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Agenda

- C1906 Study Objectives
- Detailed Study Design
- Deliverables and Timeline

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Strategic Energy Management

- Strategic Energy Management ("SEM") is a long-term approach to pursue energy efficiency that focuses on setting goals, tracking progress, and reporting results.
- Offered in CT by the utilities as an initiative of Business and Energy Sustainability (BES) program.
- Major objectives:
  - Establish long-term relationships with energy users
  - Target persistent energy savings
- SEM is new in CT and has no participation or energy savings claimed thus far.
- SEM is a behavioral and organizational-based practice and savings estimations are thus "complex".
- Challenges in estimating savings due to limited (less than one year) baseline and monitoring data.

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C1906 Study Objectives

SEM Evaluation Best Practices

- Current state of the SEM program
- Data the programs should collect, analyze, and track for SEM to be evaluated in future
- Refined best practices for estimating program savings (ex-ante and ex-post)
- Barriers to claiming savings

Process Evaluation

- Feedback on the SEM structure from customers, vendors and program managers
- Assess effectiveness and user-friendliness of the program structure

Impact Evaluation

- Impact evaluation of the SEM initiative after utilities begin to claim savings from SEM projects.
- Quantitative assessment of the key drivers to RRs
- Savings estimates of non-SEM project overlap and scored attribution to the SEM program.

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Study Design - Evaluation Methods Development

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SEM Evaluation Complexities

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- SEM programs are complicated to evaluate.
  - Claiming energy savings for C&I customers from behavioral changes is challenging
  - Need to control for factors that influence energy use at facilities (weather, production, capital improvements, etc.)
  - Need for coordination between ex-ante and ex-post impact evaluation
  - Looking for a small effect size at an individual facility
  - Program is targeting large/diverse C&I customers – different businesses, types of equipment
- These challenges are solvable but require a thoughtful evaluation design.
- Refine approach based on best practices in other jurisdictions and tailor to CT.
- Provide defensible energy savings so CT programs can claim them.

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Best Practices Research to Refine Evaluation Methods

- Key topics:
  - Similar SEM programs in other jurisdictions that have measured their outcomes
  - Common SEM program evaluation challenges and strategies to overcome them
    - Standards, guides, and methods to implement and evaluate SEM program outcomes (DOE, LBNL, ACEEE, California, etc.)
    - Examples and cases of SEM program evaluations (Bonneville Power Administration, Energy Trust of Oregon, NYSERDA, Rocky Mountain Power, Vermont Energy Investment Corp., etc.)
- Conduct 15-20 interviews
  - C&I SEM experts identified in literature review
  - SEM program leaders
  - Technical vendors
  - Large customers with active SEM programs in CT (outside of current utility SEM programs)
  - Participants in previous BSC/SEM roundtable cohorts

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Best Practices Outcomes

- Data needed to facilitate ex-ante savings calculations and ex-post SEM impact estimations in the future
- Summary and assessment of implementor savings approaches (ex-ante)
- Recommendations on practical and defensible approaches for estimating ex-ante savings based on open-source methods through literature review
- Impact Evaluation Method for claiming ex-post energy savings from the SEM program
- Best practices for SEM programs

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Study Design – Process Evaluation

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Process Evaluation

- Process evaluation begins after SEM program(s) are rolled out and have participants.
- Areas of focus:
  - Feedback on SEM program structure
    - Gauge effectiveness and user-friendliness of the program
    - Customer and implementer satisfaction
  - Differences in SEM approaches across vendors or utility territories (to the extent possible)
  - Attribution (SEM's role that led to participation in other programs)
- Program documentation analysis
- Conduct deeper research on focus areas listed above by administering surveys for:
  - Participating customers
  - Nonparticipating customers
  - Vendors
  - PAs

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Process Evaluation Outcomes

- Feedback on current SEM program processes – findings about program design, implementation, customer awareness, communication, program influence, project timelines, partial participation etc.
- Recommendations on program improvement and future research/evaluation topics

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Study Design – Impact Evaluation

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Impact Evaluation

- Undertaken with process evaluation after SEM program(s) are rolled out and have participants.
- Ex-post savings estimated using “Best Practices” identified earlier in the study.
- Site-specific M&V plans will be developed and implemented as required
- Analysis methodology will include facility-level regression models which takes billed energy consumption, production with influence from other factors (facility operation, weather etc.)
- Additionally, participant interviews will be conducted on-site to collect data that feeds in to ex-post analysis:
  - Pre-existing conditions, non-routine events, attribution, NEIs, and potential overlap with other capital projects.

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Impact Evaluation Outcomes

- Program-level results (gross kWh, coincident peak kW, natural gas MMBtu, realization rates etc.) using statistical expansion analysis
- Quantitative assessment of the key drivers of the program-level RRs
- Depending on participation, additional post-hoc analysis of program-wide results among different segments will be provided (e.g., by utility, by implementer)
- Total savings estimate of non-SEM project overlap and scored attribution to the SEM

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Deliverables and Timeline

SEM Evaluation Best Practices

- **Timeline** – Q4 2019 – Q2 2020
- **Deliverable** – Evaluation best practices report – *Expected June 2020*

Process and Impact Evaluations

- **Timeline** – Q3 2020 – Q4 2021*
- **Deliverables**
  - Evaluation results report
  - Results presentation webinar

* Based on the timing of process and impact evaluation, there may be single/multiple reports

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C1906 Overall Outcomes

- Recommend practical and defensible approaches for estimating ex-ante savings based on literature review
- Recommend evaluation methodologies based on refinements to best practices for SEM
  - Discuss the options to collect data required to quantify the ex-post program savings and realization rates.
  - Discuss ex-post savings analysis methodologies.
- Provide feedback on SEM program processes based on in-depth interviews with participating and non-participating customers, PAs and vendors
  - Discuss findings about program design, implementation, customer awareness, communication, program influence, project timelines, partial participation etc.
- Estimate ex-post program savings and realization rates from facility-level regression models which takes pre-/post-billed energy consumption into consideration among other factors
- Provide recommendations on future research topics based on study findings.

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Thank You