or obtained bids from an installing contractor with the intention of installing some or all the recommendations?

○ Yes (1)

○ No (2)

○ Don't know (3)

Display This Question:

If Q19 = Yes

Q20 Which of the following recommended energy efficiency actions have you hired a contractor to complete?

meas1 Is Not Empty

○ ${e://Field/meas1} (1-20)

Q21 Program Participant Satisfaction

Q22 How did you find out about NYSERDA's Commercial Tenant Program?

- ☐ From the energy consultant who conducted the energy study (1)
- ☐ From my landlord/building manager (2)
- ☐ From NYSERDA/program staff (3)
- ☐ From word-of-mouth/business associate (4)
- ☐ Other, specify: (5) _____
- ☐ Don't know (6)

Display This Question:

If Q9 = Yes

Q23 You indicated earlier that your company completed energy efficiency recommendations. How satisfied were you with these improvements? Please use a five-point scale where 5 indicates "very satisfied" and 1 indicates "very dissatisfied".

- ○ Very satisfied (5) (1)
- ○ 4 (2)
- ○ 3 (3)
- ○ 2 (4)
- ○ Very dissatisfied (1) (5)
- ○ Don't know (6)

Display This Question:

If Q23 = 3

Or Q23 = 2

Or Q23 = Very dissatisfied (1)

Or Q23 = Don't know

Q24 Why were you less than satisfied with these energy efficient actions you completed?

- ☐ They did not produce the amount of energy savings I was expecting (1)
- ☐ They were too expensive to complete (2)
- ☐ Completing them significantly disrupted our business operations (3)
- ☐ Other, specify: (4) _____
- ☐ Don't know (5)

Q25 Site Inspections: Later this year, contractors working for NYSERDA's Commercial Tenant Program will visit buildings that installed the recommended energy efficiency measures. If one or more of the recommended measures was installed, you may be contacted to request a brief site visit. Would you be the person to contact to coordinate this visit?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Q25 = No

Q26 Who do you recommend we contact? Please provide an email and/or telephone number.

_____

Q27 Billing Release Form NYSERDA would like to measure the energy savings associated with customers who made energy efficiency improvements through this Commercial Tenant Program. This energy savings analysis will be done with utility billing data. Would you be the person at your company who can provide account information and permission (e.g., sign a

billing release form)? Note, a follow up email will be issued to the appropriate person to complete the billing release form.

- ○ Yes, you can contact me (1)
- ○ No, you need to contact someone else (2)

Display This Question:

If Q27 = No you need to contact someone else

Q28 Who do you recommend we contact? Please provide an email and/or telephone number.

_____

End of Block: Default Question Block

Start of Block: Block 2

Q31 Additional Recommended Measures

Q32 In addition to the energy efficient actions that the consultant recommended, which we have already covered, there are a few other possible energy efficient actions that the energy consultant also mentioned including, specifically: ${e://Field/smeas1} ${e://Field/smeas2}${e://Field/smeas3}${e://Field/smeas4}${e://Field/smeas5}${e://Field/smeas6}${e://Field/smeas7}${e://Field/smeas8}${e://Field/smeas9}${e://Field/smeas10} Would you be willing to answer a three more questions about these other energy efficient actions?

- ○ Yes (1)
- ○ No (2)

Skip To: Q33 If Q32 = Yes

Skip To: End of Survey If Q32 = No

Q33 Did your company/building complete any of these other possible energy efficient actions that the energy consultant also mentioned in the study?

- ○ Yes (1)
- ○ No (2)
- ○ Don't know (3)

Skip To: Q34 If Q33 = Yes

Skip To: End of Survey If Q33 = No

Skip To: End of Survey If Q33 = Don't know

Q34 Which of these other possible energy efficient actions did your company/building complete?

smeas1-20 Is Not Empty

- ☐ ${e://Field/smeas1} (1-20)

Q30 Has your company/building manager taken any additional actions to improve the efficiency of your building or office space, unrelated to this report, since the energy study was conducted in ${e://Field/date}?

- ○ Yes (1)
- ○ No (2)
- ○ Don't know (3)

Display This Question:

If Q30 = Yes

Q35 What additional energy actions did your company/building manager take?

_____

End of Block: Block 2

Appendix B Advance Letter (email)

NYSERDA Commercial Tenant Program
[Date]
Dear [Contact First Name] [Contact Last Name],

According to our records, your company received a [Report Date] energy efficiency study (or report) sponsored by the New York Energy Resource Development Authority (NYSERDA) Commercial Tenant Program. This program helps commercial tenants and owners identify energy efficiency opportunities.

NYSERDA is currently evaluating the effectiveness of this program and requests participants like you to complete a brief online survey to identify whether any of the recommended energy saving improvements have been implemented. This survey relates to a study conducted by: [Contractor Name] for a property located at: [Address]

To get started click on this link [link] or copy and paste the URL into your internet browser.

An independent engineering firm, DNV GL, is conducting this survey on behalf of NYSERDA. The information collected in this survey will be used to determine the impact of and improve the program. We appreciate your willingness to complete this brief survey.

Should you have questions about the survey, please respond to support.cre@dnvgl.com

Thank you for your participation,

Dana Nilsson
NYSERDA
17 Columbia Circle | Albany, NY 12203-6399
nyserda.ny.gov
follow: friend: connect with NYSERDA