

MA C&I Deep Energy Retrofit Guidebook

A Guide to Participation and Benefits

Updated 1/18/2024



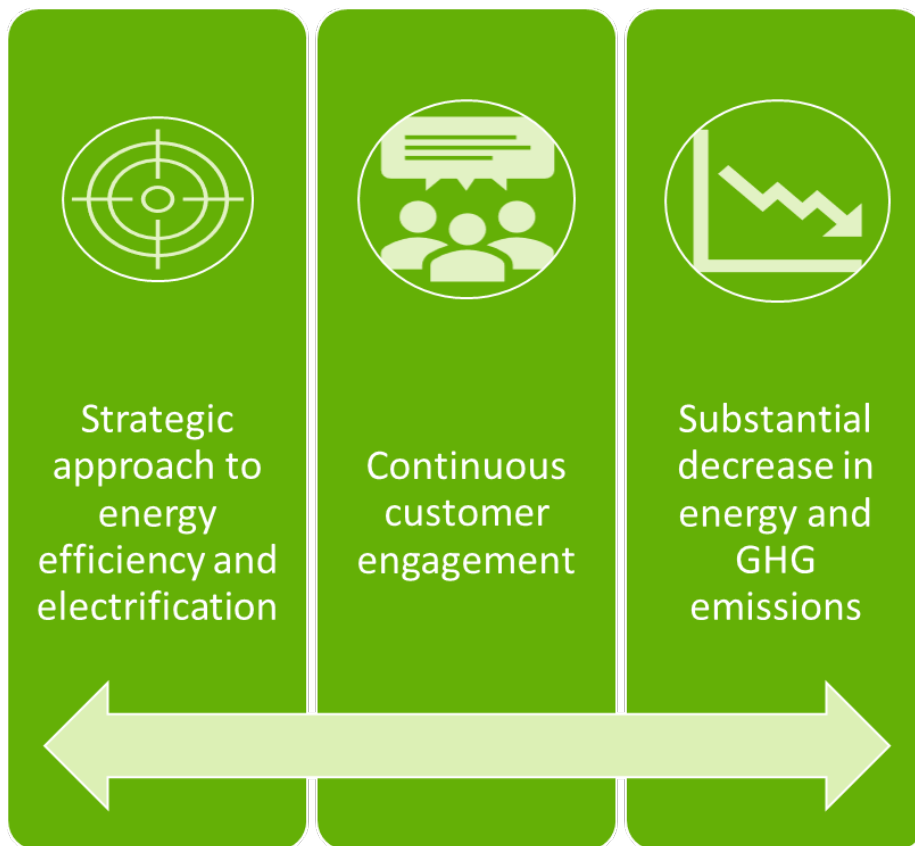
Contents

- Introduction to the C&I Deep Energy Retrofit Offering 3
- Defining Deep Energy Retrofit 4
 - Required Upgrades 4
 - Customer and Building Eligibility 4
 - Early Indicators for DER Feasibility 5
- Participant Benefits..... 7
 - Overview of DER Benefits 7
 - Deep Energy Retrofit Offering and the Energy Efficiency Programs 9
 - Public Recognition 9
- Measuring Deep Energy Retrofit Achievement 10
 - Establishing Progress and Achievement 10
- Deep Energy Retrofit Technical Support and Deliverables 11
 - Technical Assistance Vendors 11
 - Comprehensive Site Energy Assessment and Scoping Study..... 11
 - Detailed Technical Assessment Study..... 12
 - DER Roadmap..... 12
- Commissioning Deep Energy Retrofit Projects 14
 - DER Commissioning Triggers..... 15
 - Commissioning Process..... 15
- Deep Energy Retrofit Process 16
 - Roles and Responsibilities..... 16
 - General Process 17
 - Phase I: Preliminary Interest and Screening 18
 - Phase II: Feasibility Assessment..... 18
 - Phase III: Detailed Assessment 19
 - Phase IV: Deep Energy Retrofit Term 20
 - Phase V: DER Qualification..... 21

Introduction to the C&I Deep Energy Retrofit Offering

The Mass Save Sponsors (Sponsors) have developed a Deep Energy Retrofit (DER) offering that operates as a complimentary layer on top of our existing energy efficiency programs, providing participating customers with technical assistance, planning support, and additional payments to help them meet their climate and energy goals. Participants who reach their DER targets will receive \$1/sqft in addition to standard program incentives. After a planning period, participants will have a total of three years to implement identified DER measures. Along with the DER payments and standard program incentive support, the DER offering will provide building energy insights, electrification guidance, and a clear roadmap to substantial energy and GHG emission reductions.

This guidebook is intended to provide any interested party with a detailed overview of the Deep Energy Retrofit offering requirements, benefits, and participation process.



Deep Energy Retrofit Offering Target Outcomes

Defining Deep Energy Retrofit

The Massachusetts C&I DER offering defines a “deep energy retrofit” as a combination of electrification and energy efficiency improvements that reduce a specific building’s¹ annual greenhouse gas (GHG) emissions by at least 40% relative to existing building conditions². To qualify as a DER building, all upgrades must occur within a three-year DER term, which will begin after the DER planning process is complete. The MA DER offering considers GHG emissions related to energy consumption at the facility, which excludes consideration of on-site renewables like solar photovoltaics as well as other GHG sources like refrigerant emissions.

Required Upgrades

All participating buildings must include the following upgrades, as well as any additional energy efficiency upgrades required to meet the 40% GHG emission reduction target:

- Full or partial electrification of space conditioning. For most buildings this will include displacing gas, oil, or propane space heating equipment with heat pumps. Customers may have additional opportunities for electrification of process and hot water loads, but must include electrification of space heating to qualify for DER.
- Building shell or ventilation improvements. Building shell improvements may include adding insulation to walls or roofs, air sealing, duct sealing, window replacement, etc. Ventilation improvements may include upgrades to mechanical ventilation systems, for example installation of dedicated outdoor air systems (DOAS) with heat recovery, or improved ventilation control, for example implementation of demand control ventilation.

Customer and Building Eligibility

The DER offering is open to all customers with a commercial meter, however there are some restrictions to participation for specific sites.

- Customers must have strong motivation and a feasible path towards significantly reducing building energy consumption and the site GHG gas emissions
- Buildings served by a Municipal Light Plant are not eligible
- Buildings must be occupied for at least one year prior to the start of the DER engagement.³
- Buildings with planned changes in space use (i.e. converting from lab space to office space) are not eligible
- Buildings participating in the Major Renovations (MR) pathway are not eligible. The MR pathway will provide the customer with similar technical support and enhanced incentives, which is redundant to the support provided by DER.⁴

¹ The DER offering qualifies individual buildings, not portfolios or campuses. Customers may bring multiple buildings for participation in the DER offering, but each building must qualify independently.

² DER qualified emission reductions will be derived during a required Detailed Technical Assistance Study. DER savings will be estimated relative to the existing building consumption, similar to what a customer will see saved on their energy bills. The energy savings considered for the DER offering may differ from the energy savings that the Sponsors of Mass Save consider for incentives in the energy efficiency programs, which must follow regulatory and evaluation standards.

³ The start of the DER engagement will be considered the site energy assessment date.

⁴ <https://masssave.com/cincmr>

- Buildings that qualify as Income Eligible Multifamily facilities are not eligible. These facilities should be served through the residential Income Eligible programs. The Income Eligible programs offer similar technical support and enhanced incentives for qualifying projects.⁵

Buildings that are not eligible for the C&I DER offering may still benefit from participation in the standard energy efficiency and electrification programs. Interested customers should reach out to their Mass Save Sponsors for more information.

Early Indicators for DER Feasibility

Not all buildings will have a clear path to DER qualification given competing customer priorities, budget limitations, and technical constraints of the building. The more efficient an existing building is, the more difficult it may be to find opportunities for an incremental 40% GHG reduction on site. Customers should also be aware that some facilities may require electric upgrades to meet the technical requirements of heat pump installations.

While all interested customers are encouraged to consider the DER offering, certain indicators may give customers early insights into the feasibility of DER upgrades in their building. Buildings are more likely to have a feasible path towards DER if:

- **Older building vintage:** Older buildings (built before 1990) may have higher potential for energy reduction from improved building shell and ventilation upgrades.
- **Oil and propane use:** Using oil and propane in a building will produce more GHG emissions than use of electric or gas. Buildings that use oil and propane are likely to have higher GHG emission reduction potential compared to similar buildings using gas or electricity.
- **Limited past energy efficiency upgrades:** Buildings that have recently implemented energy efficiency upgrades may have more difficulty in finding an additional 40% GHG emission reduction. Buildings that have never undergone an energy assessment or efficiency upgrades may be more likely to find significant areas of improvement.
- **Non-LED lighting:** Converting lighting to LEDs can be a significant source of energy savings at relatively low cost.
- **Excessive energy bills:** Buildings with very high energy bills compared to similar buildings may have more opportunity for energy and GHG emission reductions.
- **Existing major equipment near end of life:** Older major equipment, like boilers or water heaters, may be towards the end of their useful life and tend to have lower efficiencies than newer equipment. If a building is served by old, inefficient equipment, there may be both a financial opportunity for a capital replacement and a GHG emission reduction opportunity for installing more efficient equipment.
- **Easier to convert HVAC distribution systems:** Some HVAC systems will be more difficult to electrify than others. For example, a building with an existing ducted distribution within the building may be easier to convert to air source heat pumps compared to a building with hydronic heat.

Certain conditions may make DER achievement more challenging:

- **Insufficient electric capacity:** Heat pump installations may require electrical upgrades to the building to ensure sufficient power to the heat pump units. Electrical upgrades will be considered during the DER planning process.

⁵ <https://leanmultifamily.org/>

- **Recent major system replacements:** Buildings that have replaced HVAC or hot water system within the last 5 years may be less likely to replace their relatively new equipment.
- **Limited personnel bandwidth:** DER projects will greatly benefit from engaged, active project champions.

Participant Benefits

DER is designed to emphasize technical support for customers meeting aggressive site energy savings and climate goals. The offering will help customers plan projects and verify the systems are designed and operate with the lowest site energy consumption possible.

Customers with a feasible path towards DER achievement will receive:

- No cost, comprehensive site energy assessment
- No cost building scoping study
- Minimum 50% PA co-pay of detailed technical assessment study
- DER Roadmap to specify pathway to DER qualification
- Up to \$20,000 towards required third party commissioning fees

Customers who participate and achieve DER goals within the DER term will receive:

- Milestone DER payment of \$0.40/sqft upon achievement of 25% GHG emission reduction
- DER Achievement payment of an additional \$0.60/sqft upon achievement of 40% GHG emission reduction
- Public recognition

Customers who begin the DER process, but are unable to reach their DER targets within the three year term, will keep any participation benefit they receive.

Overview of DER Benefits

	Financial Benefits	Other Benefits
Comprehensive site energy assessment and scoping study	The Sponsors will cover 100% of the energy assessment and scoping study costs. Scoping study value is expected to be between \$5,000-\$10,000 depending on the building size and system complexity.	<p>The scoping study will provide rough estimates of costs and savings for all identified measures to help the customer understand the scope of the work needed to meet their DER target. The customer will receive consulting on which electrification options are best for their building considering the building lay out, existing HVAC systems, heating load, and building electrical capacity. The scoping study will be provided to the customer even if they do not continue as a DER participant.</p> <p>During the assessment and scoping process, the Sponsors will also help the customer understand their overall building energy consumption through Energy Star Portfolio Manager (ESPM) or another similar tool. ESPM findings and performance will not affect DER payments.</p>

Detailed Technical Assistance (TA) Study	The Sponsors will cover at least 50% of the TA study costs. ⁶ Detailed TA study total cost is expected to be between \$30,000-\$40,000 depending on the building size and system complexity.	The TA study will provide rigorous energy and GHG estimates that will be used to qualify the building as DER. Customers may keep the TA study even if they do not continue as a DER participant.
DER Roadmap	The Sponsors will develop a customer DER Roadmap in partnership with the TA vendor and customer at no cost to the customer.	The DER Roadmap will provide the customer a plan to reach their GHG targets. The plan will include roles and responsibilities for the project, scopes for each planned upgrade, verification or commissioning requirements for each installation, expected timeline of completion, expected DER payment schedule, and other relevant project planning details.
Energy Efficiency Incentives (independent of DER offering)	Sponsors will support the installation of program qualified, cost-effective energy efficiency and electrification measures through the standard program offers. DER will not provide additional incentives at the time of measure installation. Customers must apply for program incentives and meet standard program requirements to receive incentives.	
Commissioning	The Sponsors will provide up to \$20,000 for DER required third party commissioning fees incurred during the DER term. Payment will be available as required commissioning work is complete. Commissioning will be required for all projects that involve partial electrification of space heating and projects with a significant control component.	Commissioning is often overlooked, but can be crucial to realizing the energy and emission benefits of installed equipment. Involvement of a commissioning agent in both reviewing the final project design and implementation is the best way to ensure the installation realizes the expected energy and GHG reductions.
DER Check Points		The Sponsor representative and customer will meet to discuss DER progress on at least a bi-annual basis. The discussions will be used to problem solve barriers, answer questions, adjust the plan if necessary, and discuss

⁶ The DER offering guarantees at least a 50% co-pay for all DER detailed TA studies. The EE programs may provide additional funds in some cases. Talk to your Mass Save Sponsor about what support is available for your project.

		whether the project has met criteria for a DER payment.
Milestone DER Payment	The Sponsors will provide \$0.40/sqft upon achievement of 25% GHG emission reduction.⁷	The customer will receive some marketing materials to share their project success.
DER Achievement Payment	The Sponsors will provide \$0.60/sqft upon achievement of 40% GHG emission reduction.	The Sponsors will celebrate reaching DER status with public recognition.

Deep Energy Retrofit Offering and the Energy Efficiency Programs

A core mission of the existing energy efficiency programs is to support customers as they install cost-effective building upgrades through a range of programs and participation pathways. The DER offering will not replace the existing programs, which are already well positioned and suited to support the installation of many DER identified measures. Instead, the DER offering will support the customer as they identify, specify, and plan their building upgrades. Customers may still access standard program incentives as they install equipment.

All energy efficiency incentives are subject to program rules and requirements. Some identified upgrades may not be eligible for energy efficiency incentives under program policies and regulatory requirements. The Sponsors will help the customer understand and navigate the energy efficiency and DER requirements and processes.

Public Recognition

Buildings that qualify as Deep Energy Retrofit projects have achieved an exciting and significant step towards more sustainable and climate friendly operation. The Sponsors will publicly celebrate this achievement with participants to highlight their success with the broader community.

⁷ Achievement of GHG reduction will be based on verified installation of identified measures specified in the DER Roadmap. Reduction estimates will be taken from the detailed TA study. Installations may be completed in any order.

Measuring Deep Energy Retrofit Achievement

The Deep Energy Retrofit offering has a milestone-based achievement structure based on progression through the DER Roadmap plan. Customers can anticipate early in the process what action is required to meet DER achievement and have confidence in program support as long as the DER Roadmap is followed. The Sponsors will support the use of building performance analysis, like Energy Star Portfolio Manager, to help the customer understand the actual change in building consumption over time, but will qualify and reward DER achievement based on the milestones established in the DER Roadmap.

Defining Eligible Building Area

The C&I DER offering will consider building areas that are comfort conditioned spaces. Parking garages and mechanical penthouses are not included in the DER building area.

Establishing Progress and Achievement

The C&I DER offering will define GHG emission reductions based on the detailed TA Study. The DER Roadmap will outline the expected order of measure installation and the corresponding cumulative GHG reduction after each verified installation. The detailed TA study will provide the basis for DER achievement milestones.

During the bi-annual DER Check Point meetings, the customer and Sponsor representative will discuss progress in measure installation and verification. As verified installations are completed, the customer will be credited with the corresponding GHG emission reductions established in the TA study.

There may be some limited cases where measure installations deviate from the DER Roadmap. Each deviation will be considered on a case-by-case basis, but could result in changes to DER achievement.

- **If an installation differs significantly from the DER Roadmap expectations**, it is possible that the customer will not receive credit toward DER achievement or that the credit will be adjusted for that measure. Significant changes may be identified by a Sponsor engineering review of the “as built” project documentation, findings from the installation verification, or findings from the commissioning agent. If the final installation results in lower GHG emission reductions than expected and there is an opportunity for corrective action, the Sponsors will credit the GHG emissions after the issues are resolved.
- **If a measure is not installed** it will not be credited towards DER achievement.
- **If a new measure is identified after the TA study is complete** the customer should reach out to the Sponsors for guidance on if and how it can be credited towards their DER goals. Analysis of new measures may incur additional TA study costs.
- **If a measure is not installed and verified during the DER term**, the customer will still benefit from the planning process, project verification, and EE incentives, but will not qualify as achieving their DER target. Measures that are installed after the DER term may be eligible for standard program incentives, but will not qualify the customer for further DER payments or commissioning payments incurred outside of the DER term. Customers are encouraged to reach out to their Sponsor when they are facing installation delays.

Deep Energy Retrofit Technical Support and Deliverables

Participants will receive deliverables that provide valuable insights into their existing building operation and how they can upgrade the building to reduce their energy consumption and GHG emissions. Customers may keep each deliverable even if they do not commit to the DER process or do not meet their DER milestones.

Technical Assistance Vendors

Customers *must* work with a qualified, DER approved technical assistance (TA) vendor, who will stay engaged with the project throughout the DER planning process at a minimum. The Sponsors will work with a closed list of vendors in this role, each of which has been trained in the program requirements, has experience in the MA energy efficiency program, and has comprehensive technical qualifications. Customers may inquire with their Sponsor contact for the most current list of qualified TA vendors.

Comprehensive Site Energy Assessment and Scoping Study

The chosen TA vendor will work with customers to identify all GHG reduction opportunities at the facility and determine the preferred electrification approach. The scoping study will provide rough estimates of savings for each upgrade identified in the energy assessment. The scoping study will not confirm final DER potential for the facility, but should provide approximate savings and cost for DER qualification. The energy assessment and Scoping Study will be completed by a qualified DER TA vendor.

Overview of deliverable:

- The energy assessment and scoping study will be provided to the customer at zero cost. Customers may keep the study even if they do not continue down the DER path.
- Site energy assessment will produce a comprehensive list of possible upgrades for the facility.
- The scoping study will provide preliminary site energy savings and cost estimates. The preliminary estimates are expected to change from the scoping study to the more detailed TA study described in the next section.
- The scoping study will be used to discuss potential electrification options for the customer, such as full vs. partial fossil fuel displacement and various heat pump technologies.
- The scoping study will specify if the customer will be responsible for providing more specific system design documents prior to the start of the TA study. This information will be required to estimate the GHG savings for the project. System design information may include more detail on the technology, size, or sequences of operation. The information does not need to be final, but should be sufficient for the TA vendor to produce required energy models. This is likely to be required for particularly complicated projects, as with geothermal systems.
- The scoping study will investigate building electrical upgrades required for planned heat pump installation.
- The TA vendor will work with the customer to populate Energy Star Portfolio Manager (ESPM) to provide insights into their building's energy consumption over time.
- The scoping study and ESPM estimates of building consumption will not establish the building emission baseline. The final DER baseline emissions will be established in the TA study as part of the detailed analysis.
- The scoping study will determine the final building square footage value to be used for the DER payment calculation.

Requirements from customer:

- The identified building must have a feasible path towards DER eligibility. Customers should be prepared to make upgrades to most major systems in the building within a relatively short period of time, likely including lighting, HVAC, hot water, envelope, and building controls.
- Customers must be available to provide the TA vendor team with access to both physical spaces at the facility and data access, including billing data and data from existing building management systems.
- A person familiar with the operation of the facility must be available to walk the TA vendor team through the facility, answer questions, and provide requested data.
- Depending on the size and complexity of the facility, the energy assessment may take between 1-3 days.

Detailed Technical Assessment Study

Once a possible path to 40% reduction in GHG emissions is identified based on preliminary scoping study estimates, a detailed Technical Assessment (TA) study will determine final energy and GHG estimates for each measure identified. The TA study will model the impacts of the electrification strategy decided on by the customer. If specified in the scoping study customers may be required to obtain a system design (including information like the technology that will be used, the size of the system, sequences of operation, etc.) before the TA study can be completed. Any required information will be specified in the Scoping Study. The TA study GHG estimates may be greater or less than the scoping study estimates, which may change the understanding of how feasible DER will be for the customer. The same vendor will complete the energy assessment, scoping study, and TA study.

Overview of deliverable:

- The TA study will provide site energy savings estimates from the existing building (for purposes of DER qualification) as well as estimates using standard program baselines (for purposes of quantifying energy efficiency program savings).
- The study will consider and recommend savings verification requirements for all proposed measures. The savings verification plan may be more detailed than typical program post inspections and may specify a third-party commissioning agent.
- The TA study GHG estimates will establish the building and measure GHG emission baseline and reduction that will be used to qualify the customer's progress towards their DER goals.
- The TA vendor will provide a summary of the planned measures and savings that will be used to track DER progress if the customer proceeds through the DER process.

Requirements from customer:

- Most customers will be required to cover 50% of the study cost. Cost of the study may vary depending on the size and complexity of the project, but typically run between \$30,000-\$40,000 total.
- Customers should provide the TA vendor team any additional information required for their modeling and analysis, which may include system designs for complicated projects.

DER Roadmap

The Sponsor representative(s), customer, and potentially the TA vendor will review the TA study to understand the feasibility of meeting the DER criteria in the building. If a feasible path exists, the Sponsor representative will work with the customer to develop a DER Roadmap, which will lay out the expectations, details, and requirements for the customer to achieve their DER goals. The DER Roadmap will also serve as an MOU between the customer and the Sponsor(s) for the DER project as a whole.

Buildings that do not have a feasible path to DER qualification may still find value in the TA study as a roadmap to improve their facility.

Overview of deliverable:

- The DER Roadmap will outline the DER goals and vision, roles and responsibilities, measures and associated GHG emission reductions, verification requirements, and an expected schedule of DER payments.
- The DER Roadmap will clearly specify when a third-party commissioning agent will be required for DER achievement and what their scope of work will entail.
- The DER Roadmap should identify any planned measures that are not eligible for energy efficiency incentives. Installations that are not eligible for program incentives should have additional planning to clarify verification requirements and responsibilities.
- The DER Roadmap will specify the DER payment and commissioning fee allocation between all involved Sponsors.

Requirements from customer:

- Both program Sponsors and the customer will sign the DER Roadmap to signify understanding of the DER requirements, commitment to the process, and the start of the DER term.

Commissioning Deep Energy Retrofit Projects

A key feature of the DER offering is supporting third party commissioning for certain measures, especially when system control is a key component of realizing both energy savings and GHG emission reductions. Commissioning often verifies that systems meeting comfort requirements are also meeting energy and emission requirements. Commissioning requirements may be identified as early as the scoping study, but will be documented and required based on the final detailed TA study and DER Roadmap.

For example, the biggest driver of GHG emission reductions for heat pump installations with a back up fossil fuel heating system is not the heat pump heating efficiency, but how often the fossil fuel system is running. The occupants of the space will be similarly comfortable if either the heat pump or the fossil fuel system is on, but there will be no GHG emission reduction for the facility if the fossil fuel system serves the entire heating load. This outcome can be avoided by careful end-to-end management of projects to ensure the intent of the TA study is incorporated into the final project design and verified in the installed system operation.

Commissioning agents are most effective when they are engaged as early as the project design and through measure implementation. The objective of the commissioning process is to maintain continuity of design intent throughout the entire DER process. The DER offering highlights two periods of project development and implementation that are prone to changes from original TA study specifications.

	Description and Potential Issue	DER Mitigation Approach
Finalizing Project Specifications and Design	During this phase of the project, the TA study specifications are translated into requests for proposals to solicit contractor bids. The selected contractor will bring their own expertise to finalize the system design and specify equipment. It is possible for minimum requirements from the TA study to be missed, removed, or changed by the customer or the contractor as they work through finalizing the project.	The DER offering will provide input to the customer procurement process: <ul style="list-style-type: none"> • The TA vendor will assist the customer in ensuring the request for proposals reflects the TA study intent • The third-party commissioning agent will assist the customer in reviewing bids and final design plans to ensure the design reflects the TA study intent
Installation and Operation	Some installations may differ from the contractor's final design either because the work was not fully completed, was not commissioned, or was overridden by the building operator.	The Sponsors will require and support commissioning of certain installations by a third-party commissioning agent. The commissioning agent will stay engaged with the project through installation and then verify the final system operation.

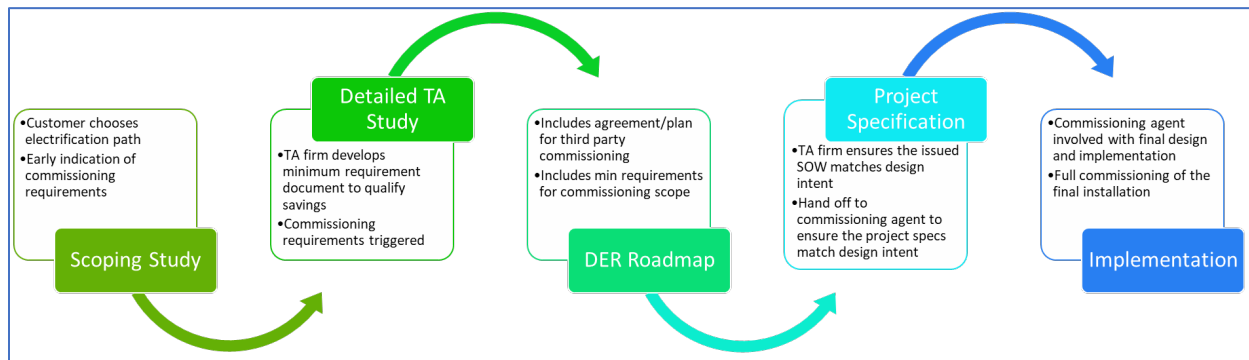
DER Commissioning Triggers

Thus, the DER offering requires a third-party commissioning agent for projects that meet at least one of the two following scenarios:

- **Two HVAC systems serve the same space and heating load.** This would include partial electrification of space heating, where realizing GHG targets is at risk if the heat pump is not providing expected heating. The commissioning agent will ensure proper coordination between the heat pump and back-up heating systems to maximize GHG savings while maintaining occupant comfort.
- **Significant GHG reductions expected from system control.** This may include retro-commissioning of an existing building management system (BMS), installation of new BMS, or other control related improvements. The commissioning agent will verify the control sequences of operation are fully functional for all seasons and expected operating conditions.

Commissioning Process

The DER commissioning process is an end-to-end component of DER participation and involves both the TA vendor and the commissioning agent. The commissioning requirement for the project can be identified as early as the scoping study, but the commissioning agent will not be selected and begin their engagement with the project until after the DER Roadmap is complete.



Overview of Commissioning Considerations throughout DER Participation

Deep Energy Retrofit Process

A Deep Energy Retrofit project is a time and resource intensive investment occurring over multiple years. The goal of the DER offering is to follow a practical and staged approach of project planning and execution.

Roles and Responsibilities

A Deep Energy Retrofit project requires ongoing engagement from customers, Sponsors, engineering firms, commissioning agents, and various contractors. Each DER Roadmap will address roles and responsibilities for each DER project, but generally responsibilities will be as follows.

- **DER Participating Customer:** Participating customers should be motivated to achieve significant energy and GHG emission reductions in their facilities. DER upgrades are likely to touch most or all major systems within the participating building. They should understand and participate in all DER requirements to ensure a successful project. The customer responsibilities will include:
 - Identification of potential DER buildings and a project champion
 - Provide access and support to TA vendor during site energy assessment, scoping study, and TA study. The customer will be asked to provide billing data, available building and system drawings, system trend data, and physical access to the facility.
 - In some cases, the scoping study may specify that the design is required prior to the TA study.
 - Co-pay for detailed TA study
 - Work with Sponsor Representative to develop DER Roadmap
 - Contract with commissioning agent and provide documentation to the Sponsor for reimbursement of commissioning costs
 - Include TA vendor and commissioning agent in contractor selection and project specification finalization as required
 - Customer is responsible for contracting with vendors for all system design and equipment installations
 - Customer is responsible for submitting applications for energy efficiency incentives and complying with program policies and requirements to receive program incentives.
 - Customers will meet with their Sponsor representative regularly during the planning phase and at least twice a year during DER Term.
- **Sponsor Representative(s):** Each DER participant will have a main point of contact from their electric Sponsor. The representative will likely be a sales team member with an existing customer relationship. The Sponsor representative will coordinate as necessary with other involved Sponsor representatives on the following tasks:
 - Initial discussion of DER offering and opportunities with customer
 - Screen potential DER buildings with the customer for feasibility of 40% GHG emission reduction
 - Facilitate selection of TA vendor
 - Initial population of customer information into DER Tracker⁸
 - Work with customer to develop DER Roadmap
 - Schedule and manage bi-annual DER Check Point meetings
 - Update and maintain DER Tracker as needed

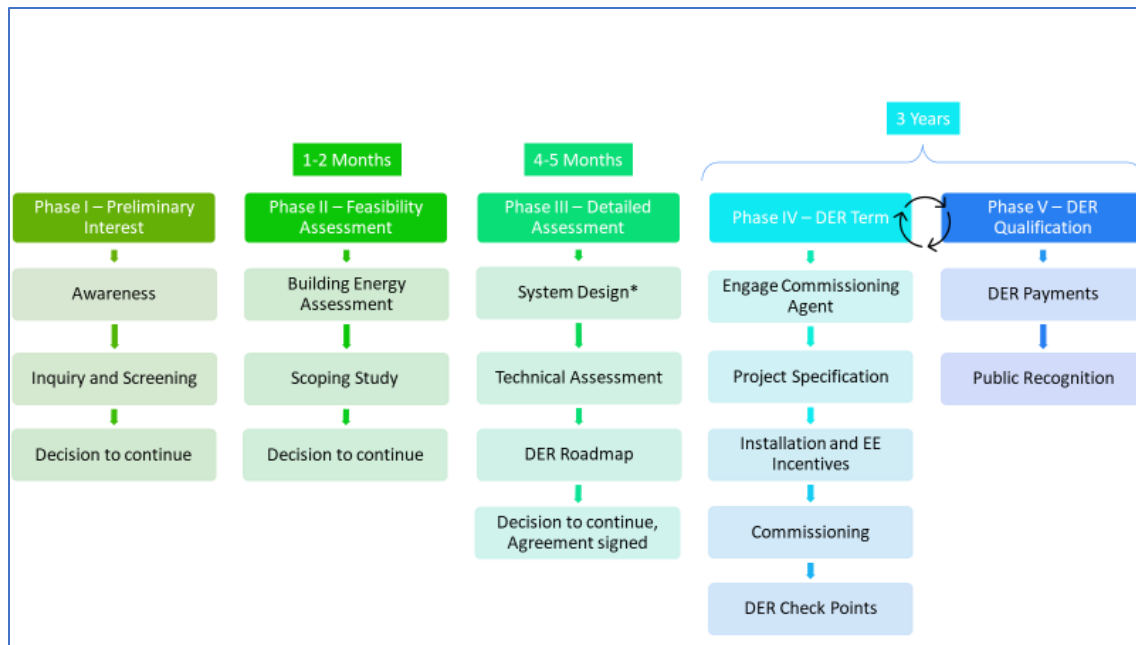
⁸ The DER Tracker is an internal tool the Sponsors will use to track progress of DER participants

- **DER TA Vendor:** The TA vendor will provide technical expertise, consulting, and analysis to support the DER process.
 - Comprehensive energy assessment at facility
 - Complete the scoping study and TA study
 - Potential additional investigation into building electric capacity and upgrades required for electrification
 - Assist customer and Sponsor in understanding technical challenges and options for DER qualification
 - Detailed Minimum Required Document (MRD) for each planned improvement outlining how installations will be qualified towards DER.
 - For measures requiring commissioning, the TA vendor will assist customer with bid documents to ensure TA study requirements and intent are included in bid documents
 - Facilitates hand off of bid document review to commission agent as needed
- **Commissioning Agent:** The commissioning agent will provide some oversight during the DER implementation phase to ensure that the project is implemented in line with DER expectations.
 - When required in the DER Roadmap, the commissioning agent will assist customer in reviewing bid documents from potential contractors as well as final contractor designs to ensure TA study requirements and intent are included in the final project design
 - The commissioning agent may have an ongoing engagement during implementation and after measure installation to ensure the system is operating as intended

General Process

The DER participation process is organized into five major phases. Phases I to III are oriented around testing DER feasibility and planning a pathway to DER qualification. Each stage requires incrementally more commitment from the customer and the energy efficiency programs as well as an “off ramp” to exit the DER process. The project may exit the DER process at the request of the customer or of the program. Phases I to III are expected to take at least 6 months to complete.

Phases IV and V are oriented around implementing the DER Roadmap. Customers will be responsible for measure installations, with the programs supporting their efforts with standard energy efficiency incentives and regular DER Check Point meetings. DER payments will be issued to support commissioning (Cx) and reward DER progress as appropriate throughout the DER term.



Deep Energy Retrofit Process Overview

Phase I: Preliminary Interest and Screening

During Phase I, customers will be educated on DER benefits and requirements. Buildings should only proceed to Phase II if the customer and Sponsors agree that a specific building has a possible path towards DER.

1. **Awareness** - Customer learns about DER offer from a Sponsor representative, the Mass Save website, or other marketing/communication material.
2. **Inquiry and Screening** - Customer should contact their electric Sponsor for more information about DER. The electric Sponsor will serve as the main point of contact for the customer and take lead on DER coordination. The Sponsor representative will discuss program requirements and expectations with customers. Customers should be prepared to discuss:
 - a. Customer upgrade goals and motivation
 - b. Past EE upgrade, areas of potential improvements (electrification, weatherization, any other significant loads that can or cannot be addressed)
 - c. Monetary and technical benefits of the DER offer
 - d. Any past audits, building EUI information, etc. that would provide insight into current building performance and potential savings
3. **Decision Point #1** – After the initial discussion, the customer and Sponsor should determine if they would like to progress to the DER energy assessment and scoping study.
 - a. Select specific building(s) of interest
 - b. Sponsor representative should inform other relevant Sponsors of customer interest and enter their basic information in the DER Tracker⁹.

Phase II: Feasibility Assessment

During Phase II, the DER opportunity for the building will be scoped. The scoping study is a planning tool for the customer to understand the cost, effort, and benefits of a DER level building upgrade. Customers are not required to contribute funds towards the project in Phase II, but are required to

⁹ The DER Tracker is an internal tool to track progress of DER participants

provide time and data to support the energy assessment and scoping study. Buildings should only proceed to Phase III if the customer and PA agree that the building has a technical and financial path to DER.

4. **Building energy assessment** – Customer and Sponsor representative will select a TA vendor from the approved vendor list. The TA vendor will perform a comprehensive on-site energy assessment to identify all emission reduction opportunities at the facility. Customer should allow at least a full day for the comprehensive site assessment, although some assessments may take multiple days. Someone familiar with the operation of the building must be available to answer vendor questions and provide access to the building, systems, and relevant operational data.
 - a. Customers who have prior and recent work performed with a different vendor, such as a town wide investment audit or a Mass Save audit of an individual building, should provide available information with the TA vendor. Depending on how robust the existing work is, the TA vendor may forgo additional on-site work, or limit the work to fill in required information.
5. **Scoping study** – The scoping study will consider the identified GHG reduction measures and provide rough, preliminary estimates of energy savings, GHG reductions, costs for each identified measure, and any building electrical upgrades required for electrification. The scoping study may also identify certain measures that require system design prior to the TA vendor performing the detailed assessment. Customers will be responsible for obtaining system design before the TA study will begin in the following phase. Customers should expect the scoping study about 3 weeks after the energy assessment is complete.
6. **Decision Point #2** – The customer, TA vendor, and Sponsor(s) representative will discuss the feasibility and effort to meet DER criteria based on the scoping study results. Customers must decide what electrification strategy they will implement as part of their DER effort. All scoping study estimates are subject to change in the final detailed technical assessment study. It's possible the scoping study indicates a path towards DER qualification, but the technical assessment does not. Customers and program staff should consider the risk that continuing down the DER pathway may not result in the building meeting the DER requirements. The discussion should consider:
 - a. Risk of the building not meeting DER requirements based on the more rigorous TA study
 - b. Magnitude of cost and benefits of DER compared to lower levels of upgrades outside of DER
 - c. Possible sources of external funding, including program incentives, available tax benefits, and any grants for which the building may be eligible
 - d. Feasibility of completing DER upgrades in a three-year period
 - e. Appropriate electrification strategy with consideration of electrical upgrades required

Phase III: Detailed Assessment

Phase III defines the final DER scope and DER roadmap that will establish the criteria for DER qualification. Customers are expected to contribute towards the detailed TA study (50% co-pay as default). Phase III is the final decision point before the DER term begins. Buildings may only proceed to Phase IV if the customer and Sponsor agree to and sign off on the DER Roadmap.

7. ***System Design** – Prior to the TA vendor beginning the Detailed Assessment, customers may be responsible for obtaining system designs for complex installations, such as geothermal systems. These designs are required before a detailed energy analysis can be completed. Measures requiring system design will be identified and specified during the scoping study.

8. Detailed Technical Assessment – The TA vendor will complete a detailed analysis of the identified GHG reduction opportunities for the facility. The TA study will provide GHG and energy estimates relative to the existing building conditions for the purpose of DER achievement, as well as relative to the appropriate baseline to consider in the energy efficiency programs. Customers should anticipate about 3 months for the detailed study.
9. DER Roadmap– The customer, Sponsor, and TA vendor will discuss the final scope and plan for meeting the DER criteria. The DER Roadmap will specify measures to be installed, verification and commissioning requirements, timing of measure installations, and energy efficiency program pathways available to support measure installations. The DER Roadmap will also serve as the MOU document that all parties sign off on (customer and both Sponsors).
10. Decision Point #3 – At this point in the process the customer will have the full detail of what is required for them to qualify for DER, approximate installation costs, and the benefits of DER participation. Customers with a pathway to DER qualification must decide if they are going to pursue the DER pathway.
 - a. Customer signature on the DER Roadmap will signify agreement to the DER requirements.
 - b. Both Sponsors will agree to and sign the DER Roadmap
 - c. When the customer commits to the DER Roadmap the three-year DER term begins.

Phase IV: Deep Energy Retrofit Term

The DER term process described here may be iterative depending on the planned measures for the project. For example, the customer may not need to engage contractors for all planned upgrades in year 1.

11. Engage Commissioning Firm – When required in the DER Roadmap, the Sponsors ask that customers select a third-party commissioning agent early in the DER term to ensure the full scope and intent of the detailed TA study is met through the project. The commissioning agent should be brought in early enough to contribute to the contractor selection and final project design.
12. Project Specification – For measures that require commissioning, the TA vendor and commissioning agent will assist the customer in ensuring that the original TA study intent is met in the final project design. TA vendors will not provide oversight for measures that do not require commissioning.
 - a. Develop SOW– the customer will be responsible for selecting and contracting with their installation contractor, however, the TA firm will assist in developing RFPs to ensure customers are asking for proposals that reflect the DER requirements.
 - b. Contractor selection – the commissioning agent is expected to help the customer review bids to ensure the accepted bids reflect the intent of the TA study requirements.
13. Installation and EE Incentives – Customers should install measures throughout the DER term in accordance with their DER Roadmap. Customers may be eligible for energy efficiency incentives for many of their measures. Customers are responsible for submitting applications for energy efficiency incentives and complying with standard program processes and requirements. Customers should be aware that additional verification steps may be required to qualify the installation for DER even after program incentives have been paid.
 - a. The Sponsors will provide standard program incentives to customers for eligible installations through the appropriate program pathways.

- b. It is possible some measures identified in the DER Roadmap will not be eligible for program incentives. Verification requirements for non-program eligible measures will be specified in the DER Roadmap.
- 14. Commissioning – As specified by the DER Roadmap, some installations will be subject to verification and commissioning review to ensure a high-quality installation.
- 15. DER Check Point Meetings – On a bi-annual basis, the Sponsor representative and customer will meet to discuss progress towards the DER goal.
 - a. Discuss completed, in progress, and planned upgrades to determine if the customer is still on track for their DER goals. If not, discuss action to get back on track.
 - b. Barriers or changes to planned upgrades
 - c. Verify if the customer has qualified for the Milestone DER Payment by achieving 25% GHG reduction or the final 40% GHG reduction target.

Phase V: DER Qualification

Customers will receive DER payments and public recognition to celebrate reaching their GHG targets. Achievement will be qualified as installations are installed and verified in line with the DER Roadmap, which may occur at any point in the three-year DER term.

- 16. DER Payments - As the customer completes and verifies measure installation they will make progress towards their DER goals. DER Payments will be available at 25% and 40% GHG emission reductions, whenever those milestones reached within the DER term.
 - a. Customers should expect each Sponsor to contribute towards each DER Payment and may receive two separate checks.
- 17. Public Recognition – when the customer reaches their 40% GHG reduction target the Sponsors will celebrate their effort and progress with publicity.