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Re: Effective Useful Life Calculations for programs with custom calculated impacts

Introduction

The purpose of this memo is to facilitate a discussion on how Effective Useful Life (EUL) is calculated for the purpose of calculating CPAS for programs that have custom measures and are subject to retrospective impact evaluation. The ComEd programs in Table 1 are the subject of this memo. Savings are evaluated at different levels across these programs but are primarily at the project level for all but the new construction programs, which are at the building level.

Table 1. ComEd Programs Under Discussion

Sector	Program	Savings Calculation Level
Business	New Construction	Whole Building
Residential	New Construction	Whole House
Business	Custom	Project or Measure
Business	RCx	Project
Business	Data Center	Project
Business	Industrial Systems	Project
Business	SEM[1]	Project

Our context is primarily from the evaluation perspective. We want to reach agreement on how the evaluation will calculate EULs and use them in the CPAS calculation and whether the EUL calculation will be retrospective or prospective. We should reflect on the implications for program design and management as we consider the issues.

Regardless of whether EULs are applied prospectively or retrospectively, the evaluation team expects to perform research to improve the current knowledge of EULs.

[1] SEM = Strategic Energy Management, SEM measure life is mostly based on the persistence of actions rather than the technical life.

The questions at hand are:

1. Should EULs be deemed prospectively or subject to ex post evaluation adjustment?

2. How should EULs be calculated?

We discuss each of these questions below. The last section of this memo is an extract from Navigant's EUL report from December[2], presented to give additional context for the discussion.

Should EULs be deemed prospectively or subject to ex post evaluation adjustment?

The claimed savings for the programs under consideration are based on ex post gross and a deemed NTG ratio. Unlike programs based on measures in the TRM, the evaluation can retrospectively adjust any aspect of the gross impact calculation for these programs. The evaluation calculates net savings from the ex post gross savings using a prospectively-deemed NTG ratio. The key question, then, is should the EUL be treated like the gross savings and retrospectively adjusted? Or should the EUL be deemed in advance like the NTG value?

Regardless of the answer to this question, the evaluation will plan research on EULs for these programs. If the EUL is to be deemed, the evaluation will plan research to improve the EUL estimates and submit it to the TAC for consideration for inclusion in the TRM. If the EUL is not to be deemed, the evaluation will perform research (probably largely the same) to calculate EULs and use them to calculate CPAS for the program year under study.

Arguments in favor of prospective deeming EUL

- Like with NTG, deeming EULs will provide greater predictability to program designers and managers as they implement their program.
- The people doing the hands-on work of getting projects in the door may have little ability to adjust their procedures to attempt to improve the project's EUL (although this point is speculation and ought to be researched).
- The data collection and tracking aspect of project- or measure-specific EULs might place a significant burden on program staff and data systems (another point that ought to be researched).[3]

Arguments for retrospective calculation of EUL

- Expressing utility goals in CPAS instead of first year savings gives the utilities incentive to pursue long-lasting measures. Deeming EULs for a given program year may reduce the motivation of program implementers to focus on long-lived measures. (However, assuming the evaluation updates EULs based on research on ComEd projects, managers with an eye on the long-term goal will still have motivation to focus on long-lived measures.)
- Utility goals are denominated in CPAS and retrospective calculation of EULs will support more accurate CPAS calculations.

[2] ComEd Effective Useful Life Research Report 2017-12-13, p.11.
[3] There are efforts underway to provide a preliminary indication on the ability to do measure level analysis, the level of effort, and the value of ongoing or periodic analysis on the Business New Construction program.

How should EULs be calculated?

Regardless of whether EULs are deemed prospectively or calculated retrospectively, we should all reach agreement on how EULs are calculated for each program and project type under discussion and which party is responsible for tracking what data. This discussion ought to include people who understand the fine points of the data that is currently tracked and those who can address the level of effort that would be required for the program staff to be responsible for tracking key inputs to the EUL calculation. It may be that we reach agreement that the level of effort for tracking project-level or measure-level EULs is too burdensome for some programs and is thus left to evaluation research. For other programs, the burden may be small enough that some additional data collection by the program might greatly improve EUL calculations. In reviewing this decision, it is important to note that the two components of EUL – technical life and persistence – and what is the level of effort of defining it for the custom project or measure.

Issues that should be discussed and resolved include:

- Which programs (or perhaps subsets of programs) should have EULs estimated at the project level, not the measure level.
- Should measure-level EULs be estimated and recorded by the program (as discussed above).
- How can we identify early replacement and dual baseline measures in the tracking data so their EULs can be accurately described?
- How will measure-level EULs be extrapolated to the population if only a subset of the projects have measure-level detail (or are subject to evaluation research and are sampled).
- We need to define rules that will address exceptional circumstances. For example, if we agree on procedures for the program to track (or evaluation to estimate) measure-level EULs for each project, we might want a default assumption to fall back on if a particular project is not amenable to accurate measure-level analysis.
- EUL is a combination of technical measure life and persistence. Whether program staff enter measure-level EULs or the evaluation estimates them from a sample, we will have to establish procedures to document the source of the estimates and clearly spell out whether persistence is included in the estimate. If it is not in the estimate then we will need separate estimates of persistence to use.

Research is underway on persistence for the RCx program and the evaluation team is preparing a draft research plan for addressing persistence in other programs.

Background – EUL Report Recommendation

The Navigant EUL report[4] examined EULs for custom and custom-like programs and provided the following recommendation, provided below between the solid lines for background:

Version 6 of the IL TRM does not specify EUL assignment for measures not currently defined in the IL TRM (i.e. custom measures). For purposes of this report, a "custom measure" may include new measures that have not previously been defined in the IL TRM or a measure that includes a savings estimate that comprises a mix of current IL TRM measures. This report recommends using a weighted average (weighted by first year annual kWh savings) across the mix of measures to develop EUL values for custom measures. The approach for custom measures will be different from a prescriptive measure because the custom measure EUL is dependent on a mix of measures and/or measures not previously defined in the IL TRM. One exception to this approach is for commercial new construction programs, our proposed EUL approach for those programs is described in Section 3.1 below.

Regarding the responsibility for defining the measure life, Navigant recommends that the EUL assignment be multi-faceted.

- Program and portfolio planning – default values or historical (verified) values.
- Implementer – the tracking database should have a description and an assigned measure life for every itemized measure – either from the IL TRM, the existing EUL study, or one determined by the implementer. If determined by the implementer, it should follow the EUL assignment guidance provided with this report in Section 2.4.
- Evaluator – validates the assigned EUL and provides a verified value that replaces the implementer defined value (specific measure or project level review may only occur for a sample).

…

Navigant identified the list of EUL estimates shown in Table 3-1 (supporting documentation is in the companion workbook). These are the values referenced in step 5 above and are our recommendations for EUL values program implementers can to assign to custom measures or programs when the steps defined above produce insufficient information to create a custom EUL for the measure.[5]

Table 3-1. Default Planning Custom EUL Values[6,7]

Measure	EUL (Years)
Commercial - New Construction	15
Commercial - RCx	9
Commercial - Data Center	15
Commercial - Other, HVAC	13
Commercial - Controls	15
Commercial - SEM[8]	TBD
Residential - New Construction	18

Source: Navigant

[4] ComEd Effective Useful Life Research Report 2017-12-13, p.11.
[5] Other uses for these default measure life values are for the custom program weighted average measure life by measure type for portfolio and program planning purposes and when the evaluation team needs to calculate CPAS, lifetime savings, or TRC and the ex-ante database project/measure descriptions are insufficient for assigned a project/measure specific measure life.
[6] Appendix C includes a companion workbook with specific source references for each value in this table.
[7] Section 3.1 provides further details on the new construction measure life.
[8] SEM = Strategic Energy Management, SEM measure life is mostly based on the persistence of actions rather than the technical life.

Navigant emphasizes that the default EUL values should only be used for planning purposes or for ex-ante estimate if the documentation the implementer finds is insufficient for supporting some other value. It is expected that the implementer provides sufficient measure descriptions and appropriate EUL assignment for each measure within a project.

Commercial New Construction Measure Life

The new construction program calculates savings for each project using a whole building approach, measure savings and useful life are not quantified at the measure level. New construction measures that make up the incremental improvement over the baseline may vary across a range of measures including appliances, HVAC, and insulation. If possible, an implementer should attempt to estimate project-level savings using the custom measure methodology described above. This custom measure methodology requires an implementer to assign effective useful life at the measure level. The implementer should then aggregate each of the measures that comprise project savings using a weighted (based on energy savings) average measure life to create the project measure life.

Unless or until the implementer estimates a project level measure life as described above, Navigant recommends the LBNL-sourced default EUL of 15 years for commercial new construction measures. The recommended commercial new construction default measure life is based on a nationwide compilation study of evaluated commercial new construction programs conducted by Lawrence Berkeley National Labs in 2015.[9]

[9] https://emp.lbl.gov/sites/default/files/lbnl-179191.pdf, "Energy Savings Lifetimes and Persistence: Practices, Issues and Data", May 2015.