Memo to:
Massachusetts Program Administrators, Energy Efficiency Advisory Council Consultants

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GROSS IMPACT FRAMEWORK – DECISION GUIDE (UPDATE)

This memo summarizes decisions related to key processes and issues that the PAs, the EEAC Consultants, and the DNV GL team have addressed since the publication of the previous Gross Impact Framework – Decision Guide Memo in March 2020, following the implementation of the Gross Impact Evaluation Framework adopted in February 2017. For ease of review, we are presenting these latest decisions in this standalone memo. Once the PAs and EEAC Consultants have reviewed and signed off on the content of this memo, we will create a consolidated memo covering recent and historical decisions – creating the next iteration in a living document that will continue to be updated with EM&V decisions made in consultation with the PAs and EEAC Consultants. For reference, the prior memo is included as an attachment to this document (P76 Impact Transition Decision Guide Memo FINAL 03182020).

The table below summarizes topics and key decisions and internal cross-references to sections of this memo with more detail.

Table 1. Summary of topics addressed and key decisions

Topic	Key Decision
Limit on Projects per Site for Evaluation	Include an analysis of the number of applications per site as part of all custom evaluation scoping discussions, and flag any sites with more than four applications for discussion with the group.
Subcategorization of Operational Differences	Subdivide the high-level discrepancy categories, including operational differences, into subcategories as is practical. Subcategories should be consistent but are not intended to be rigid and fixed. Discrepancies should be presented using the "allocation" method rather than the "cascade" method.
Baseline for ROF projects that involve a change in technology	These types of projects will be classified as lost opportunity and consequently the baseline cannot be the pre-existing system. Baseline should be classified as unique; the unique baseline is ISP efficiency of the pre-existing system. The incremental cost should be included in the CST tool the project should meet program criteria.
Custom Express Tool Adoption	Develop a process for custom express tool adoption. New tools should start to be used as soon as they are ready, with clear documentation of which tools are used when.

Topic	Key Decision
Lifetime Savings and Measure Life	This is being addressed in the MA20C08-B-LIFE Lifetime Impact/Baseline Study. Population of this topic will be filled in pending study results.
Ex-Ante Review Process	All information is stored in one central repository. Depending on the level of activity, EEAC Consultants may review a sample of projects vs. a census.
Special considerations of statewide results and prospective evaluation results	For Custom Electric and Gas evaluations, evaluators will attempt to identify frequent measure or projects that are repeated in the sample and provide a list to the small PAs for review. The onus will be on the small PAs to raise issues of misalignment in samples early in the evaluation. Specific handling of issues that are identified will continue to be handled on an ad hoc basis.

1 DETAILED TOPICS

This section presents additional detail on each of the key decision presented above. Where possible, we also reference the publicly available report (or other documentation) of the decision. We have also included placeholders for topics which have been identified but not yet discussed.

1.1 Limit on Projects per Site for Evaluation

During the course of planning the 2018/2019 Custom Electric evaluation, a question regarding potentially capping the number of applications included in a single evaluation was raised. This stemmed from concern that evaluating five or more applications may be too burdensome for the customer.

After discussion with the PAs and EEAC Consultants, it was decided to include an analysis of the number of applications per site as part of all custom evaluation scoping discussions, flagging any sites with more than four applications for discussion with the group. The PAs, EEAC Consultants, and evaluators can discuss these sites and weigh the pros and cons of how to proceed.

Historically, when a customer site is selected for inclusion in either the custom electric or custom gas impact evaluations, we have tried to capture all applications (projects) completed in the program year in a single evaluation. For some customers, this has meant evaluating five or more applications, and the PAs have expressed some concern that this may be too burdensome for the customer as well as costly and burdensome for evaluators and the PAs.

The group considered capping the number of applications included per evaluation. However, reducing the number of projects evaluated per site would create a need to add additional sites to the sample to achieve precision targets—i.e., there is a trade-off between how many applications to evaluate at individual sites and how many individual sites are required to participate.

The decision was also influenced by concerns related to COVID-19 and lack of access to customer sites, adding more sites to a sample may not be feasible. Therefore, we do not think it makes sense to create a hard-and-fast rule regarding the number of applications.

Worth noting, one approach that has reduced potential burden is to track lighting and non-lighting projects separately. However, while lighting and non-lighting projects are easy to break apart based on

tracking data, breaking out projects by end use is more difficult and would require additional review of all site-specific project documentation for large segments of the population.

1.2 Subcategorization of Operational Differences

Operational differences are one category of discrepancies documented as part of evaluations and can account for a large share of differences between planned and evaluated savings. Therefore, the PAs and EEAC Consultants wished to include additional granularity to enable looking more in-depth at the categories of operational differences. The PAs, EEAC Consultants, and evaluators worked together to develop a high-level list of categories of discrepancies, one of which is operational differences.

Within each category, as practical, differences are further subdivided to provide more granular insights. The list of categories is not intended to be exhaustive, nor are subcategories intended to be rigid and fixed. Individual evaluations should identify categories and subcategories early in the evaluation so that engineers are using them consistently, while being alert for other emerging discrepancies.

Table 3-1 provides a preliminary list of discrepancy categories and definitions. This list was developed based on currently used discrepancy categories and discussion with the PAs, EEAC Consultants, and evaluators. We will use these categories as we develop the analysis for the ongoing Custom Gas and Custom Electric studies. Additional discussion of discrepancy analysis will be included in the reports for those studies. Once those studies are finalized, we will update this entry in the memo to reflect final findings and discussion between the PAs, EEAC Consultants, and evaluators. Additional details on discrepancy analysis and cascade method can be found at the following link:

- How to Show the Implementer What to Do Next

Next Steps.

DNV GL plans to include analysis by subcategories as part of the ongoing Custom Electric and Custom Gas evaluations. This will provide an opportunity for the PAs and EEAC Consultants to review and assess the subcategorization. Once the Custom studies are finalized, we can document overarching decisions related to subcategorization in a future Gross Impact Framework memo update.

Table 3-1. Proposed discrepancy categories and definitions

Category	Subcategory	Definition
Operational	Hours of operation	Differences in planned vs. observed operating hours
	Operating efficiency	Differences in planned vs. observed operating efficiency
	Operating load	Differences in planned vs. observed load
	Controls	Controls not implemented as planned (setpoint, over-ride, sequence of operations, etc.)
	Load shape	Differences in annual load shape used for planning and evaluation
Non-Operational	Analysis methodology	Differences in methods used for planning and evaluation
	Pre-project errors (inputs or calculations)	Errors in pre-project inputs or calculations
	Baseline	Differences in baseline assumptions
	Technology	Differences in installed equipment technology
	Efficiency	Differences in installed equipment efficiency

Measure size or quantity	Difference in installed equipment size or quantity
Weather normalization	Differences in weather normalization used in planning vs. evaluation
Ineligible measure	
Measure interactivity	Differences in accounting for interaction between measures or facility systems
Unknown application algorithm or assumptions	Lack of clarity on pre-project planning assumptions
Application and tracking savings	Disagreement between application and tracking savings

1.3 Baseline for ROF projects that involve a change in technology

During ex-ante review of projects, two replace on failure (ROF) projects were examined that involved a change of technology for replacement equipment.

1. A lab facility replaced the old steam heating system with a new hot water system.
2. A school campus installed VRF heat-pumps to replace air handlers equipped with electric heat.

These two cases promoted a conversation about the appropriate baseline for ROF and end of life (EOL) projects that change the design and the technology used for the pre-existing system.

As part of the July 26, 2020 meeting, the Baseline Advisory Group (BAG) discussed the specific projects and implications for future projects.

BAG members agreed that the initiatives should be encouraged to incentivize installation of more efficient technologies and the baseline definition should reflect that principle. The BAG concluded these types of projects will be classified as lost opportunity and consequently the baseline cannot be the pre-existing system as it was found. The baseline will be defined as the ISP of the pre-existing technology, reflecting the typical current efficiency of the technology in the market today. By classifying the baseline as unique and defining the baseline as the ISP applicable to the pre-existing technology, the initiatives will encourage the installation of more efficient technologies on ROF and EOL projects. The savings associated with a change in system or technology type is usually significantly larger than savings associated with more efficient equipment within a technology type.

For the two examples presented above the measure event type is lost opportunity and the baseline is as follows:

1. A lab facility replaced the old steam heating system with a new hot water system. Baseline: ISP applicable to the pre-existing steam system.
2. A school campus installed VRF heat-pumps to replace air handlers equipped with electric heat. Baseline: ISP applicable to the pre-existing electric heat.

Proposed projects will still have to meet the program requirements and be cost effective. The cost of the project will be the incremental cost between the cost of the installed system and the baseline defined based on the method described above.

1.4 Custom Express Tool Adoption

A subcommittee of the EMC will develop a process for reviewing and updating custom express tools. As some projects would be developed using the old tools and evaluated using the new tools, some years will have a combination of both old and new tools. For this reason, we decided against waiting to target the roll-out of new tools to the beginning of the year. New tools should be implemented as soon as they are ready to be used in order to allow evaluators to become familiar with them and minimize the time in which there are two tools in play. Implementers must note which tool was used for each application. Once the new tools are fully implemented across PAs, evaluators will develop a prospective realization rate for immediate use. Future retrospective impact results will be estimated using the new tool in the ex-post analysis.

1.5 Lifetime Savings and Measure Life

As detailed in the March 2020 Decision Guide Memo, the move to dual baselines directly affects lifetime savings calculations for both retrofit and lost opportunity measures. This topic is being addressed in the MA20C08-B-LIFE Lifetime Impact/Baseline Study (results expected in February 2021). Once that study is complete, we will update this section of the memo to document key study findings. In the meantime, please see the MA20C08-B-LIFE Stage 3 plan.

- MA2-C08-B-LIFE Lifetime Impact/Baseline Study Stage 3 Plan

1.6 Ex-Ante Review Process

Impact evaluations are typically conducted on an "ex-post" basis, meaning after project completion. Yet multiple jurisdictions have addressed issues with variance in realization rates by using "ex-ante" reviews—also known as parallel path, real-time evaluation, and embedded EM&V—which involve evaluation related activities prior to project completion.

In 2017, we asked, *Are there opportunities to incorporate ex-ante M&V and other kinds of early involvement into impact evaluation?* Stakeholders rated this issue as a high priority, and the Framework outlined the benefits of ex-ante evaluation involvement, including:

- Understanding of pre-treatment conditions, as post-evaluation often lacks high rigor data for the baseline period and therefore must rely on verbal reporting and memory.
- Reducing downstream uncertainty on site specific realization rates via early agreement between implementer and evaluator on baseline characterization.
- Inspecting pre-retrofit conditions and characteristics that might not be accessible or recalled post-installation.
- Educating the implementer about evaluation methods and savings and M&V considerations.

The Framework also documented issues related to ex-ante involvement, such as the risk that ex-ante involvement could delay measure installation and achievement of savings goals; potential bias in the reviewed portion of the population; and logistical challenges, such as planned measures that are not ultimately implemented and effort and timing associated with pre-metering and facility access.

The primary goal of the Ex-ante Review process is to minimize risk and uncertainty regarding the estimated energy savings values for selected custom projects through real-time feedback and assessment by impact evaluators. Ex-ante Review is expected to be most useful for information gathered prior to project completion, such as information about baseline market events or technologies. The additional work of conducting an Ex-ante Review will be requested on an as-needed basis.

On July 30, 2020, representations of the PAs, EEAC Consultants, and the DNV GL team met to discuss how to operationalize the Ex-ante Review process – specifically focusing on logistics of project tracking

and sampling. This discussion leveraged the Ex-Ante Review Process memo drafted by the MA PAs in December 2019 which is attached to this PDF for ease of reference (Memo_ExAnteReviewProcess_120919_FINAL).

Logistics.

After some discussion of different options, the group agreed to use a single collaborative tracking document maintained by DNV GL with anonymized customer IDs. The tracking document is currently being hosted on DNV GL's SharePoint site and is accessible by DNV GL, the PAs, and the EEAC Consultants. The tracker is a living document that will be updated on a regular basis by the tracker manager. Part of the tracker process will include communication to the EEAC Consultants when Ex-ante Reviews are undertaken so that the EEAC Consultants can decide on the appropriate level of review.

A key issue raised by the EEAC Consultants was the potential need to conduct reviews based on a sample of projects versus a census. It will be up to the EEAC Consultants to determine if they want to review a census of projects or a sample – their decision will largely depend on the volume of expected Ex-ante Reviews. The DNV GL team will provide regular updates directly to the EEAC Consultants, including when the scope of an ex-ante review deviates from the standard approach or includes additional ISP type research.

Sampling of Ex-ante Projects.

The group also discussed the need to include a separate sampling stratum within Custom Impact evaluations for Ex-ante projects. For projects where the implementer agrees with the Ex-ante Review, it is likely realization rates will be closer to one (lower variability), requiring a lower sampling rate. For projects where the implementer disagrees with the Ex-ante Review, it is likely realization rates will be more variable and thus require a higher sampling rate. To this end, the tracker will include placeholders for agreement/disagreement tracking. Custom impact evaluations will start to include this ex-ante review stratum beginning with the evaluation of PY2020 projects in 2021 at the earliest. As sampling for these studies begins, the DNV GL team will assess the 2020 projects in the tracker to estimate a reasonable error ratio for sample design purposes for both gas and electric impact evaluations.

1.7 Special considerations of statewide results and prospective evaluation results

As part of the PY2017-18 Custom Electric Evaluation,[1] an issue arose regarding Franchise Controls measures. During the evaluation, it was found that some PAs were offering Franchise Controls as a Custom offering, others were offering them as part of their small business offerings, and others were not offering Franchise Controls at all. To account for this, ultimately, the evaluation produced two sets of realization rates, one including Franchise Controls and one excluding Franchise Controls. This is a specific example of possible differences in program offerings that may emerge as the PAs continue to add and explore new offerings to achieve program goals.

On the October 8, 2020 Massachusetts Commercial and Industrial weekly project call, the PAs and EEAC Consultants discussed this issue in the broader context of differences in portfolios between the PAs and how to factor that into evaluations. Since the preference is to use PA-specific results when they are reliable, this situation is most likely to impact smaller PAs who rely on statewide estimates. The issue

[1] https://ma-eeac.org/wp-content/uploads/MA_CIEC_Stage5_Report_C07_Custom_Electric_Impact_Evaluation_PY2017_18_FINAL-2020-06-01.pdf

being that if these PAs do not include comparable offerings, the applicability of statewide results may not be appropriate.

Rather than reaching conclusions on principles to handle yet unforeseen situations, the PAs and EEAC Consultants provided guidance to attempt to identify potential misalignment of program offerings earlier in the evaluation process. Based on this, the Custom Electric and Custom Gas evaluations will attempt to identify potential issues related to differences in program offerings after project file review and before site work begins. Evaluators will review projects or measures that occur frequently in the primary and secondary sampled sites for measures that may be new or unique and treated differently by PAs relying on statewide results. A list of such measures would be provided to the small PAs for their review, placing the onus on small PAs to raise the issue for discussion. How to handle these situations will continue to be handled on an ad hoc basis.

1.8 Emerging issues being tracked for future updates

Here we document two outstanding issues that were raised over the course of 2020 but for which decisions were not made. These topics will be targeted for continued discussion in 2021 and any subsequent decisions will be documented in a memo similar to this one in 2021.

1.8.1 Evaluation timing and schedule

The PAs, EEAC Consultants, and Evaluators began discussions regarding evaluation timing and schedule in 2020 but decided to wait to have more in-depth discussions as part of a process expected to begin in the first quarter of 2021. We will continue to track this issue and incorporate a summary of resulting decisions as part of an updated Gross Impact Framework memo in 2021.

1.8.2 Changes to HVAC/Ventilation due to COVID-19

The PAs and EEAC Consultants have created a subcommittee to discuss changes in ventilation due to COVID-19. We anticipate summarizing findings and recommendations regarding this topic in an updated memo later in 2021.