Continuous Energy Improvement Market Evaluation: Appendices

YEAR 2

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Appendix A. CEI Market Progress Indicators

Table 1 shows the most recent assessed values for the market progress indicators for NYSERDA's Continuous Energy Improvement (CEI) Initiative. The Market Evaluation Team did not update any MPIs in Year 2 to avoid survey fatigue and because of the timing of pilot activities. The team expects to update all indicators in Year 3.

Table 1. CEI Market Progress Indicator Status

Market	Indicator	Baseline Estimate (2017)	Target (2019)a
1. OsEM	1. OsEMs offering services in New York	6 firms, 7 professionals	N/A
	2. Participant industrial sites retaining OsEMs (after pilot engagement ends)	N/A	20
	3. Nonparticipant industrial sites hiring an OsEM	15% (1,021 facilities)	16.5%
2. SEM	4. Facilities that have adopted a system for monitoring, tracking, and making decisions based on their energy use	27% (1,886 facilities)	1,913 facilities
	5. Participant industrial facilities that have adopted SEM (after the pilot engagement ends)	N/A	27
	6. Nonparticipant industrial facilities that have adopted SEM	0% (17 facilities)	11
3. EMIS	7. Number of EMIS deployed in NY as a result of this initiative	0	50
	8. Number of EMIS assessments/audits as a result of this initiative	0	60
	9. Number of facility-wide EMIS deployments as a result of this initiative	0	45
	10. Number of enterprise-wide EMIS deployments as a result of this initiative	0	4

[a]CEF Industrial Chapter, Revised November 2017

Appendix B. Indirect Benefits Methodology Detail

This appendix provides additional detail on the specific methods the Market Evaluation Team will use to estimate indirect benefits.

As presented in the body of this report, the Team will use the following algorithm to estimate indirect benefits from each of the three CEI Initiative components—OsEM, SEM, and EMIS:

$$\boldsymbol{Indirect\ benefits_t} = [(\boldsymbol{Nonparticipant\ Adoption} - \boldsymbol{NOMAD}) + \boldsymbol{Direct\ Influence\ Participant\ Adoption}]_t * \boldsymbol{UEB}$$

Where the equation's variables have the following definitions:

- **Nonparticipant Adoption:** Units of adoption by nonparticipating targeted end users who have adopted the technology or practice
- **Naturally-Occurring Market Adoption (NOMAD):** Estimated industrial facilities that would have adopted the technology or practice absent NYSERDA's intervention, by facility type
- **Direct Influence participant adoption:** Additional units of adoption by participant companies after they are no longer receiving incentives or direct support from NYSERDA
- **Unit Energy Benefit (UEB):** Energy savings (MWh or MMBtu) or CO_2e reductions per industrial facility resulting from adoption of OsEM, SEM and/or EMIS, by facility type

Note that this equation must be applied to each of the three CEI components—OsEM, SEM, and EMIS—as NYSERDA estimates indirect benefits for each of the three programs separately. The Team will report on indirect impacts beginning in 2019—year three of the market evaluation.

Research Methods

The Market Evaluation Team designed market research activities and research instruments to estimate each of the first three variables in the indirect benefits estimation algorithm. These research activities and the estimation approach for each variable are summarized in Table 2.

Table 2. Indirect Benefits Algorithm Variables and Research Activities

Algorithm Variables	Research Activity/Source	Estimation Method
(1) Nonparticipant Adoption	Industrial Facility Manager Survey (biannual)	The estimated proportion of industrial facilities adopting OsEM/SEM/EMIS multiplied by the total number of facilities.
(2) Naturally-Occurring Market Adoption (NOMAD)	• Industrial facilities survey • Delphi panel/CMAT	The Market Evaluation Team will average the NOMAD estimate from the Delphi panel and the estimate derived from the industrial survey to determine the NOMAD value it will use to calculate indirect benefits.
(3) Direct Influence Participant Adoption	Participant Survey (annual)	Additional units of adoption by participant companies after they are no longer receiving incentives or direct support from NYSERDA OsEM/SEM/EMIS
(4) Unit Energy Benefit (UEB)	CEF Industrial Chapter assumed/updated values	Unit energy savings and CO_2e reduction values will be applied for OsEM, SEM, and EMIS, by facility type.[a]
[a] Per the program documentation, the Market Evaluation Team assumes NYSERDA will evaluate distinct UEBs for OsEM, medium and large facilities. UEBs also could be estimated for targeted, high-intensity industries versus others.		

The Team will use the Unit Energy Benefits values NYSERDA used to estimate benefits in the CEI Budget and Benefits workbook or updated values, as appropriate. The Team will use the specific methods described below to estimate nonparticipant adoption, NOMAD, and direct influence participant adoption.

Nonparticipant Adoption

Data Sources

The Market Evaluation Team will rely on two key data sources to estimate nonparticipant adoption:

1. InfoGroup Database: A database of all manufacturing facilities in New York, and
2. Industrial Facility Manager Survey: a bi-annual survey of industrial facility managers.

To inform the market evaluation, NYSERDA purchased a database from Infogroup containing contact information for 6,923 manufacturing facilities located in New York. NYSERDA considers this database to be a census of all manufacturing facilities (identified as having a North American Industry Classification System code beginning with 31, 32 or 33).

In 2017, the Market Evaluation Team developed an Industrial Facility Manager Survey, which will be repeated every two years to estimate market adoption of CEI components. The survey's first wave was completed in 2017. The Market Evaluation Team refined the survey in 2018 to support an estimate of EMIS adoption that better aligns with the EMIS initiative component and to incorporate questions to collect inform analysis of indirect impacts.

The Market Evaluation Team will use the survey data to estimate total market adoption of OsEM, SEM, and EMIS and to identify evidence of NYSERDA's market influence.

The survey includes batteries of questions to determine whether each CEI Initiative component has been adopted; OsEM and EMIS adoption will be determined by the questions summarized in Table 3.[1]

Table 3. Facility Manager Survey Questions to Determine OsEM and EMIS Adoption

Technology/Practice	Questions
OsEM	• Does your facility have an individual or team with formal responsibility for energy performance? • Is this a team or an individual? • [If team] Does the team have an individual with primary responsibility for team objectives? • Does this person (employee or contractor) work on site, where primary production occurs?

EMIS	• Is your facility currently using a software tool to track energy use over time?
	• Which of the following does this tool or system perform?
	  ○ Take periodic readings of energy usage at production line, facility, or multiple-facility levels and store data
	  ○ Provide automated analysis and reporting of energy usage
	  ○ Provide visual displays of energy use over time, such as charts or graphs
	  ○ Integrate energy use with production data
	  ○ Compare current energy usage to an energy usage baseline

To determine SEM adoption, the Team created a series of questions tied to each CEE minimum element for SEM adoption. The Year 1 Market Evaluation report discusses those questions at length as well as the method of determining SEM adoption, as does this document (see Appendix C).

Nonparticipant Adoption Estimation Approach

The Team will rely on the InfoGroup database and the Industrial Facility Manager Survey to estimate nonparticipant adoption. The database will provide the total number of industrial facilities in New York, while the survey data will indicate the proportion of the nonparticipant population that has implemented OsEM, SEM, and EMIS. The Team will multiply that proportion by the total number of facilities in New York state to determine "units" of adoption for each measure, as described by the equations that follow.

[1] The OsEM and EMIS batteries have been revised for the 2019 survey, based on learning and recommendations from the Year 1 market evaluation.

OsEM

$$Nonparticipant\ Market\ Adoption_t = (\%\ large\ NY\ nonparticipating\ facilities\ \ that\ have\ adopted\ OsEM_t * total\ NY\ nonparticipating\ facilities) + (\%\ medium\ NY\ nonparticipating\ facilities\ \ that\ have\ adopted\ OsEM_t * total\ NY\ nonparticipating\ facilities)$$

SEM

$$Nonparticipant\ Market\ Adoption_t = (\%\ NY\ nonparticipating\ facilities\ \ that\ have\ adopted\ SEM_t * total\ NY\ nonparticipating\ facilities)$$

EMIS

$$Nonparticipant\ Market\ Adoption_t = (\%\ NY\ nonparticipating\ facilities\ \ that\ have\ adopted\ EMIS_t * total\ NY\ nonparticipating\ facilities)$$

Naturally-Occurring Market Adoption

End-User Survey of Nonparticipant Industrial Facilities

As described above, the Market Evaluation Team will conduct the industrial facilities survey every two years to estimate market adoption of CEI components. The Team will also use this survey to estimate program-induced adoption versus NOMAD of OsEM, SEM, and EMIS. The survey will ask each respondent that indicates adoption of one or more CEI measure a series of questions designed to detect and estimate program influence.

One of the key evaluation challenges presented by market transformation programs is their indirect influence on the end users that ultimately adopt the energy-saving technologies or practices. Because market transformation programs seek to increase market adoption by effecting structural market changes, the Team expects that survey respondents may be unable to make direct connections between their implementation of CEI measures and NYSERDA's program activities. Therefore, the questions designed to detect program influence will focus on timing and identification of ***market*** influences that can be attributed to NYSERDA's program activities, as summarized in Table 4.

Table 4. Facility Manager Survey Questions to Detect and Assess Initiative Influence

Issue	Survey Questions
Did timing precede the market intervention?	• When did your facility first consider assigning formal responsibility for energy performance? • When did your facility first adopt energy performance goals? • When did your firm first communicate a company-wide commitment to achieving energy efficiency goals through ongoing and systematic energy management? • When did your facility first consider adopting a tool or system to track energy usage? • Approximately when was this [EMIS readiness] assessment conducted?

Possible influence by NYSERDA-targeted market actors/partners?	• Which, if any, of the following factors contributed to your interest in assigning formal responsibility for energy performance to a specific individual?
	  ◦ Information from an Industry Association (specify)
	  ◦ Information/pitch from a consultant or provider of these services (specify)
	  ◦ Information from utility, NYSERDA, or other entity (specify)
	  ◦ Training, workshop, webinar, or other event (specify)
	  ◦ Read a case study or report (specify)
	  ◦ Another source (specify)
	• Which of the following factors contributed to your company's decision to make a company-wide commitment to achieving energy efficiency goals through ongoing and systematic energy management? [Same choice set]
	• Which of the following factors contributed to your facility's decision to adopt an energy tracking tool or system? [Same choice set]

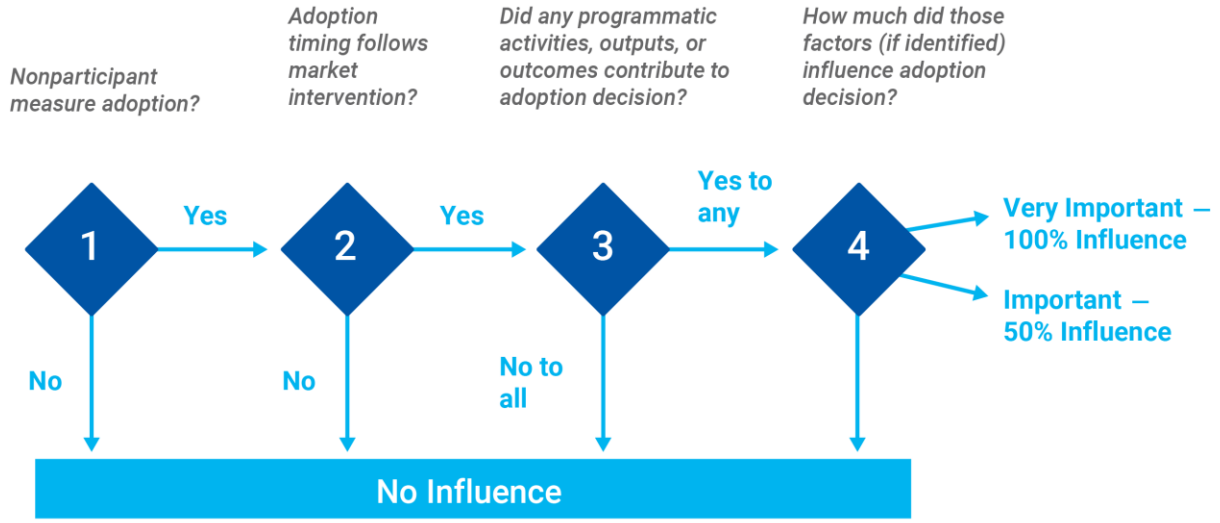
How influential were factors?	• Using a 1-4 scale where 1 means "not at all important" and 4 means "very important", how important was [repeat for each factor] to your company's decision to assign formal responsibility for energy performance to a specific individual? • How important was [repeat for each factor selected] to your decision to make a company-wide commitment to ongoing and systematic energy management? [Same scale] • How important was [repeat for each factor from D8g] to your decision to adopt an energy tracking tool or system? [Same scale]

Program Influence Assessment Approach

As noted in Table 4, the industrial facilities survey asks survey respondents who adopted one or more CEI measures following the launch of NYSERDA's CEI Initiative and who identify one or more contributing

factors that correspond with a CEI Initiative activity or output to rate the importance of each factor in their decision to implement each measure. The Market Evaluation Team will use the survey responses to assign a level of program influence to nonparticipant market adoption—no influence (zero percent), some influence (50 percent), or fully program-induced (100%), as summarized in Figure 1.

Figure 1. Program Influence Assessment Approach



Delphi Panel/CMAT

In 2017, the CEI market evaluation established baseline forecasts for market adoption of SEM and OsEM, using a Delphi panel in combination with the Cadmus Market Assessment Tool. In 2018, the Market Evaluation Team used the same method to develop a market adoption forecast for EMIS. The specific methods used for these research activities are described in this report (for EMIS) and in the Year 1 Market Evaluation report (for SEM and OsEM).

NOMAD Estimation Approach

For each CEI measure, Cadmus will average the NOMAD estimate resulting from the Delphi panel and the NOMAD estimate resulting from the industrial survey program influence analysis and use these average values in the indirect benefits estimation algorithm, as described by the equations that follow.

OsEM

$$NOMAD_t = [(Delphi\ market\ adoption\ forecast_t + \%\ NY\ nonparticipating\ facilities\ adopting\ OsEM\ without\ program\ influence_t)/2] * total\ NY\ nonparticipating\ facilities$$

SEM

$$NOMAD_t = [(Delphi\ market\ adoption\ forecast_t + \%\ NY\ nonparticipating\ facilities\ adopting\ SEM\ without\ program\ influence_t)/2] * total\ NY\ nonparticipating\ facilities$$

EMIS

$$NOMAD_t = [(Delphi\ market\ adoption\ forecast_t + \%\ NY\ nonparticipating\ facilities\ adopting\ EMIS\ without\ program\ influence_t)/2] * total\ NY\ nonparticipating\ facilities$$

Direct Influence Participant Adoption

Participant Surveys

The Market Evaluation Team will rely on longitudinal surveys with a census of end-user participants to estimate adoption by program participants companies who were directly engaged with NYSERDA and subsequently implemented one or more CEI measures. The participant surveys will include questions that ask respondents to quantify the number of facilities at which their company implemented OsEM, SEM, and EMIS without direct assistance from NYSERDA. The team will consider all such adoptions to be influenced by the program. The Team will develop these survey instruments in Year 3 of the market evaluation.

Direct Influence Estimation Approach

The Market Evaluation Team will use results from the annual participant surveys to estimate the units of direct influence participant market adoption and will use this value in the indirect benefits estimation algorithm for each CEI measure, as follows.

OSEM

$$Participant\ Adoption\ (direct\ influence)_t = \#\ facilities\ of\ participant\ companies\ that\ adopted\ OsEM\ after\ pilot\ engagement\ ended_t$$

SEM

$$Participant\ Adoption\ (direct\ influence)_t$$
$$= \#\ facilities\ of\ participant\ companies\ that\ adopted\ SEM\ after\ pilot\ engagement\ ended_t$$

EMIS

$$Participant\ Adoption\ (direct\ influence)_t$$
$$= \#\ facilities\ of\ participant\ companies\ that\ adopted\ EMIS\ after\ pilot\ engagement\ ended_t$$

Appendix C. Updates to Industrial Facility Manager Survey

The Industrial Facility Manager Survey collects information needed to meet NYSERDA's market evaluation objectives, including continued measurement of market progress indicators and general research questions identified in the market evaluation workplan. The original version of the survey consisted of two phases: a computer-assisted telephone interviewing (CATI) phase; and a second online phase. The CATI instrument was designed to capture key information needed to assess market progress indicators, while the online instrument collected more detailed, qualitative information on current facility practices. Dividing the question into two instruments allowed different individuals at the same facility to respond, as appropriate. Originally fielded in 2017, the CATI instrument received 324 complete responses, with an average response time of about 10 minutes. The online instrument received 46 responses, a number of which were incomplete.

In 2018, the Market Evaluation Team made updates to the CATI survey instrument and the scoring rubric used to analyze responses. Where necessary, the team modified existing survey questions to improve question clarity. All edits were designed to preserve the ability to compare responses to questions across survey waves. The team also incorporated several new questions to capture updated information on the EMIS system and indirect program impacts. In addition, the team retired the online instrument due to low response rates, and moved some online questions to the CATI instrument. The team limited new questions to those that could be added while maintaining a 15-minute or less average response times for the survey.

Summary of Updates

This section summarizes updates to the survey instrument and related scoring that impact measurement of the market progress indicators. The revised survey instrument and scoring rubric follow this section.

Indicator 3: Nonparticipant industrial sites hiring an OsEM.

- Added C6c to determine if team has a designated leader that might operate as OsEM. Updated scoring to allow for this.
- Changed skip patterns for C7a to ask about employee OR contractor. Previously, excluded contractors. This does not impact scoring because 0 facilities indicated the individual was a contractor.

- Added questions (C7b, C8x – C8z) based on recommendation from the Year 1 CEI Market Evaluation: *The Team should also add questions to the end-user survey to determine: whether energy performance is considered in the OsEM's performance review (accountability); the hours per week that OsEMs dedicate to energy management (importance); the OsEM's education or background (skill level); and whether the OsEM is supported by an outside consultant (technical support to compensate for a lower skill level).*

  These questions were not included in MPI scoring to preserve comparisons to 2017 results, but they will provide additional context for interpreting 2019 results.

Indicator 4: Facilities that have adopted a system for monitoring, tracking, and making decisions based on their energy use.

- Removed [D6≠3] condition from D7, will no longer use D6_3 as part of scoring.
- Added D8d through D8j to collect additional info on EMIS function and usage; these will also collect data for non-EMIS systems.

Indicator 6: Nonparticipant industrial facilities that have adopted SEM.

- 1a. Attitude:
  - C1: Eliminated options that referred to demand reduction, distributed energy generation, and renewables. Added option referring to CEI. (Note – options were not scored in Year 1, so change does not affect scoring).
- 1b. Policy and Goals:
  - C3: Removed "plan" from question about policy
  - Added C4a to ask specifically about a plan
  - Added C5a through C5c to establish indirect impact of SEM pilot
- 1c. Resources:
  - Added C6c to ask about team leader (so that team not excluded from OsEM scoring)
  - Updated C7 logic to include either dedicated EM or team lead
  - Added C7b to ask about outside consultant support (note: included skip for E1)
  - Added C8t – C8v to support indirect impacts analysis

- Added C8w – C8z based on Yr 1 recommendation to capture additional info about energy manager
- C9 – changed language for clarity
- C10 – changed language for clarity

- 2a. Energy Management Assessment:
  - Added D1a for flow (not scored)
  - D2: Updated language for clarity
- 2c. Metrics and Goals:
  - D4a and D4b: Split existing question to ask about different fuels separately
  - Adjusted scoring to incorporate D11 and D13 (KPIs) (these questions removed from scoring for 2f)
- 2d. Project Register:
  - D6: No longer conditional on whether company has goals (C4);
  - D6a: split out tracking part of question into new question; options read aloud.
  - Updated Market Evaluation definition of 2d (see updated scoring worksheet).
- 2e. Employee Engagement:
  - D15: changed to reference last 2 years (2017 and 2018) instead of last 3 years
- 2f. Implementation - See 2c changes
- 2g. Reassess:
  - D16: Changed scoring so that "Less frequently than annually" counts for partial adoption
- 3a. Measurement:
  - Removed energy management software condition [D6≠3] from D7, will no longer use D6_3 as part of scoring. Also updated language for D7.
- 3b. Data Collection and Analysis:
  - D17: Removed skip logic limiting question to C4=1 (has goals); no change to scoring, will use C4 to filter responses

- 3c. Analysis:
    - D18: Moved up in question order; removed skip logic limited to D1=1 (has reviewed energy usage for savings opportunities); no change to scoring, will use D1 to filter responses
- 3d. Reporting:
    - No change

Indicator 7: Number of EMIS deployed in New York due to this initiative.

- D6 (method to track projects) no longer conditional on C4 (goals). Scoring will filter for presence of goals.
- Added D8c to identify whether system meets NYSERDA criteria to qualify as an EMIS.
- Added D8d, D8f, D8g, D8h to collect additional info on EMIS indirect impacts
- Added D8e, D8h – D8j to collect additional information on function and usage; will not be scored.

End-User CATI Survey, 2018 Update (DRAFT)

Interviewer instructions are in green.
CATI programming instructions are in red.
Answer options in parenthesis are not read

Screener for Inbound Calls

Hi, this is a survey line for an energy use study in New York industrial facilities. We are conducting a study with company energy decision makers with industrial or manufacturing facilities in New York state.

IBS1. First, I just need to confirm that your company has a manufacturing or production facility in New York state. Is this correct?

[If yes], please confirm the following:

- Company Name
- Primary business category (industrial, manufacturing, …)
- What is your name and title? [Contact Name, Title]

[If no or don't know], ask for company name, industrial type, to match a company on the sample list. Collect:

- Primary business category (industrial, manufacturing, …)
- What is your name and title? [Contact Name, Title]

Before we get started, I'd like you to know that we will keep your responses anonymous. They will be aggregated with other people's responses in our report. Your responses will not be linked to you or your company, so please feel free to speak as candidly as you like. [Skip to 0]

Screener for Outbound Calls

[Variables from sample]
[CONTACT NAME]
[TITLE]
[COMPANY]
[ADDRESS]

A. Introduction

*May I speak with [CONTACT NAME]? [IF THAT PERSON IS NOT AT THIS PHONE NUMBER, ASK FOR NAME AND PHONE NUMBER AND START AGAIN]

(Yes)
(Don't know) [ASK TO SPEAK WITH SOMEONE WHO IS INVOLVED IN ENERGY DECISIONS AT THIS COMPANY AND BEGIN AGAIN]
(Refused) [THANK AND TERMINATE]

*Hello, I'm [INSERT NAME] calling from Cadmus on behalf of NYSERDA, the New York State Energy Research and Development Authority. We are conducting an important study about energy use with executives of industrial companies in New York state. NYSERDA is assessing current energy management practices and needs for industrial companies and will use that information to design resources to support companies like yours. These initiatives are very important to the state's

economic future. Are you involved with decisions about your company's energy use and management practices?

(Yes)
(No, person is able to come to phone) [ASK FOR PERSON WHO IS A DECISION MAKER AND START AGAIN]
1. (No, person is not able to come to phone) [GET NAME, PHONE NUMBER, AND SCHEDULE CALLBACK]
(Don't know) [ASK FOR PERSON WHO WOULD KNOW AND START AGAIN]
(Refused) [THANK AND TERMINATE]

Is this a good time for you to answer a few questions about energy practices for your company?

(Yes) [Continue]
(No [ASK: When would it be a good time for me to call back?] [SCHEDULE CALLBACK])
(Don't know) [ASK TO SPEAK WITH SOMEONE ELSE AND START AGAIN]
(Refused)

Back-up information, not to be programmed:

[If "No – Not a convenient time," ask if Respondent would like to arrange a more convenient time for us to call them back or if you can leave a message for that person.]

[IF RESPONDENT ASKS HOW LONG, SAY: "APPROXIMATELY 15 MINUTES."]
[IF NEEDED:] This survey is for research purposes only and this is not a marketing call. This is the primary way for NYSERDA to gather information about industrial company energy use and practices. Your participation in this study is important so that NYSERDA can include your perspectives in how energy efficiency initiatives are offered in New York.

[**Only if asked** for a NYSERDA contact to verify the survey authenticity, offer
Carley Murray, Project Manager
NYSERDA
carley.murray@nyserda.ny.gov

READ: Great. We appreciate your time and willingness to respond to this survey. Before we get started, I'd like you to know that we will keep your responses anonymous. They will be kept confidential and aggregated with other people's responses in our report. Your responses will not be linked to you or your company, so please feel free to speak as candidly as you like.

B. Screeners

*What is your title? [READ LIST ONLY IF NECESSARY]

(Owner)
(President)
(Chief Executive Officer [CEO])
(Chief Operating Officer [COO])
(Chief Financial Officer [CFO])
(Facility or Property Manager)
(Finance Manager)
(Building operator)
(Building engineer)

(Other [SPECIFY:_____])[If an office manager or similar administrator type, ask whether they are involved in company management decisions. If not, ask for someone else who is involved in management decisions.]
(Don't know) [ASK FOR SOMEONE ELSE INVOLVED IN MANAGEMENT DECISIONS. IF NO ONE THEN THANK AND TERMINATE.]
(Refused) [ASK FOR SOMEONE ELSE INVOLVED IN MANAGEMENT DECISIONS. IF NO ONE THEN THANK AND TERMINATE.]

How many production facilities [buildings] does your company operate within New York state? [If needed: Production facilities are buildings where your company produces, manufactures, or processes goods. We are particularly interested in facilities with medium to high energy use.]
[Record number: ____][If none or 0, THANK AND TERMINATE]
[If B2>1] Our records indicate you are located at the facility at: [ADDRESS]. If that is not correct, what is the address of the facility where you are located?
[_____]

Our records indicate your company has approximately [NO. of EMPLOYEES] employees in the facility where you are stationed. Does this sound about right?
1. (Yes)
2. (No) [What is the correct number of employees? _____]
98. (Don't know)
(Refused)

What category best represents your facility's annual spend on energy (electric and natural gas)?
Less than $500,000
Between $500,000 and $1,000,000
More than $1,000,000
(Don't know)

C. Energy Management Commitment

Thank you for confirming those details. I'd like to start by understanding the role energy management has in your facility operations and priorities. Recognizing that companies may have multiple facility types, I'd like you to think about how these questions apply to your particular facility, where possible. If some of the terms are unfamiliar or used in many different ways, let me know and I will provide further clarification. We are most interested in what these terms and concepts mean for your facility.

Using a 1-5 scale where 1=not at all important and 5=extremely important, How important to your facility are the following for maintaining a competitive advantage: [1a.At]
Energy efficient equipment [Record 1-5 rating, DK, Unfamiliar]
Process Efficiency practices [Record 1-5 rating, DK, Unfamiliar]
Executive-level commitment to ongoing and systematic energy management [Record 1-5 rating, DK, Unfamiliar]
(Don't know)
(Refused)

Has your company's top management expressed verbal support for energy management? [1a.At]
(Yes)

(No)
98. (Don't know)
99. (Refused)
98.

Does your company or facility have a written energy policy that includes guiding principles for energy management? [IF NEEDED: This may be part of a broader sustainability plan with other goals such as recycling, waste reduction, water use, etc.] [1b.PG]

(Yes)
(No)
98. (Don't know)
99. (Refused)
99.

Does your facility set energy performance goals? [1b.PG]

(Yes)
(No)
98. (Don't know)
99. (Refused)
100.

C4a. [IF 0=1] Do you have a documented plan for how to achieve those goals?

1. (Yes)
(No)
98. (Don't know)
99. (Refused)

101.

[If 0=1] Have your energy performance goals been communicated to operations staff? [1b.PG]

(Yes)
(No)
98. (Don't know)
99. (Refused)
102.

C5a. [IF 0=1, C4a=1, AND 0=1] In what year did your company first adopt a commitment to ongoing and systematic energy management?

1. [Year]
98. Don't know
98. Refused
103.

104. C5b. [IF IF 0=1, C4a=1, AND 0=1] Which of the following factors contributed to your company's decision to make a company-wide commitment to ongoing and systematic energy management?

1. Information from an Industry Association (specify association)_____
Information/pitch from a consultant or provider of these services (specify consultant)_____
Information from utility, NYSERDA, or other entity (specify entity)_____
Training, workshop, webinar, or other event (specify event)_____
Read a case study or report (specify) _____
Another source (specify)_____
Don't know / None of the above

Refused

C5c. [ASK IF C5b ≠ 98,99] How important was [repeat for each factor from C5b] to your company's decision to make a company-wide commitment to ongoing and systematic energy management? Would you say it was…[READ OPTIONS]

1. Very important
2. Somewhat important
3. Not too important
4. Not at all important
98. Don't know
99. Refused

Does your facility have an individual or team with formal responsibility for energy performance? [1c. Res]

(Yes) [0a. Is this a team or an individual? (team=1, individual=2)]
(No) [0b. Does your company have plans to identify an energy manager? (yes=1, no=2, don't know)]
98. (Don't know)
99. (Refused)

C6c. [If 0a=1] Does the team have a designated leader with primary responsibility for the team's objectives?

5. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

[If 0a=2 or C6c=1] Is this individual a company employee or an outside consultant or contractor? [1c. Res]

Employee
Consultant or Contractor [Specify firm]
98. (Don't Know)
99. (Refused)

C7b. [IF 0 = 1] Is this individual supported by an outside consultant or contractor with engineering or energy management expertise?

1. (Yes) [Specify firm]
2. (No)
98. (Don't know)
99. (Refused)

C7a. [If 0a=2 or C6c=1] Does this person work on-site, where primary production occurs?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

105. C8t. [ASK IF 0=1 OR C6b = 1] In approximately what year did your facility first consider assigning formal responsibility for energy performance?

1. [Year]
98. Don't know
98. Refused

106.

107. C8u. [ASK IF C6a=2 OR C6c=1] Which, if any, of the following factors contributed to your company's decision to assign formal responsibility for energy performance to a specific individual? [READ LIST. MULTIPLE RESPONSES ALLOWED.]

1. Information from an Industry Association (specify association)_____
Information/pitch from a consultant or provider of these services (specify consultant)_____
Information from utility, NYSERDA, or other entity (specify entity)_____
Training, workshop, webinar, or other event (specify event)_____
Read a case study or report (specify) _____
Another source (specify)_____
Don't know / None of the above
Refused

C8v. [ASK IF C8u ≠ 98,99] How important was [repeat for each factor from C8u] to your company's decision to assign formal responsibility for energy performance to a specific individual? Would you say it was…[READ OPTIONS]

1. Very important
2. Somewhat important
3. Not too important
4. Not at all important
98. Don't know
99. Refused

C8w. [If 0a=2 or C6c=1] Does this individual have a specific set of targets related to energy performance that are part of their job description or performance review?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

C8x. [If 0a=2 or C6c=1] What percentage of this person's time is dedicated to energy performance-related tasks?

1. 25% of their time or less
2. From 26% to 50% of their time
3. From 51% to 75% of their time
4. More than 75% of their time
98. (Don't know)
99. (Refused)

C8y. [If 0a=2 or C6c=1] Does the individual have any type of energy management certification?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

C8z. [If C8yz=1] What type of certification do they have?

1. CEM (Certified Energy Manager, through AEE)
2. CP EnMS (Certified Practitioner in Energy Management Systems, through 50001)
3. LEED Professional
4. Other [Specify:_____]

98. (Don't know)
99. (Refused)

108.

[If 0a=team] Earlier you mentioned your facility has a team responsible for energy performance. How frequently does the team meet? [1c. Res]

(Daily)
(Weekly)
(Monthly)
(Quarterly)
(Twice a year)
(Annually)
(Varies or "as needed")
(Other), Specify_____
(Does not meet)
(Don't know)
(Refused)

[IF 0=1] Which best describes your facility's level of dedicated **staff resources** to [If C4=1 "achieve energy management goals?" OR IF C4 >1 "manage energy performance?"] [Read response options] [1c. Res]

Sufficient level of staff resources
Some, but not sufficient, staff resources
No staff resources dedicated

98. (Don't know)
99. (Refused)

[IF 0=1] Which best describes your facility's level of **funding** [If C4=1] "dedicated to achieve energy management goals?" [OR If C4 =2,98,99] "for energy projects or initiatives?" [Read response options] [1c. Res]

Sufficient level of funding
Some, but not sufficient, funding
No funding

98. (Don't know)
99. (Refused)

D. Planning and Implementation

Has your facility ever conducted a review of energy-using equipment and energy bills to identify savings opportunities? [2a.EMA]

(Yes)
(In process)
(planning to)
(No)
98. (Don't know)
(Refused)

D18. **[MOVED]** Have you established an energy consumption baseline for your facility, to determine changes in energy use? [If needed: This is an analysis of your facility's energy data and relevant drivers of energy consumption such as facility production output, used for measuring potential impacts from energy consumption changes.] [3c.An]

1. (Yes)
2. (In process)
3. (planning to)
4. (No)
98. (Don't know)
99. (Refused)

READ: Now I'd like to talk about ways your facility may be engaged in and implementing **strategic energy management. Strategic Energy Management is a company-wide commitment to ongoing and systematic energy management**. You may have heard this referred to as "S.E.M" or continuous energy improvement or "C.E.I.". Because there are several aspects to SEM, your answers to the following questions will help us classify how your facility manages energy compared to other facilities in New York.

D1a. First, how familiar are you with the concept of SEM or continuous energy improvement?

1. Very familiar
2. Somewhat familiar
3. Not too familiar
4. Not at all familiar?
99. Refused

Has your facility undergone an organizational assessment for *strategic* energy management activities? This is an assessment of your facility's energy management practices; it focuses on energy management structure and practices, as opposed to specific energy savings opportunities. [2a.EMA]

(Yes)
(In process)
(planning to)
(No)
99. (Don't know)
(Refused)

Has someone at your facility developed an energy map to identify the key energy drivers and end uses?
[READ IF NEEDED: This is a breakdown of processes from raw materials to final distribution, and all the energy end uses, such as lighting or hot water, required to produce the end product.]
[2b.EMAP]

(Yes)
(In process)
(planning to)
(No)
98. (Don't know)
(Refused)

[If 0=1] You mentioned earlier that your facility has energy performance goals. For which of the following fuels has your facility set goals? [ALLOW MULTIPLE RESPONSE]

Electricity
Natural gas
Other fuel [specify]
Don't know
Refused

D4a. [IF 0=1] How are the goals for electricity defined; and what are they? (READ IF NEEDED: An energy performance goal is often expressed as a percent or an absolute reduction of energy use per production unit over time, for example, 5% reduction in electricity use per production unit within 3 years.) [2c.MG]

1. Defined as: percent reduction of energy use per production unit over time; D4a. [Specify percent and period]

Defined as: absolute reduction of energy use per production unit over time ; D4b. [Specify quantity, unit (MMBTUs or megawatt hours) and period]
Defined in some other way [Specify]
98. (Don't know)
(Refused)

D4b. [IF 0=2] How are the goals for natural gas defined; and what are they? (READ IF NEEDED: An energy performance goal is often expressed as a percent or an absolute reduction of energy use per production unit over time, for example, 5% reduction in electricity use per production unit within 3 years.) [2c.MG]

1. Defined as: percent reduction of energy use per production unit over time; D4a. [Specify percent and period]

Defined as: absolute reduction of energy use per production unit over time ; D4b. [Specify quantity, unit (MMBTUs or ccf) and period]
Defined in some other way [Specify]
99. (Don't know)
(Refused)

[If 0=1] When did your facility first adopt energy performance goals?
[RECORD YEAR]
(Don't know)
(Refused)

[IF C4a = 1] In which of the following ways does your facility document potential energy management projects? [2d.PR] [Read options aloud; Allow multiple responses]

Project or opportunity register
Tune up action item list
Energy management tracking software
Updating energy management plan
Does not document potential energy efficiency projects
95. Other [Specify]
98. (Don't know)
(Refused)

D6a. [IF 0 = 1] Does your facility update this list or register to track energy management project progress and completion? [2d.PR]

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

Is your facility currently using a tool or system to track energy use over time? [READ IF NEEDED: This is typically a detailed spreadsheet or software-driven system that records energy consumption across end-uses over time. Some also calculate and report energy savings.] [3a.MS]

(Yes)
(In process)
(planning to)
(No)
98. (Don't know)
99. (Refused)

[ASK IF D7=1,2] What type of tool or system are you using (or do you plan to use)? [Can select more than one option if mentioned] [MTR]

(Monitoring, Targeting and Reporting model (MT&R))
(Energy Management Information System (EMIS))
(Microsoft Excel-based spreadsheet tool)
Other tool or system [Specify]
98. (Don't know)
(Refused)

D8c. [ASK IF D7=1,2] Which of the following does this tool or system perform? [Read options; Select all that apply] [EMIS]

1. Takes periodic readings of energy usage at an equipment level, and stores data
Takes periodic readings of energy usage at a production line level, and stores data
Takes periodic readings of energy usage at a facility level, and stores data
Takes periodic readings of energy usage across multiple facilities, and stores data
Provides automated analysis and reporting of energy usage
Provides visual displays of energy use over time, such as charts or graphs
Integrates energy use with production data
Compares current energy usage to an energy usage baseline

Monitors progress toward an energy usage target
None of the above
98. (Don't know)
(Refused)

D8d. [ASK IF D7=1,2] In what year did your facility first consider adopting a tool or system to track energy usage?

1. [Year]
98. Don't know
98. Refused

D8e. [ASK IF D7=1,2] Did your facility undergo a readiness assessment or audit prior to installing your energy tracking system? [If necessary: An energy tracking system readiness audit typically consists of a review of existing equipment, current energy usage, energy saving opportunities, and existing monitoring and reporting systems to identify an appropriate energy tracking software package.]

1. Yes
2. No
98. Don't know
98. Refused

D8f. [ASK IF D7=1,2] Approximately when was this assessment conducted?

1. [Year]
98. Don't know
98. Refused

D8g. [ASK IF D7=1,2] Which of the following factors contributed to your company's decision to adopt an energy tracking tool or system?

1. Information from an Industry Association (specify association)_____
Information/pitch from a consultant or provider of these services (specify consultant)_____
Information from utility, NYSERDA, or other entity (specify entity)_____
Training, workshop, webinar, or other event (specify event)_____
Read a case study or report (specify) _____
Another source (specify)_____
98. Don't know / None of the above
99. Refused

D8h. [ASK IF D8g ≠ 98,99] How important was [repeat for each factor from D8g] to your company's decision to assign formal responsibility for energy performance to a specific individual? Would you say it was…[READ OPTIONS]

1. Very important
2. Somewhat important
3. Not too important
4. Not at all important
98. Don't know
99. Refused

D17. [MOVED] How frequently does staff review energy performance data? [3b.DCA]

1. (Daily)
2. (Weekly)
3. (Monthly)
4. (Quarterly)
5. (Twice a year)
6. (Annually)
7. (Varies or "as needed")
8. (Other), Specify_____

98. (Don't know)
99. (Refused)

D8i. Which of the following types of decisions, if any, do you or does your company make using analysis of energy performance data? [RANDOMIZE LIST]

1. Decisions about building improvements, such as new lighting or heating and cooling equipment

Decisions about when to upgrade production equipment
Decisions about production times and volume
Decisions about energy management goals or energy management plans
Decisions about staff location
Other decisions [Specify]
Company does not base any decisions on output

98. (Don't know)
99. (Refused)

D8j. Does your company receive analysis and reporting based on your energy usage data from an outside firm through a regular subscription service?

1. (Yes)
2. (No)

98. (Don't know)
99. (Refused)

[FORMERLY BLANK] [IF 0=1 AND 0=1,2] How important is your energy data tracking tool or system to your facility's ability to manage your energy performance goals? Would you say it is…

Very important
Somewhat important
Not too important
Not at all important
Don't know
Refused

Has your facility adopted any initiatives that contribute to energy efficiency **equipment** optimization? This could include services through ISO 50001, a strategic energy management program,

continuous energy improvement, lean, six sigma, kaizen, total quality management or another continuous improvement initiative. [2c.MG]

(Yes) [Specify]
(In process)
(planning to)
(No)
98. (Don't know)
99. (Refused)

[If 0=1] Are these equipment optimization initiatives included in facility key performance indicators or KPIs? [2c.MG]

(Yes)
(No)
98. (Don't know)
99. (Refused)

Now focusing on production processes within your facility, has your facility adopted initiatives that contribute to energy **process** optimization? Again, this may include I-S-O 50001 or another initiative. [2c.MG]

(Yes) [Specify]
(In process)
(planning to)
(No)
109. (Don't know)
110. (Refused)

[If 0=1] Are these energy process optimization initiatives included in facility key performance indicators or KPIs? [2c.MG]

(Yes)
(No)
98. (Don't know)
99. (Refused)

Has your facility completed any energy or process efficiency projects or launched any energy management initiatives within the past 2 years? [2f.Imp]

(Yes)
(In process)
(planning to)
(No)
98. (Don't know)
99. (Refused)

[If 0=1] Has the energy manager or team conducted any specific employee engagement activities around energy management or conservation in the past 2 years? [IF NEEDED: INCLUDES ANY ACTIVITIES THAT INVOLVE STAFF OUTSIDE AN ENERGY TEAM, SUCH AS ENGAGING STAFF TO TURN OFF EQUIPMENT WHEN NOT USED, AWARENESS CAMPAIGNS, ETC.] [2e.EE]

(Yes)
(In process)
(planning to)
(No)

98. (Don't know)
99. (Refused)

D15a. [If D15=1,2] How frequently, if at all, has the energy manager or team conducted employee engagement activities specifically related to energy management? [IF NEEDED: Includes any activities that involve staff outside an energy team, such as engaging staff to turn off equipment when not used, awareness campaigns, etc.]:

1. Weekly
Monthly
Quarterly
Annually
Less frequently than annually
Not at all
Other
Don't know
Refused

[If C4a = 1] How often do you reassess your list of planned projects to ensure that these align with business and energy performance priorities? [2g.Rmt]

(Weekly)
(Monthly)
(Quarterly)
(Annually)
(Less frequently than annually)
(When operations change)
(Have not revisited plan)
(Plan is too recently established to warrant review)
(Other [Specify])
98. (Don't know)
(Refused)

[MOVED]

[MOVED]

How often is your facility's energy use data shared with company stakeholders, such as management or operations staff? [3d.RP]

(Daily)
(Weekly)
(Monthly)
(Quarterly)
(Twice a year)
(Annually)
(Varies or "as needed")
(Other), Specify_____
(Does not meet)
98. (Don't know)

(Refused)

E. Barriers and Interest

My last set of questions are about your facility's interest in strategic management solutions and possible challenges your facility may have experienced when considering energy management.

Are you currently participating in a strategic energy management methodology or system with guidance from an external consultant or organization?

(Yes)
(No)
98. (Don't know)
99. (Refused)

[If 0=1] What is the name of the consulting firm or organization that you are working with? [RECORD RESPONSE]

[IF 0≠1] Have you considered participating in a Strategic Energy Management program at any time within the past two years?

(Yes)
(No)
98. (Don't know)
99. (Refused)

[If E1=1 OR 0=1] What, if any, challenges has your facility faced when considering or implementing a Strategic Energy Management plan or program? [DON'T READ LIST. RECORD ALL THAT APPLY]

(High initial cost)
(Budget limitations)
(Long payback period)
(Enough return on investment)
(Lack of technical knowledge about energy efficiency equipment)
(Lack of staff time to dedicate to pursuing energy efficiency upgrades)
(Funding competition from other company priorities)
(Age/condition of building)
(Management support)
(None, no challenges)
(Other [SPECIFY:_____])
Process disruptions
(Don't know)
(Refused)

Do you have any additional comments or suggestions regarding energy management practices or NYSERDA's efforts to encourage energy reduction in industrial companies? [RECORD ANSWER]

F.

F6. What trends do you see regarding energy management within the industrial industry? [RECORD ANSWER]

On Termination: Thank you for your help. We appreciate your time and opinions

Indicator Scoring Methodology, Updated 2018 (DRAFT)

CEE Minimum Elements	Subelement	CEE Definition	Market Evaluation Definition	Contributing Survey Questions	Scoring		
					Full	Some	None
1. Company Commitment	1a. Efficiency Attitude	N/A	Management has expressed that energy and process efficiency are at least somewhat important to maintain a competitive advantage.	C1, C2	C1a>3 AND C1b>3 AND C1c>3 AND C2=1	Any other combination	C2>1, C1a<4 C1b<4
	1b. Policy and Goals	Set, frame, and communicate long-range energy performance objectives through an energy policy and energy reduction goals	Facility has a written energy plan or policy; has set energy reduction goals; has communicated goals to staff.	C3, C4, C5	C3=1 AND C4=1 AND C5=1		C3>1, C4>1, C5>1
	1c. Resources	Ensure that SEM initiatives are properly resourced for goal attainment, including assigning responsibility or accountability to an individual energy champion, energy team, or support of employee engagement activities	Facility has a team with responsibility for energy performance that meets at least once per quarter; facility has at least minimal staff and funding support needed to manage energy performance.	C6, C8-C10	C6=1 AND c6a="team" AND C8<5 AND C9<3 AND C10<3		C4>1 AND C6>1 AND C6b="No" AND C8>6, AND C9=NR, AND C10=NR
2. Planning & Implementation	2a. Energy Management Assessment	Assess current energy management practices by using a performance scorecard or facilitated energy management assessment	Facility has completed a review of equipment and energy bills to identify savings opportunities, and completed an organizational assessment for SEM.	D1, D2	D1<3 AND D2<3	Any other combination	D1>3; D2>3
	2b. Energy Map	Develop a breakdown or map of energy end uses and costs across the company	Facility has developed an energy map to identify the key energy drivers and end uses	D3	D3<3		D3>3
	2c. Metrics and Goals	Establish clear, measurable goals for energy performance improvements, based on analysis of baseline energy consumption and relevant variables of energy consumption	Facility has defined energy performance goals in terms of energy consumption quantities, or a percentage reduction in use, and has committed to goals as part of facility KPIs.	D4, D4x, D4y, D11, D13	D4<3 AND [EITHER D4x<3 OR D4y<3 OR BOTH] AND D11=1 AND D13=1		D4>2 AND [BOTH D4x>2 and D4y>2] AND D11>1 AND D13>1
	2d. Project Register	Periodically review energy performance by comparing actual consumption to expected consumption, and use this information to reassess goals, metrics, and planned projects	Facility has list of potential projects; revisited the list or energy management project plan at least once.	C4a, D6, D6a	C4a=1 AND D6<5 AND D6a=1		C4a>1 AND D6=5 AND D6a=2

	2e. Employee Engagement	Develop and implement a plan to educate employees about their activities' energy impacts	Facility has conducted any employee engagement activities related to energy or conservation in the last 2 years.	D15, D15a	D15<3 AND D15a<5		D15>2
	2f. Implementation	Complete measures in the project register	Facility has completed at least one process or energy efficiency project in the last 2 years.	D14	D14<3		D14>3
	2g. Reassessment	Periodically review energy performance by comparing actual consumption to expected consumption, and use this information to reassess goals, metrics, and planned projects	Facility has revisited the project register at least once.	D16	D16=1,2,3, OR 6		D16=99,98
3. System for Measuring and Reporting Energy Performance	3a. Measurement	Regularly collect performance data to understand energy use; this subelement should capture all relevant energy consumption variables, including production and weather	Facility uses a tool that tracks energy use over time.	D7	D7<3	Any other combination	D7>3
	3b. Data Collection and Analysis	Collect and store energy performance measurements versus goals in commonly available formats	Facility reviews energy performance at least monthly.	C4, D17	C4 = 1; D17<4		C4>1, D17=>8
	3c. Analysis	Create a baseline of energy consumption and a model to predict energy consumption; regularly update the model	Facility has established an energy consumption baseline.	D1, D18	D1=1, D18<2		D1>1, D18>3
	3d. Reporting	Provide internal and external stakeholders with the results of energy initiatives and achievements compared to goals	Facility shares facility energy use with stakeholders such as management or operations staff.	D19	D19<7		D19>8

Appendix D. Supplemental Detail on the EMA Tool and the Assessment Tool

The program team's Energy Management Assessment (EMA) tool and the market evaluation's assessment tool are both based on the Consortium for Energy Efficiency's (CEE) three minimum elements of strategic energy management (SEM).[2] This section discusses differences in how the two tools interpret this framework.

Structural Differences

The Team's assessment tool and the EMA tool differ in how they define and assess components of each minimum element. The Market Evaluation Team's assessment tool was designed and organized to correlate with the CEE's three SEM minimum elements and 13 subelements, with one exception: the Team included an additional subelement, "Efficiency Attitude", under the CEE framework's "Customer Commitment" minimum element.

The design of the implementation team's EMA tool also is based on the three CEE SEM minimum elements, but uses slightly different names for each minimum element, and incorporates slightly different factors into each. Like the assessment tool, each EMA element consists of several subelements, which the EMA tool refers to as "assessment points". While the EMA assessment points are conceptually similar to the CEE subelements, they do not perfectly align with them. The EMA tool uses only nine assessment points instead of the CEE's 13 subelements. Although the EMA tool assesses fewer subelements, it collects and scores more information overall, using 38 scored questions compared to 26 in the assessment tool. Table 5 shows the structure of the two tools.

[2] Consortium for Energy Efficiency. *Strategic Energy Management Minimum Elements*. February 11, 2014. https://library.cee1.org/content/cee-strategic-energy-management-minimum-elements

Table 5. Comparison of SEM Subelements for the Assessment Tool vs. the EMA Tool

SEM Minimum Element	Subelements: Market Evaluation Tool	Subelements: EMA Tool
Customer Commitment	Efficiency Attitude	
	Policy and Goals	Policy and Goals
	Resources	Resources
		Communication
Planning and Implementation	Energy Management Assessment	
	Energy Map	
	Metrics and Goals	
	Project Register	
	Employee Engagement	Employee Engagement
	Implementation	
	Reassessment	Reassessment
		Project Management
System for Measuring and Reporting Energy Performance	Measurement	
	Data Collection	Data Collection and Availability
	Analysis	Analysis
	Reporting	Reporting

Approaches to Scoring

In addition to differences between subelements and assessment points, the two tools use different scoring methods. The assessment tool is designed to measure the SEM practices defined by each subelement up to the minimum threshold needed for the subelement to be considered fully adopted. The Team uses the assessment tool to determine which facilities show no, partial, or full adoption of each subelement, and to quantify the number of "SEM adoptions" across the population of industrial facilities in New York—that is, facilities that have achieved full adoption of each of the 14 subelements. The assessment tool uses between one and five questions to assess each subelement. The question structure varies depending on the question, and may include just three response options (yes, no, don't know) or scalar response options, as appropriate to the question. The tool defines the specific set of responses to each question necessary to qualify as "full adoption," "partial adoption," or "no adoption."

Using the EMA tool, each assessment point is scored based on two to 10 questions. Each question contains five responses, correlating to a 1 to 5 scale, where 1 equals no adoption and 5 equals the highest level of SEM adoption. The score for the assessment point is the average score from responses to questions within that assessment point.

Table 6 illustrates the difference in the ways the two tools assess adoption of SEM subelements, using the example of policy and goals. For this subelement, the assessment tool asks a series of yes/no questions. If the facility responds "yes" to each question, it has met the subelement criteria for full adoption. If it responds "no" to each subelement, it will be scored as having no adoption, and a mix of "yes" and "no" will earn a score of partial adoption. In contrast, the EMA tool asks two multiple-choice questions, and the score, from 1 to 5, will be the average of the two questions. In the EMA tool, responses 3, 4, and 5 meet the minimum criteria for full adoption established in the assessment tool.

Table 6. Example of Tool Question Differences: Policy and Goals

Assessment Tool	EMA Tool
1. Does your company or facility have a written energy policy that includes guiding principles for energy management? A) Yes B) No C) Don't know 2. Does your facility set energy performance goals? A) Yes B) No C) Don't know 3. *[Asked if 2 = Yes]* Have your energy performance goals been communicated to operations staff?[a] A) Yes B) No C) Don't know	1. An energy policy _____. A) Is not needed. B) Does not exist. C) Exists, but is known by few people. D) Is widely known, but resources are not committed. E) Has resources committed. 2. An energy savings goal _____. A) Is not needed. B) Does not exist. C) Exists, but is loosely defined. D) Exists, is well defined, but is largely unknown or not being met. E) Is Specific, Measurable, Achievable, Relevant, Time-bound (SMART).

[a] The EMA tool addresses communication under a separate subelement.

Detailed Comparison of Program EMA Tool and Market Evaluation SEM Scoring

This section compares how the tools each defines and scores its minimum elements and subelements (referred to as assessment points in the EMA tool).

Customer Commitment

In the assessment tool, the Customer Commitment minimum element consists of three sub-elements:

1) Efficiency Attitude

2) Policy and Goals
3) Resources

The EMA tool assessment points include:

1) Policy and Goals
2) Resources
3) Communication

In the assessment tool, communication is included as a requirement for full adoption of the Policy and Goals sub-element.

Efficiency Attitude

The assessment tool includes three questions about the customer's attitude toward energy efficiency, shown in Assessment Tool Efficiency Attitude Questions. The EMA tool, however, does not have questions that directly correlate to these, but similar concepts are included as parts of other EMA questions.

Table 7. Assessment Tool Efficiency Attitude Questions

Assessment Tool Sub-element	Assessment Tool Questions	Required Response(s) for Full Adoption
Efficiency Attitude	C1a. Using a 1-5 scale where 1 means not at all important and 5 means extremely important, how important to your facility are the following for maintaining a competitive advantage: Energy Efficiency	>2
Efficiency Attitude	C1b. Using a 1-5 scale where 1 means not at all important and 5 means extremely important, how important to your facility are the following for maintaining a competitive advantage: Process Efficiency	>2
Efficiency Attitude	C2. Has your company's top management expressed verbal support for energy management? 1) Yes. 2) No. 96) Refused. 97) Don't know.	1) Yes

Policy and Goals

Table 8 shows questions used for the Market Evaluation Team' assessment tool and the implementation team's EMA tool to assess a company's SEM policy and goals. Questions about energy policy and performance goals are similar. The EMA tool has a greater focus on communication than the assessment tool, but the communication questions are evaluated as their own assessment point and do not contribute to a customer's score for Policy and Goals.

Table 8. Policy and Goals Questions Comparison

Assessment Tool Sub-element	Assessment Tool Questions	Required Response(s) for Full Adoption	EMA Tool Assessment Point	EMA Tool Relevant Questions
Policy and Goals	C3. Does your company or facility have a written energy policy that includes guiding principles for energy management? 1) Yes. 2) No. 96) Refused. 97) Don't know.	1) Yes	Policy and Goals	An energy policy _____. 1) Is not needed. 2) Does not exist. 3) Exists, but is known by few people. 4) Is widely known, but resources are not committed. 5) Has resources committed.
Policy and Goals	C4. Does your facility set energy performance goals? 1) Yes. 2) No. 96) Refused. 97) Don't know.	1) Yes	Policy and Goals	An energy savings goal _____. 1) Is not needed. 2) Does not exist. 3) Exists, but is loosely defined. 4) Exists, is well defined, but is largely unknown or not being met. 5) Is Specific, Measurable, Achievable, Relevant, Time-bound (SMART).
	C4a. Do you have a documented plan for how to achieve those goals? 1) Yes. 2) No. 96) Refused. 97) Don't know.			
Policy and Goals	C5. Have those goals been communicated to operations staff? 1) Yes. 2) No. 96) Refused. 97) Don't know. 99) Not applicable.	1) Yes	Communication	Energy information (e.g. kWh, therms, spend) is _____. 1) Not available to operations staff. 2) Regularly used by executive leadership. 3) Available to the Energy Champion and/or energy team. 4) Available to all employees, in some form. 5) Regularly presented to owners, the board of directors, investors, and/or customers.
			Communication	Energy information is provided to employees _____. 1) Never. 2) Under rare circumstances. 3) For projects, on an as-needed basis. 4) Is generalized for all employees. 5) Is tailored to specific areas of responsibility.
			Communication	Employee communications about energy are provided_____.1) Never. 2) Occasionally. 3) Quarterly. 4) Monthly. 5) Weekly.

Resources

Table 9 shows questions used for the Market Evaluation Team's assessment tool and the implementation team's EMA tool to assess resources available for SEM. The assessment tool focuses on whether the customer has an energy champion and energy team that meets regularly and is supported by management. The EMA tool asks additional details about resources and staff responsibilities. Finally, the EMA tool's question about an energy champion falls under a separate Project Management assessment point (and not part of the assessment tool) and does not contribute to the Resources score.

Table 9. Resources Questions Comparison

Assessment Tool Sub-element	Assessment Tool Questions	Required Response(s) for Full Adoption	EMA Tool Assessment Point	EMA Tool Questions
Resources	C6. Does your facility have an individual or team with formal responsibility for energy performance? 1a) Yes, a team. 1b) Yes, an individual. 2) No. 96) Refused. 97) Don't know.	1a) Yes, a team	Resources	To manage energy, we have_____.1) Not identified staff to manage energy. 2) Identified an Energy Champion. 3) Identified an Executive Sponsor. 4) Established a cross-functional energy team. 5) Spread responsibility to a broad base of employees.
Resources	C8. How frequently does the team meet? 1) Daily. 2) Weekly. 3) Monthly. 4) Quarterly. 5) Twice a year. 6) Annually. 7) Varies. 9) Does not meet. 95) Other. 96) Refused. 97) Don't know. 99) Not applicable.	Quarterly or more frequently	Resources	Accountability for energy management rests on _____.1) No one. 2) An individual. 3) A small number of individuals. 4) A formal, cross-functional team. 5) All employees.
Resources	C9. Which best describes your facility's level of dedicated staff resources to achieve energy management goals? 1) Sufficient level of staff resources 2) Some, but not sufficient, staff resources 3) No staff resources dedicated 96) Refused. 97) Don't know	1) Sufficient level of staff resources 2) Some, but not sufficient, staff resources	Resources	Identifying energy efficiency opportunities is_____. 1) Not currently assigned to anyone. 2) The Executive Sponsor's responsibility. 3) The Energy Champion's responsibility. 4) The energy team's responsibility. 5) Everyone's responsibility.

Assessment Tool Sub-element	Assessment Tool Questions	Required Response(s) for Full Adoption	EMA Tool Assessment Point	EMA Tool Questions
Resources	C10. Which best describes your facility's level of funding dedicated to achieve energy management goals? 1) Sufficient level of funding 2) Some, but not sufficient, funding 3) No funding dedicated 96) Refused. 97) Don't know.	1) Sufficient level of funding 2) Some, but not sufficient, level of funding	Resources	Energy efficiency upgrades are funded _____.1) [Not currently funded.] 2) As part of a general capital improvement budget. 3) Through maintenance budgets. 4) Through maintenance and capital budgets. 5) Through a designated budget line item for energy efficiency.
			Resources	Third-party energy efficiency resources, such as your utility, _____. 1) Are not used. 2) Are rarely used. 3) Are occasionally used. 4) Are frequently used. 5) Are an integral part of our energy management efforts.
			Project Management	Our energy team _____. 1) Does not exist. 2) Consists of an Energy Champion. 3) Holds regular meetings. 4) Regularly implements energy saving opportunities. 5) Actively engages all employees in a structured way.

Planning and Implementation

The EMA tool groups many of the questions relevant to Planning and Implementation into an assessment point called Project Management. The Project Management assessment point contains 10 questions, relevant across all three of the SEM minimum elements (not just Planning and Implementation), making it difficult to map this assessment point directly to the assessment tool. Table 10 shows differences in questions for the Planning and Implementation sub-elements.

Table 10. Planning and Implementation Questions Comparison

Assessment Tool Sub-element	Assessment Tool Questions	Required Response(s) for Full Adoption	EMA Tool Assessment Point	EMA Tool Questions
Energy Management Assessment	D1. Has your facility ever conducted a review of energy-using equipment and energy bills to identify savings opportunities? 1) Yes. 2) In process. 3) Planning to. 4) No. 96) Refused. 97) Don't know. 99) Not applicable.	1) Yes or 2) In process	N/A	N/A (This is the EMA tool)
	D2. Has your facility undergone an organizational assessment for strategic energy management activities? 1) Yes. 2) In process. 3) Planning to. 4) No. 96) Refused. 97) Don't know. 99) Not applicable.	1) Yes or 2) In process		
Energy Map	D3. Has someone at your facility developed an energy map to identify the key energy drivers and end uses? 1) Yes. 2) In process. 3) Planning to. 4) No. 96) Refused. 97) Don't know. 99) Not applicable.	1) Yes or 2) In process	Project Management	Systems-level energy use information _____. 1) Is not readily available. 2) Includes a static pie chart of energy use by system. 3) Includes an inventory of motors with horsepower identified. 4) Is available through control systems. 5) Is available through sub-meter data.
Metrics and Goals	D4a. [IF D4=1] How are the goals for electricity defined? 1) percent reduction of energy use per production unit over time 2) absolute reduction of energy use per production unit over time 95) Other. 96) Refused. 97) Don't know. 99) Not applicable.	1) Percentage reduction or 2) Energy consumption	Project Management	Energy performance metrics _____. 1) Have not been developed. 2) Include dollars. 3) Include units of energy (e.g. kWh, therm). 4) Include energy intensity (e.g. kWh per widget). 5) Include an energy-intensity model.
	D4b. [IF D4=2] How are the goals for natural gas defined? 1) percent reduction of energy use per production unit over time 2) absolute reduction of energy use per production unit over time 95) Other. 96) Refused. 97) Don't know. 99) Not applicable.	1) Percentage reduction or 2) Energy consumption		

Assessment Tool Sub-element	Assessment Tool Questions	Required Response(s) for Full Adoption	EMA Tool Assessment Point	EMA Tool Questions
	D10. Has your facility adopted any initiatives that contribute to energy efficiency equipment optimization? This could include services through ISO 50001, a strategic energy management program, continuous energy improvement, lean, sixsigma, kaizen, total quality management or another continuous improvement initiative. 1) Yes. 2) In process. 3) Planning to. 4) No. 96) Refused. 97) Don't know. 99) Not applicable.	1) Yes.		
	D11. Are these equipment optimization initiatives included in facility key performance indicators or KPIs? 1) Yes. 2) No. 96) Refused. 97) Don't know.	1) Yes.		
	D12. Now focusing on production processes within your facility, has your facility adopted initiatives that contribute to energy process optimization? Again, this may include I-S-O 50001 or another initiative. 1) Yes. 2) In process. 3) Planning to. 4) No. 96) Refused. 97) Don't know. 99) Not applicable	1) Yes.		
	D13. Are these energy process optimization initiatives included in facility key performance indicators or KPIs? 1) Yes. 2) No. 96) Refused. 97) Don't know.	1) Yes.		
Project Register	D6. In what way does your company document potential energy efficiency projects and track progress on these activities over time? 1) Project or Opportunity Register. 2) Tune Up Action Item List. 3) Energy Management Tracking Software. 4) Updating Energy Management Plan/Policy. 5) Does Not Document Potential Energy Efficiency Projects. 6) Other.	1) Project or opportunity register, 2) Tune up action item list, or 3) Energy management tracking software	Project Management	Documents related to energy management _____. 1) Do not exist. 2) Include an energy commitment and goal. 3) Include assigned roles and responsibilities. 4) Include a detailed energy project history. 5) Include current Standard Operating Procedures (SOPs).

Assessment Tool Sub-element	Assessment Tool Questions	Required Response(s) for Full Adoption	EMA Tool Assessment Point	EMA Tool Questions
			Project Management	Energy improvement efforts include tasks that _____. 1) Are not tracked. 2) Are informally tracked (verbally or through email). 3) Are listed in informal spreadsheets and documents. 4) Are formally tracked in standardized documents. 5) Are monitored for progress, include target completion dates, and identify the responsible individuals.

The Market Evaluation Team's assessment tool asks whether an EMA has recently been conducted. The implementation team does not ask about this because their tool *is* the EMA. The EMA tool asks similar questions about energy mapping and energy performance goals, but it asks different, more detailed questions about documenting progress, pertaining to the Project Register sub-element.

Employee Engagement

The assessment tool considers the CEE criterion for employee engagement met if the customer can name just one employee engagement activity conducted within the last three years, such as a training or awareness campaign. The EMA tool asks six different questions about employee engagement (see Table 11) and averages the score from these six questions. This is one particular area where the EMA tool could show an average score of 2 or below, while the customer meets the CEE criterion because they conducted an activity in the past three years.

Table 11. Comparison of Employee Engagement Questions

Assessment Tool Sub-element	Assessment Tool Questions	Required Response(s) for Full Adoption	EMA Tool Assessment Point	EMA Tool Questions
Employee Engagement	D15. Has the energy manager or team conducted any specific employee engagement activities around energy management or conservation in the past 2 years? 1) Yes. 2) In process. 3) Planning to. 4) No. 96) Refused. 97) Don't know. 99) Not applicable	1) Yes or 2) In process	Employee Engagement	Training _____. 1) On energy-related topics is not provided. 2) Is provided for lean or other continuous improvement practices. 3) Is provided to increase general awareness of energy efficiency. 4) Is provided to increase specialized energy-related skillsets. 5) Is provided to increase specialized energy skillsets according to a training plan.
	D15a. Has the energy manager or team conducted any specific employee engagement activities around energy management or conservation in the past 3 years? [IF NEEDED: includes any activities that involve staff outside an energy team, such as engaging staff to turn off equipment when not used, awareness campaigns, etc.] 1) Weekly 2) Monthly 3) Quarterly 4) Annually 5) Less frequently than annually 6) Not at all 96) Refused. 97) Don't know. 99) Not applicable	1) Weekly 2) Monthly 3) Quarterly 4) Annually		
			Employee Engagement	Employee energy awareness includes knowledge of_____. 1) [Employee awareness is limited.] 2) Energy goals and policies. 3) How to identify energy waste. 4) How to implement or report energy saving opportunities. 5) Energy optimization SOPs.

Assessment Tool Sub-element	Assessment Tool Questions	Required Response(s) for Full Adoption	EMA Tool Assessment Point	EMA Tool Questions
			Employee Engagement	The people at my facility who are aware of energy efficiency best practices include _____. 1) No one. 2) A small number of individuals. 3) An energy team. 4) Employees who manage or operate the systems and equipment that use the most energy. 5) All of our employees.
			Employee Engagement	Employees know_____. 1) That energy is the responsibility of a few individuals, but they don't know who. 2) That their energy ideas and concerns are heard. 3) They directly influence energy performance. 4) Where they are authorized to make immediate improvements. 5) That they have wide latitude and trust when it comes to making energy improvements.
			Employee Engagement	Employee suggestions are _____. 1) Not currently collected. 2) Collected only on general topics. 3) Collected on energy topics. 4) Vetted regularly. 5) Often implemented.
			Employee Engagement	Employee contributions are recognized_____. 1) Infrequently. 2) Informally. 3) Through established processes. 4) Through compensation or other awards. 5) Publicly, by senior leaders.

Implementation

The assessment tool asks customers about energy efficiency-related activities completed within the past three years. The EMA tool does not directly assess these same activities, but it includes similar concepts as response options to other EMA questions. For example, the EMA tool includes this question, assessing whether efficiency is important in replacing equipment: "Capital projects are implemented to specifically _____. 1) [Not currently implemented.] 2) Address equipment failure. 3) Improve safety or quality. 4) Improve productivity. 5) Improve energy performance." Table 12 shows the question used in the assessment tool to measure the implementation subelement.

Table 12. Assessment Tool Implementation Questions

Assessment Tool Sub-element	Assessment Tool Questions	Required Response(s) for Full Adoption
	D14. Has your facility completed any energy or process efficiency projects or initiatives within the past 3 years? 1) Yes. 2) In Process. 3) Planning To. 4) No. 96) Refused. 97) Don't know.	1) Yes or 2) In process

Reassessment

The assessment tool asks customers how frequently they reassess their energy management plans; to meet the full adoption criteria, they must reassess their plan at least annually. As shown in Table 13, the EMA tool asks about four different aspects of reassessment and averages the responses, presenting another area where results could potentially vary between the two tools. In this case, the assessment tool's criteria for full adoption correlates to a 5 response to the EMA tool question about reassessing energy goals. Customers could conduct other reassessment activities measured by the EMA tool to meet the CEE criteria, but they would not qualify for full adoption, according to the assessment tool criteria.[3]

[3] The CEE Reassessment sub-element states [emphasis added]: "Periodically review energy performance by comparing actual energy consumption to expected energy consumption. Reassess *goals, metrics, and planned projects* to ensure that these align with business and energy performance priorities."

Table 13. Reassessment Questions Comparison

Assessment Tool Sub-element	Assessment Questions	Required Response(s) for Full Adoption	EMA Tool Assessment Point	EMA Tool Questions
Reassessment	D16. How often do you revisit your energy management project plan? 1) Weekly 2) Monthly 3) Quarterly 4) Annually 5) Less frequently than annually 6) When operations change 7) Have not revisited plan 8) Plan too recently established 95) Other 96) Refused 97) Don't know 99) Not applicable	1) Weekly 2) Monthly 3) Quarterly or 6) When Operations Change	Reassessment	Past energy improvement records are _____. 1) Not documented. 2) Inaccessible. 3) Readily accessible by a few individuals. 4) Readily accessible a large number of individuals. 5) Regularly accessed and used.
			Reassessment	Our energy goal_____. 1) Does not exist. 2) Is in development. 3) Exists, but is outdated. 4) Is renewed at least every three years. 5) Is renewed annually.
			Reassessment	Regular reviews of energy performance metrics _____. 1) Are not performed. 2) Focus on utility bill data. 3) Focus on key performance indicators. 4) Include a comparison to a baseline. 5) Incorporate all major energy drivers.
			Reassessment	Completed energy improvement projects are reevaluated _____. 1) [Projects are not documented.] 2) Rarely. 3) After spikes in energy spend. 4) As warranted by changes in energy intensity. 5) As part of procedure.

System for Measuring and Reporting Energy Performance

The market adoption tool contains four sub-elements under the System for Measuring and Reporting Energy Performance: Measurement, Data Collection, Analysis, and Reporting. The EMA tool uses three similar categories: Data Collection and Availability, Analysis, and Reporting.

Measurement, Data Collection, and Analysis

The market adoption tool's Measurement, Data Collection, and Analysis sub-elements ask about activities similar to the EMA tool Data Collection and Availability and Analysis assessment points. Table 14 compares questions for these sub-elements and assessment points. Both tools ask whether and how energy data are collected and how energy calculations are performed. The EMA tool asks for more details about how energy data are used. Results between the tools may be difficult to compare as these three categories overlap, and similar activities are measured under different sub-elements or assessment points.

For example, the assessment tool question "Is your facility currently using a tool to track energy use over time?" is included under Measurement, but it also is relevant to the Analysis sub-element, and it could be an activity similar to the energy model's response to the EMA tool Analysis sub-element question: "Energy consumption and energy driver data _____."

Table 14. Measurement, Data Collection, and Analysis Questions Comparison

Assessment Tool Sub-element	Assessment Tool Questions	Required Response(s) for Full Adoption	EMA Tool Assessment Point	EMA Tool Questions
Measurement	D7. Is your facility currently using a tool to track energy use over time? 1) Yes 2) In Process 3) Planning To 4) No 96) Refused 97) Don't know	1) Yes or 2) In process	Data Collection & Availability	Energy use, energy driver and other critical data is_____. 1) Not available. 2) Located In multiple places and formats. 3) Centrally located. 4) Easy to access and analyze. 5) Stored in an automated system that supplements data analysis.
			Data Collection & Availability	Energy data is immediately available to_____. 1) Few if any staff at this location. 2) Select individuals. 3) The Energy Team. 4) Operations. 5) All employees.
Data Collection	D17. How frequently is energy performance reviewed? 1) Daily 2) Weekly 3) Monthly 4) Quarterly 5) Twice a Year 6) Annually 7) Varies 95) Other 96) Refused 97) Don't know 99) Not applicable	1) Daily 2) Weekly 3) Monthly	Data Collection & Availability	Energy data are_____. 1) Used for finance and accounting purposes only. 2) Used for individual projects as needed. 3) Used to troubleshoot cost spikes. 4) Used regularly to make operational decisions. 5) Used to make real-time operations decisions.

Assessment Tool Sub-element	Assessment Tool Questions	Required Response(s) for Full Adoption	EMA Tool Assessment Point	EMA Tool Questions
Analysis	D18. Has your facility established an energy consumption baseline? 1) Yes 2) In Process 3) Planning To 4) No 96) Refused 97) Don't know 99) Not applicable	1) Yes	Analysis	Energy consumption and energy driver data are_____. 1) Treated separately. 2) Visually compared to determine their interrelationships. 3) Combined in key performance indicators (kWh/widget). 4) Combined in an energy model that tracks energy and savings. 5) Used to determine the cause of any change in energy performance.
			Analysis	Energy calculations are _____. 1) Rarely performed. 2) Performed for basic unit conversions (e.g., hp to kW). 3) Performed to estimate energy use for individual pieces of equipment. 4) Performed as part of in-depth engineering analysis. 5) Performed as part of in-depth statistical analysis.

Reporting

The assessment tool asks customers how frequently they share energy performance data with senior management or company stakeholders, and it considers the CEE criterion met if data are shared at least annually. The EMA tool asks three questions about sharing energy performance progress, as shown in Table 15, and averages the scores. A response score of a 3 for any EMA tool questions would meet the minimum assessment tool criteria for full adoption, though a customer could have a low EMA tool score while meeting the assessment criteria if they answered a 3 for one question but responded with a 2 or below on the other two questions.

Table 15. EMA Tool Reporting Assessment Point Questions

Assessment Tool Sub-element	Assessment Questions	Required Response(s) for Full Adoption	EMA Tool Assessment Point	EMA Tool Questions
Reporting	How often is your facility's energy use data shared with company stakeholders, such as management or operations staff? 1) Daily 2) Weekly 3) Monthly 4) Quarterly 5) Twice a year 6) Annually 7) Varies 95) Other 96) Refused 97) Don't know 99) Not applicable	1) Daily 2) Weekly 3) Monthly 4) Quarterly 5) Twice a year or 6) Annually	Reporting	The senior leadership team receives_____. 1) No information on energy performance. 2) Information on basic utility costs. 3) Basic energy metrics (e.g. KPIs). 4) Normalized energy metrics relative to an established baseline. 5) Benchmarked energy performance relative to similar facilities.
			Reporting	The senior leadership team receives_____. 1) No information about the progress of the energy management program. 2) Informal information about the progress of the energy management program. 3) Qualitative reports on the progress of the energy management program. 4) Annual Energy Management Assessment reports. 5) Frequent updates on specified metrics relating to the energy management program.
			Reporting	External stakeholders such as utilities_____. 1) Are not currently included in any aspect of our energy program. 2) Were informed of our energy program's launch. 3) Help determine our energy program's goals. 4) Regularly receive information on our progress. 5) Are invited to supplement our internal resources.

Additional EMA Tool Questions

The Implementation team's EMA tool contains five other questions under the Project Management assessment point that do not directly map to any of the above categories:

1. Our organization knows an energy project is successful when_____. 1) Project construction is complete. 2) We get our incentive check. 3) Our energy bill is lower. 4) We see evidence in our energy intensity model(s). 5) We have verified savings, or have commissioned the project.

2. Capital projects are implemented to specifically _____.1) [Not currently implemented.] 2) Address equipment failure. 3) Improve safety or quality. 4) Improve productivity. 5) Improve energy performance.
3. We identify and eliminate energy waste through operations and maintenance projects_____.1) Rarely. 2) When the opportunity presents itself. 3) On the recommendation of third parties. 4) Through regularly scheduled Kaizen or Treasure Hunt efforts. 5) By training and empowering employees to find, report and act on opportunities.
4. We manage energy costs by_____.1) No methods. 2) Reviewing our utility bills for accuracy. 3) Scheduling meetings with account managers in response to a high bill. 4) Holding annual meetings with utility account managers. 5) Actively engaging utility representatives.
5. When investing in energy efficiency projects, we consider _____.1) [We don't do energy efficiency projects.] 2) The initial cost of equipment. 3) Benefits to productivity. 4) The cost of maintenance. 5) Total cost of ownership.

Comparison of CEE and Market Evaluation Definitions for SEM Subelements

Table 16 presents the assessment tool definitions for each subelement (as adapted for the NYSERDA CEI Market Evaluation from the CEE Minimum Elements). Table XX presents the EMA tool's description of each of its subelements (known as assessment points).

Table 16. Minimum SEM Elements

CEE Minimum Element	CEE Minimum Element Definition	Criteria Assessed for SEM Baseline
Company Commitment	**In an industrial organization, clear commitment is vital for SEM to succeed. Senior managers must undertake the following activities:**	
1a. Efficiency Attitudes	N/A	Management has expressed that energy and process efficiency are at least somewhat important to maintain a competitive advantage.
1b. Policy and Goals	Set, frame, and communicate long-range energy performance objectives through an energy policy and energy reduction goals	Facility has a written energy plan or policy; has set energy reduction goals; has communicated goals to staff.
1c. Resources	Ensure that SEM initiatives are properly resourced for goal attainment, including assigning responsibility or accountability to an individual energy champion, energy team, or support of employee engagement activities	Facility has a team with responsibility for energy performance that meets at least once per quarter; facility has at least minimal staff and funding support needed to manage energy performance.
Planning and Implementation	**Planning provides the foundation for a customer to strategically manage energy. Implementation translates planning into actions that improve efficiency. Planning and Implementation consists of the following activities by the energy champion or team:**	
2a. Energy Management Assessment	Assess current energy management practices by using a performance scorecard or facilitated energy management assessment	Facility has completed a review of equipment and energy bills to identify savings opportunities, and completed an organizational assessment for SEM.
2b. Energy Map	Develop a breakdown or map of energy end uses and costs across the company	Facility has developed an energy map to identify the key energy drivers and end uses.
2c. Metrics and Goals	Establish clear, measurable goals for energy performance improvements, based on analysis of baseline energy consumption and relevant variables of energy consumption	Facility has defined energy performance goals in terms of energy consumption quantities, or a percentage reduction in use, and has committed to goals as part of facility KPIs.
2d. Project Register	Describe actions to be undertaken over one or more years; these can be behavior or capital improvements	Facility has list of potential projects and has revisited the list or energy management project plan at least once.
2e. Employee Engagement	Develop and implement a plan to educate employees about their activities' energy impacts	Facility has conducted any employee engagement activities related to energy or conservation in the last 2 years.
2f. Implementation	Complete measures in the project register	Facility has completed at least one process or energy efficiency project in the last 2 years.

CEE Minimum Element	CEE Minimum Element Definition	Criteria Assessed for SEM Baseline
2g. Reassessment	Periodically review energy performance by comparing actual consumption to expected consumption, and use this information to reassess goals, metrics, and planned projects	Facility has revisited the project register at least once.
System for Measuring and Reporting Energy Performance	**Industrial organizations should monitor and report energy performance according to their goals and should regularly analyze actual consumption against estimated consumption**	
3a. Measurement	Regularly collect performance data to understand energy use; this subelement should capture all relevant energy consumption variables, including production and weather	Facility uses a tool that tracks energy use over time.
3b. Data Collection	Collect and store energy performance measurements versus goals in commonly available formats	Facility reviews energy performance at least monthly.
3c. Analysis	Create a baseline of energy consumption and a model to predict energy consumption; regularly update the model	Facility has established an energy consumption baseline.
3d. Reporting	Provide internal and external stakeholders with the results of energy initiatives and achievements compared to goals	Facility shares facility energy use with stakeholders such as management or operations staff.

Table 17. EMA Tool Assessment Point Descriptions

Assessment Point	Description
Policy & Goals	Formalized (written) energy policy and energy goal
Resources	People and capital devoted to energy efficiency
Communication	Company-wide practices for sharing energy information
Project Management	The organization's structure allows for the effective pursuit of energy projects.
Employee Engagement	Employee awareness, training and involvement
Reassessment	Regular reviews to make energy practices and savings stick
Data Collection & Availability	Frequency and ease of using energy information
Analysis	Active consideration of the energy model and KPIs to assess energy impact
Reporting	Who receives and tracks information on SEM practices and energy projects?

Appendix E. EMIS Providers Interview Guide

EMIS Provider Interview

Interviewee Name: _____ Interviewee Company: _____

Interviewee Email: _____ Interviewee Phone: _____

Interview Date/Time: _____ Interviewer: _____

These interviews will collect information to inform a qualitative assessment of the market for Energy Management Information Systems (EMIS) in New York. The Market Evaluation Team developed research objectives for these interviews that encompass the qualitative research questions in the workplan (Table 8) and certain market progress indicators that relate to EMIS providers. Table 18 maps the interview guide questions in this document to specific research topics for the Continuous Energy Improvement market evaluation.

Data collection Method:	Phone interview
Estimated Time to Complete:	30-45 minutes

Table 18. Question Mapping

Section	Research Objective	Interview Question
Company Products, Services, and Offerings	Determine characteristics of EMIS providers	C1-C7, C14, E5
	Characterize the types of EMIS systems and services available in the market	C8, C9-C12
	Assess whether EMIS providers are offering systems with industrial operational control, and if customers are adopting those systems.	C11, C13, C14
Marketing and Customer Engagement	Identify how EMIS providers market themselves and interact with customers	D1-D6
Market Adoption and Barriers	Identify the characteristics of customers that purchase EMIS software, ongoing service agreements, and industrial operational control systems.	E1, E2, F2
	Monitor market demand for EMIS software at industrial and manufacturing facilities.	C11-C14, E3-E6, E9-E12
	Monitor market demand for EMIS support services.	C9, C13, E3-E6
	Assess rate of adoption and persistence of technology use (systems and subscriptions and other services)	C12-C14
	Identify barriers to market adoption, and potential solutions	E7 - E13, F1

A. Recruiting Script

Email:

Subject: Requesting your input: NYSERDA EMIS Market Evaluation

Dear **[POTENTIAL INTERVIEWEE NAME],**

I received your contact information from NYSERDA, as one of the technical firms that works with industrial clients to provide energy management information systems (EMIS).

My firm, Cadmus, is conducting a market baseline study for NYSERDA, to assess the adoption of energy management practices among New York industrial facilities. As part of our study, we are interviewing EMIS providers in the state to learn more about the existing demand for these systems, and related software and services. NYSERDA will use this baseline study to evaluate the need for programs that could help you offer energy management services to your customers.

I expect this phone interview to last from 30-45 minutes. Your responses will be kept confidential. We will not use your name or the name of your firm in our report, and we will not share your responses with NYSERDA.

To make this as convenient as possible for you, I will follow up this email with a phone call in the next day or so in order to schedule a time for the interview. Or, if you prefer, you can reply to this message with a time that works best for you.

Thank you in advance for your help!

Regards,

[**CADMUS NAME**]

If you have questions about this study, please contact myself or Carley Murray, NYSERDA Project Manager, at carley.murray@nyserda.ny.gov.

B. Introduction

Thank you for making the time to speak with me today. My firm has been hired by NYSERDA to assess the market for industrial energy management information systems in New York state. As part of that evaluation, we are speaking with firms like yours to better understand the current level of awareness and adoption of strategic energy management practices, software, and services.

We will not use your name, or the name of your firm, in our final report. The interview will take from 30-45 minutes.

Do you have any questions before we begin?

C. Company, Products and Services

First, I have some basic questions about your company and the products and services you offer.

C1. Please tell me a little bit about your role in your company. What are your main responsibilities?

C2. Do you consider your company to be a software company, a hardware provider, an energy services company, a business management company, or something else?

C3. What products and services does your company offer? (PROBE: develop software outside of EMIS? Offer subscription services? Detail on specific products will be captured below.)

C4. How long has your company been offering EMIS software? When was the company founded (if different from previous)?

C5. What percent of your annual revenue would you say comes from EMIS products and services? An estimate is fine.

C6. Where are most of your customers located? Do you sell to customers outside New York? What percentage of your company's overall EMIS business do New York customers represent?

C7. Do you serve commercial customers as well as industrial customers? How do the two markets differ, in terms of the products and services they need?

C8. Can you describe the EMIS software you offer? What features do different packages include? Can you describe the price range, or the difference between a lower-end and a higher-end system?

C9. What other services or technologies do you offer in parallel with EMIS? Are any of these offered as subscription services?

C9a. (If subscriptions offered) Can you describe a typical industrial EMIS subscription service? For example, what services are provided? Is there a monthly charge? Are there additional fees for added services? How long is the typical contract or engagement?

C10. Do customers purchase a license to use the system? Is this different from a subscription service?

C11. Do you offer systems that include industrial operational control (the capability to turn equipment on/off or change settings)? What does this entail? Is there additional hardware required?

C12. For our study, we are hoping to provide quantitative estimates of the total sales of new EMIS systems and new service subscriptions in New York last year. Can you tell me how many new EMIS systems you sold in New York state last year, and how many new subscriptions? (IF NEEDED: If you do not have these numbers off-hand, could I follow up with you via email?) (IF NEEDED: We will only report sales numbers in aggregate across all interviewees.)

C13. (If subscriptions offered in C9) How many active service subscriptions do you have with New York industrial customers? What percentage of these have renewed their service in the past year?

C14. Of the EMIS you installed in New York last year, do you know how many monitored only a certain area within a facility, how many were facility wide, and how many were installed across multiple facilities? (If they indicate they offer in C11) Do you know how many included integrated operational controls?

D. Marketing and Customer Engagement

Thank you. My next questions address how you find new customers.

D1. How do you market your EMIS products and services? How do you introduce customers to the idea of EMIS? (Probe: Website, online advertising, conference and trade shows, delivered through energy consultants or other service providers?)

D2. Do you primarily sell directly to a firm or facility, or do you use other sales channels, such as engineering consultants? (Probe: what other channels?) If so, what percentage of your EMIS sales does this channel represent?

D3. Do you emphasize off-the-shelf system purchases, or subscriptions, or other types of solutions?

D4. What happens when a customer purchases an EMIS? How does it get installed, how much customization is required? How long does the installation process take?

D4b. If purchasing a subscription, what services does that include and how are services provided (i.e., emailed report? Web-access portal? Custom or ad-hoc analysis?)

D5. Do you offer training to your customers' staff? If so, how often? What does that training consist of? What is the title/role of the person who typically attends training? (i.e., facility manager? Lead electrician? Specific floor staff?)

D6. How do you manage relationships with your customers – is there an account manager, or a support website, or call-in number?

E. Market Adoption and Barriers

Now I have a few questions about the market in New York and about challenges and barriers you have experienced in industrial energy management.

E1. What industries do you primarily work with? What size facilities? Do you serve a particular region of the state, or type of industry, or size of facility?

E2. How would you characterize a typical customer? (PROBE: A company with many facilities, or a single facility? What size (in terms of employees, or equipment to be monitored?) What level of sophistication with regard to their energy usage and goals?) What types of customers purchase only software, as opposed to subscription services? What type of customers purchase operational controls integrated into their system?

E3. What do you think is driving demand for EMIS? Do your EMIS customers want to reduce energy costs, or just streamline processes and make production more efficient? Are customers worried about total energy usage costs, or about demand/time of use, or both?

E4. How has the demand for EMIS in New York changed in the last 5 years? (PROBE FOR SPECIFICS: increases in sales, increases in providers, more inquiries from potential customers, etc.)

E5. How many other firms or consultants would you estimate provide EMIS products and services in New York state? How have the number and types of firms providing these services changed over time?

E6. What proportion of New York industrial firms do you estimate are aware of EMIS?

E7. What challenges have you experienced introducing EMIS to your industrial clients? Do you see any barriers which are specific to particular types of industries?

E8. How have you overcome these challenges?

E9. What challenges do your industrial clients have implementing an EMIS? (PROBE: the upfront cost, integrating the system into operations, understanding how to best use the information provided, data security, data access, etc.)

E10. How have your industrial clients overcome these challenges?

E11. Are you aware of NYSERDA's pilot program for EMIS software for industrial facilities? How do you expect NYSERDA programs will impact your business?

E12. Do you have any concerns about NYSERDA's plans?

E13. What else is needed to promote market adoption of EMIS?

F. Wrap up

We are almost finished, I just have a couple more questions about your experience and hopes for the future.

F1. What changes, if any, do you expect in the demand for (industrial) energy management information systems in the next five years? Why do you say that?

F2. Do you have any EMIS studies or industrial client testimonials you would be willing to share?

Thank you for talking with me today.

To learn more about NYSERDA's ongoing Continuous Energy Improvement initiatives, please visit NYSERDA.com.

Appendix F. EMIS Market Adoption Forecast Detailed Results

The Market Evaluation Team convened a panel of 8 experts in the fields of industrial EMIS and CEI adoption, to estimate market adoption of EMIS by industrial facilities in New York from 2017 to 2037. This section presents the background information and instructions for estimating the curve shared with panelists, as well as the panelists comments explaining their estimates.

Background Information on EMIS[4]

Continuous Energy Improvement Initiative

In its 2016 Clean Energy Fund Investment Plan, NYSERDA proposed a Continuous Energy Improvement (CEI) Initiative to address energy efficiency opportunities in the industrial sector. Under this initiative, NYSERDA launched two industrial CEI pilot programs in 2017:

1. The Strategic Energy Management (SEM) pilot pairs participating industrial facilities with an energy coach to help them understand and integrate SEM practices, including the use of an energy management system such as an EMIS.
2. The On-site Energy Manager pilot provides a dedicated on-site energy management consultant to each participating facility for 12 to 15 months. Facilities may participate in more than one pilot.

In 2018, NYSERDA launched a third pilot under its CEI Initiative, to promote adoption of EMIS by industrial facilities. The pilot funds an EMIS and subscription reporting and analytic services for participating firms identified through qualified EMIS providers. By 2019, NYSERDA expects to have qualified six to 10 qualified EMIS providers, and to have 12 to 20 participating facilities.

About the New York Industrial Sector

New York has approximately 6,923 industrial facilities. The majority, 84%, have annual energy expenditures under $500,000. Another 12% of facilities have annual energy expenditures from $500,000 to about $1 million, and the remaining 4% have energy expenditures that exceed $1 million.

[4] Following Round 1, the Market Evaluation Team issued a clarification to all panelists: "The systems we would characterize as EMIS operate at the whole building (or at least, production line) level, but do provide more granular data. Through modeling or submetering, or some other method, the EMIS will estimate energy usage by different equipment within the facility. However, the EMIS is bigger than just a single piece of equipment. It is able to aggregate energy usage from the whole facility to track total energy usage."

NYSERDA expects that the most energy-intensive industries—those that use the most energy per unit of production—are the most likely to adopt CEI practices, including use of an EMIS. In New York, the most energy intensive industries include the following:

- Chemical Manufacturing
- Paper Manufacturing
- Food Manufacturing
- Nonmetallic Mineral Product Manufacturing
- Plastics and Rubber Product Manufacturing
- Fabricated Metal Product Manufacturing

Together, these industries make up about 38% of all the industrial facilities in New York.

About EMIS

EMISs are software tools utilized to store and analyze energy and production data streams in real time. An EMIS provides visualization and analysis of energy consumption in parallel with production data. The EMIS will track progress on energy or process efficiency projects, and often identifies opportunities for additional savings. Unlike equipment or system-specific systems, an EMIS monitors energy usage at the whole building level.

No robust estimates exist of the number of industrial EMIS systems available in the market, but recent research indicates the number is growing.[5] Both commercial and industrial EMISs exist, with commercial systems being more common than industrial systems. In 2017, NYSERDA identified about 75 providers that market commercial EMIS systems in New York, and six to10 vendors that market industrial systems. (Note that this exercise is focused **exclusively on industrial systems**.)

As part of the market evaluation for CEI, NYSERDA conducted a detailed survey of New York industrial facilities in 2017. Survey results indicated **only 2% of facilities** were using an EMIS.[6]

*Please select the **'Instructions'** tab above to continue.*

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[5] Crowe, Eliot and Nick Leritz. Industrial Energy Management and Information Systems for Strategic Energy Management Applications. ACEEE Summer Study, 2015. Available online: https://aceee.org/files/proceedings/2015/data/papers/1-146.pdf

[6] Cadmus. Continuous Energy Improvement Evaluation 2017. Prepared for New York State Energy and Research and Development Authority. September 2017. Available online: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/2017-Continuous-Energy-Improvement-Baseline-Market-Evaluation.pdf

Estimation Instructions

This exercise seeks your expert opinion on the likely rate of adoption of an EMIS by New York industrial facilities from 2017 to 2037, assuming ***NYSERDA's pilot programs did not exist.***

You will use the tab labeled "Adoption Rate Estimate" above to provide your best estimate of the cumulative market adoption for EMISs from the year 2017 to the year 2037. Keep in mind the following considerations as you make your estimate:

- Your forecast should assume that **no NYSERDA market intervention** takes place. In other words, we want the forecast in the absence of NYSERDA's programs.
- Please consider the **New York market only**.
- New York has approximately 6,900 industrial facilities of which:
  - 84%, have annual energy expenditures under $500,000;
  - 12% of facilities have annual energy expenditures between $500,000 and $1 million;
  - 4% have energy expenditures that exceed $1 million

To provide your estimate, you will adjust the shape of the blue market share curve, and then provide a brief description of your rational for the shape that you chose.

To adjust the curve, use the three sliders on the right:

1. The top slider at the left of the graph (labeled Max Market Adoption) allows you to estimate maximum market share you think would be reached by 2037 in the absence of NYSERDA's CEI Initiative. We suggest you adjust this slider first. Sliding the bar to the right increases the maximum market share and to the left decreases maximum market share.

2. The second slider, labeled Leading Behavior, allows you to indicate when you believe market adoption would begin to substantially increase, in the absence of the NYSERDA program. Sliding the bar to the right indicates adoption accelerates closer to the starting year of 2017. Moving the bar to the left estimates acceleration in market adoption will begin further out in time.

3. The third and bottom slider, labeled Following Behavior, allows you to estimate the diffusion beyond early adopters in the market. Sliding the bar to the right increases the steepness of your curve. The farther to the right the slider is, the faster you think the majority of market will adopt the practices. If you think adoption will be more gradual and slower, slide the bar to the left.

As you are moving the sliders, you can view a text description of your curve in the **Interpretation** box below the graph. Continue to adjust the sliders until you are satisfied with the specific parameters of your curve.

Note: This tool allows you to change the 2017 market penetration of EMIS from the initial value of 2%, but please DO NOT do so. Based on recent survey results, 2% of industrial facilities had an EMIS in 2017.

Once you have established your market adoption forecast, provide some comments supporting your forecast in the **Comments** box at the bottom of the screen. Comments should describe your rationale for setting each of the three bars – the maximum market share, the degree of leading behavior, and the degree of following behavior.

If you would like to exit before finalizing your forecast and come back to it later, click on the **Save** button in the bottom left-hand corner of your screen. This will save your work and you can return later to complete it.

When you are satisfied with your forecast and your interpretation, click the **Submit** button to record your response. Note: once you click the Submit button, you will no longer be able to make changes.

If you submit your response and haven't yet provided any comments, the system will prompt you for your comments as part of recording your input. Once you have input comments, you will be able to submit and exit the tool.

Panelist Explanations for Estimates

Table 19 provides each panelist's comments explaining their estimates in Round and Round 2. In some cases, comments have been edited to maintain the anonymity of the panelist.

Table 19. Delphi Panelist Comments Explaining Round 2 Estimates

Panelist	Estimated 2037 Market Share	Round 1 Comments[a]	Round 2 Comments
1	22%	*I anticipate EMIS adoption will continue to grow slowly in the absence of NYSERDA programs. Growth of connected/IoT technologies should reduce the complexity and cost of EMIS over the next ~10 years, which will accelerate growth. However most facilities with energy expenditures under $500k are not likely to adopt EMIS in the absence of program support.*	*It was interesting to see the very significant variation in the panelists' Rd 1 predictions, and it suggests this market is difficult to estimate. Given that my Rd 1 estimate ended up near the average, I don't see a strong justification to change it.*
2	19%	*The industrial sector is much further behind the commercial sector where I estimate 10% of the large commercial market has adopted EMIS. There are more hurdles for data acquisition with industrial process data. Early adopters influence behavior to adopt EMIS as businesses want to keep pace with their peers. Adoption will be slow without supports to encourage businesses to tackle data acquisition challenges and help interpret analytic results.*	*I did not mean to say that 2017 market penetration is 0%. I cannot figure out how to change this to the 2% found in the market study. Even though I am below the average response, I still feel I my estimates may be optimistic. There is a lot of work to do to make industrial EMIS a reality.*

3	30%	*Reasoning for low uptake of EMIS in the absence of program funding and support:* *1. Industries are still very project focused (in regard to energy efficiency) and the main driver for doing these types of projects is equipment end of life, reduced operating costs, or increased productivity (throughput).* *2. Using information to manage energy in a systematic way requires buy-in from a senior management level within an organization, along with assignment of roles and responsibilities throughout that organization to ensure that energy is managed on a continual basis as part of a business process. Typically this requires the selling of the organizational system to the management level within an organization which can be challenging and time consuming.* *3. The majority of the market identified is small industry, these industries typically will not have the capital, human resources, and in some instances the technical capacity to implement an EMIS and manage their energy consumption/demand. I think it will be much harder for small industries to adopt EMIS on their own* *Assumptions are based on the organizational management of energy using energy performance information, not just the technology component of EMIS.* *In other jurisdictions market uptake is slow and low even in the presence of programs that provide substantial funding and aggressive recruitment. In addition, without external driving forces (government imposed carbon tax/etc.), there is little motivation for organizations to invest in energy management.* *With the revised information that the majority of the market is under $500K spend, I believe the uptake will be even less than originally estimated as smaller organizations have less resources (capital and organizational capacity) to implement EMIS, even with programs and rebates in place this is still a difficult market to penetrate for energy management systems.*	*When considering the feedback of others, and the low uptake experienced in other jurisdictions with heavily supported programs, it is unlikely that organizations will implement EMIS on their own accord. Large (multi-million) companies may implement metering on their own, however actually using that to identify and implement changes that generate savings is unlikely in the absence of expertise, and financial support to offset the cost of the expertise.*

4	5%	*Personally, I think that the area that would see the most benefit from an EMIS system is the large industrial group > $1M spending, even $1m spending is a difficult sell as the payback just is not there, I would suggest industries with $10M+ would be the cut off for groups taking actions on their own. This statement comes from years of looking for ways to reduce the cost of systems to a point that they will be adopted by smaller industries. It seems the only way to get them on board is with capital investment. I have seen assistance offered for engineering services associated with energy management but it seems to be only the assistance that provides capital work.* *Also the background information suggests that an EMIS system is managed by only a main service meter, nothing could be further from the truth. It is common knowledge that changes to energy consumption less than 10% of total energy simply get lost in system noise. Metering is required at specific pre studied locations to properly manage energy.* *As for the low adoption or following rates, I contribute these to a number of factors, 1: without funding for capital very few will realize the benefits, a company's primary concern is making product not saving energy, unless there is a mandate from above or a government regulation and penalties to make it happen. 2: lack of experienced people/skills in energy management 3: confusion as to what energy management is? Its not about changes to equipment to improve energy efficiency, its about using what you have in the most effective way with the least amount of capital investment. 4: some companies will follow the leaders but only if it is affect the bottom line (like losing customers to a competitor that has lowered the cost per unit by lowering energy costs.*	*Based on your definition of EMIS as a whole site energy management my curve submission should be closer to the average, but this is not how EMIS works, also without significant investment it is very difficult to justify investment in the Capital/people/knowledge required for a system. Therefore I believe the average to be a valid curve profile but high in magnitude. I also feel strongly that meaningful self-adoption will only take place in very large consumers that can easily recoup the capital and on-going cost of running a system.*

5	5%	*1. From our experience, natural adoption of EMIS is very low. I expect carbon pricing to exert more influence in coming years but without NYSERDA support, the adoption will be slow. Another comment I have is that EMIS as a whole building approach in process industries will not optimize market penetration. I think you should revisit your definition of EMIS. Our experience shows that industry responds much more to EMIS when it is seen as an industrial tool that enables them to manage and set targets on significant energy uses within the facility rather than as a means to only look at energy at the facility level.* *2. This exercise is asking us to estimate market penetration as a % of the # of facilities. When we took EMIS to market in 2008 in New Brunswick, we targeted 26 plants that consume 80% of the industrial energy in NB. From them, 14 implemented EMIS. There are maybe 1500 industrial facilities in NB. I am concerned that talking in terms of % penetration of # of facilities is not a great metric. What you want to know is what % of the industrial energy could you engage through EMIS. That is likely a smaller # of facilities but a larger % of industrial energy.*	*I still think market adoption of EMIS without market intervention by NYSERDA will be low as essentially the natural adoption of energy management is low and has been and will continue to grow slowly unless specific interventions are implemented.*
6	24%	*Those spending less than $1M annually will find it hard to justify the cost of implementing EMIS.*	*I still hold my position from Round 1. Those spending less than $1M will have a hard time achieving acceptable ROI. This will greatly prohibit future growth or adoption of industrial EMIS.*
7	22%	*Industrial customers do not make changes easily without program intervention. The starting point of only 2% penetration for EMIS is proof.*	*My estimate is very close to the average, with the average ending up 5% higher in 2037. If EMIS costs decline and there is spillover from other jurisdictions that support EMIS then I could be persuaded that the average is correct, but I will stick with my estimate.*
8	39%	*My opinion based on my experience in dealing with large industrial customers across NY landscape. Although programs are well designed, some customers of this size do not have the adequate resources to fully implement a program of this magnitude. Also, the buy-in from other non-energy related departments within a facility often takes time especially when affecting production within a facility.*	*Readjusted slightly, but higher than overall average based on commitments from customers on these types of initiatives.*

[a]Following Round 1, the Market Evaluation Team issued a clarification to all panelists: "The systems we would characterize as EMIS operate at the whole building (or at least, production line) level, but do provide more granular data. Through modeling or submetering, or some other method, the EMIS will estimate energy usage by different equipment within the facility. However, the EMIS is bigger than just a single piece of equipment. It is able to aggregate energy usage from the whole facility to track total energy usage."