Early Retirement Using Preponderance of Evidence

Version 1.0

Revision History

Version No.	Date	Description	Author
0.91	January 29, 2013	Draft	SCE
0.92	May 9, 2014	Draft living document – comments lead to revision	SCE
1.0	July 16, 2014	Final living document	SCE/CPUC

Contents

1 Introduction

This document provides guidance on determining program-induced early retirement of the existing equipment with more energy-efficient equipment. The regulatory background that provides the framework for establishing appropriate baseline for energy efficiency projects is described first, followed by key definitions of Effective Useful Life (EUL) and Remaining Useful Life (RUL), and different types of installations. Then the concept of using preponderance of evidence to determine program-induced early retirement is explained and suggested guidance to document evidence to support this claim is listed. Finally five examples have been shown to demonstrate the application of recommended guidance. This document does not cover evidence required to support other types of installations.

1.1 Regulatory Background

D.11-07-030 Attachment B at B13 states

"The baseline parameters are selected by establishing the project category from the possible alternatives including New Construction or Major Renovations, program induced Early Retirement, Standard Retrofit or Normal/Natural Replacement/Turnover, and Replace On Burnout. These alternative categories result in the utilization of alternative baseline parameters set by Code or Standard requirements, industry standard practice, CPUC policy, or other considerations. In the review of [program administrators'] projects Energy Division will follow the guidelines as presented here in establishing the baseline for all gross savings estimates."

"Pre-existing equipment baselines are only used in cases where there is clear evidence the program has induced the replacement rather than merely caused an increase in efficiency in a replacement that would have occurred in the absence of the program."

"These early or accelerated retirement cases may require the use of a "dual baseline" analysis that utilizes the pre-existing equipment baseline during an initial RUL period and a code requirement/industry standard practice baseline for the balance of the EUL of the new equipment."

D.12-05-015 at 347 states

"We note that D.11-07-030 may not reflect our clarification that the compelling evidence standard for the determination of baseline equipment must be applied to both possible outcomes.[492] Specifically, D.11-07-030 notes that it is necessary to establish, by a preponderance of evidence, that the program has induced the replacement rather than merely caused an increase in efficiency in a replacement that would have occurred without the program.

We direct Staff to update and distribute to the service list of this proceeding Appendix 1 of Attachment B to D.11-07-030, to incorporate clarifications provided here regarding baseline for gross savings estimates, and to indicate that a preponderance of evidence on the motivation for equipment replacement shall be utilized to determine which of the two baseline alternatives is applied for all gross savings estimates."

[492] D.11-07-030 at 40.

D.12-05-015 at 347 states

"Once it is established that the program caused the existing equipment to be replaced early, we need to establish the period of accelerated retirement. In our discussion of DEER updates above, we note that DEER contains values for the effective useful life for many technologies and recommend using one-third of the effective useful life as the remaining useful life until further study results are available to establish more accurate values. For the case of program induced early retirement, the remaining useful life of the existing equipment should be used as the starting assumption for the period of accelerated retirement."

"As is the case when evaluating evidence for program induced early retirement, evidence for the remaining life and the period of accelerated replacement of the existing equipment can also be reviewed. The use of a DEER remaining useful life starting point for the acceleration period may be replaced. However, this should be allowed only if credible evidence is available to support an alternative value and that evidence leads Commission Staff to deem it more credible than of the adopted DEER values. Commission Staff should develop guidelines for the evaluation of remaining useful life evidence for the replacement of the DEER default values for specific projects and technologies. We provide this flexibility to utilize alternative remaining useful life values, based upon project or technology specific evidence, in place of the DEER adopted values primarily for use in Staff's review of the utilities' custom project and measure ex ante values."

D.12-05-015 Attachment A at 12 states

Not all equipment retired before it burns out is eligible for consideration to be treated as a program induced early retirement. Sometimes, as in the case of new construction, the early retirement baseline is not an option. However, when early retirement is an option the evidence that supports program induced early retirement must be weighed against the evidence supporting a replace-on-burnout or normal replacement baseline or new construction choice. It is necessary to establish that a preponderance of evidence indicates the program has induced the replacement rather than merely caused an increase in efficiency in a replacement that would have occurred in the absence of the program. Once the preponderance of evidence review has established that the program caused the existing equipment to be replaced earlier than would have happened in the absence of the program, there is a need to establish the

period of accelerated retirement. DEER contains values for the effective useful life (EUL) for many technologies and recommends using one-third of the EUL as the remaining useful life (RUL) until further study results are available to establish more accurate values. For the case of program induced early retirement, the RUL of the existing equipment should be used as the starting assumption for the period of accelerated retirement.

2 Key Definitions

Prior to calculating energy savings, typically in industrial/manufacturing facilities, a project boundary should be defined which includes all energy-using equipment and/or systems that are modified, installed, or constructed to improve energy efficiency. A proper definition of the project boundary is necessary for two reasons: (1) to account for the energy usage of all impacted equipment/facilities so that savings can be estimated accurately at the grid/system level, and (2) to properly establish the RUL/EUL and to provide evidence for the assigned baseline. For example, when a customer decides to insource the production or treatment of materials that was previously outsourced to another firm, energy saving estimates must consider the total impact on the grid (at the facility seeking to insource and the facility currently producing or treating that material). Likewise when an energy-efficient action requires a participant to use materials that are more energy-intensive to produce than the baseline condition, the total grid/system impact should be reflected in the energy saving calculations.

2.1 Useful Life Definitions

2.1.1 Effective Useful Life

The Effective Useful Life (EUL) is an estimate of the median number of years that the measures installed under the program are still in place and operable. EUL values are for new equipment and are provided as years. This allows the EUL to be directly employed with CPUC authorized annual avoided costs and measure-specific energy savings to determine the lifecycle dollar benefits associated with a particular measure. Current CPUC policy limits EUL values to 20 years.

DEER provides estimated EUL values for many different measures. These are typically based on "retention studies" that use measure equipment removal or replacement data to develop measure survival curves that are used to determine (statistically) the median life of a measure. EUL values should be taken from DEER when available and the source of the EUL value claimed must be cited explicitly in the project documentation. EULs for lighting measures may vary by operating hours and require a calculation for each individual fixture/lamp installation. When EUL data is not available in DEER, additional studies, manufacturer data, past maintenance records or data on similar measures may be utilized to justify a proposed EUL for a measure and the proposed value will be subject to review. When a non-DEER EUL is proposed for a system, the life, in years, of its major subsystems must be considered.

Calculated projects that combine multiple measures into a single project, such as a whole building approach used in new construction and some retrofit projects, must list the individual EUL value (and EUL source) of each measure included in the calculation. The approach for reporting the EUL value by solution code may vary depending on the program administrator's reporting practice, but must follow practices that provide accurate cost effectiveness results as well as accurate first year and life gross and net savings. Combining multiple measures into a single project claim should only be done when the individual measure EUL values are equal or very close so as to maintain the accuracy of both the savings and cost effectiveness calculation

results. Any method for combining measures with unequal EUL values must be documented and is subject to Commission staff approval. Commission staff does not expect to perform this review and approval on a project-by-project basis but rather requires that the proposed methods to be utilized for classes of projects be submitted for approval.

2.1.2 Remaining Useful Life

The Remaining Useful Life (RUL) is an estimate of the median number of years that equipment being replaced under the program would have remained in place and operable had the program intervention not caused the replacement. No survival rate studies have been recently conducted to determine this estimate for many measures. Per D.12.05.015 at 347, the starting point default estimate for any equipment RUL is one-third the EUL for that equipment. Use of an alternate value for RUL requires evidence that must be documented and maintained in the project files and must be based upon an approach subject to Commission staff approval. Commission staff does not expect to perform this review and approval on a project-by-project basis but rather requires that the all proposed approaches to be utilized for classes of projects be submitted for approval. The most common uses of equipment RUL values are: 1) to establish the acceleration or first baseline period for program induced early retirement projects; 2) to place an upper limit on the life for projects which alter existing equipment or systems; 3) to establish the life for other equipment removal activities such as appliance recycling. In custom project activities the first two of these uses are common.

For calculated measures, one reference point to consider in evaluating potential alternative RUL values is the existing equipment installation date so as to determine the equipment RUL as the EUL minus the age of the equipment. A value close to zero or negative is an indicator that RUL less than the policy default may be appropriate. Likewise, replacing a newer equipment might suggest an RUL that exceeds the policy default value. However, the age of existing equipment may be less important than normal facility remodel, or planned process retrofit and/or planned equipment upgrade or replacement cycle. This data may be site- and company-specific or may be market based. Additionally, maintenance, overhaul, rebuild, and reconditioning history and other documented status on equipment condition may be considered to replace the policy default RUL. For industrial processes, building shell projects and other situations where the where EUL was limited by policy rather than survival data, the consideration of these alternative data normally are more important considerations than age compared to EUL.

2.1.3 Second Baseline Period (Effective Useful Life – Remaining Useful Life)

For program induced early retirement dual baseline measures the Effective Useful Life minus Remaining Useful Life period is also referred to as the second baseline period.

2.2 Installation Type Definitions

2.2.1 New Construction

The New Construction (NC or NEW) category includes new equipment that has been installed in a newly constructed area, in an area that has been subject to a major-renovation involving complete multi-system replacement or area re-construction, or equipment installed to

increase the capacity of existing systems due to existing or anticipated new load handling requirements. An approved single baseline energy savings calculation approach and estimate, the incremental measure cost, and a measure EUL with justification is required for this installation type.

2.2.2 *Replace on Burnout*

The Replace on Burnout (ROB) category includes situations when new or replacement equipment has been installed due to imminent or actual failure of pre-existing equipment. To properly determine the savings claim and cost-effectiveness of ROB installations, the following information is required: an approved single baseline energy savings calculation approach and estimate, the incremental measure cost, and a measure EUL with justification.

2.2.3 *Normal Replacement*

The Normal Replacement (NR) category includes measure installations where the existing equipment is still functional and the available evidence does not support a determination of program-induced early retirement. This type of normal replacement is also referred to as normal/natural turnover. Normal replacement also applies when the new or replacement equipment has been installed due to normal remodeling or upgrading or replacement activities which are expected and undertaken in the normal course of business or ownership. To properly determine the savings claim and cost-effectiveness of NR installations, the same information is required as ROB installations; an approved single baseline energy savings calculation approach and estimate, the incremental measure cost, and a measure EUL with justification. Note: some program administrators include NR as a subset in the ROB category.

2.2.4 *Early Retirement (AKA 'Program-Induced Early Retirement')*

The Early Retirement (ER or RET) category includes measure installations where there is a preponderance of evidence (see section 3,4 and 5 below) that an energy efficiency program activity induced or accelerated equipment replacement. Early retirement measures must provide justification that the existing equipment being replaced would have continued to function and perform its original design intent during the proposed RUL in absence of the replacement. Evidence that the equipment **could** have remained operational is not sufficient; the evidence must indicate that the equipment **would** have remained in operation. Thus early retirement treatment includes an analysis of what the equipment user or owner intended for the future use or non-use, not just that the equipment was capable of continued use. The period of accelerated retirement is either the DEER default RUL of one-third the EUL, or an evidence-based alternate RUL. In all cases, evidence of viable functionality and continued intent to use the existing equipment must be provided (maintained in the project file); thus, the burden of proof to claim program-induced early retirement is not merely the need to demonstrate possible equipment survival for the proposed RUL but the intent of continued equipment use during the proposed RUL period. Program-induced early retirement claims becomes more difficult to demonstrate as the age of the existing equipment approaches and/or exceeds the equipment EUL.

The period of remaining EUL of the new installation after the RUL of the replaced equipment expires (which has a length of the new equipment EUL minus the pre-existing equipment RUL) is referred to as the 'second baseline' period. The second baseline for early retirement measures is the known code that will be in existence when the second baseline becomes effective. In some cases the second baseline will not become effective until many years from project completion, and in these instances the future governing code may not yet be defined. In these cases, the second baseline calculations should use the latest adopted available code even if it is not yet effective (for example, 2013 Title 24 until a later version is adopted) or the current industry standard practice.
To properly determine the savings claim and cost-effectiveness of early retirement installations, the following information is required: an approved dual baseline energy savings calculation approach, full measure cost, incremental measure cost for the second baseline, a measure EUL with justification, and the proposed RUL of the existing equipment supported by evidence.

2.2.5 *Add-on Retrofit (AKA 'Retrofit Add-on')*

The Add-on Retrofit (REA) category includes situations where new equipment has been installed onto an existing system as either an integral additional component or a substitution of a pre-existing add-on component whose primary purpose is to improve overall efficiency of the system. Such a component must not be able to operate on its own. Retro-commissioning measures for which no additional equipment is purchased or measures involving the addition of a variable speed drive to an existing motor drive process will fall under this category.

The EUL of REA measures is capped at the RUL of the equipment being retrofitted. This means that REA measures utilize the RUL of the pre-existing equipment up to and not to exceed the EUL for the REA measure. For example, adding a variable speed drive to a HVAC air-handler or a process motor will have the measure EUL limited by the RUL of the equipment to which the variable speed drive was added. For a more specific example, suppose a variable frequency drive (vfd) is an REA measure being installed on an existing pump. The vfd and the pump, when brand new, would have a 15 and 15 year EUL from DEER, respectively. The DEER default RUL for the pump is the 15 year EUL divided by 3 or 5 years. The existing pump was installed in 2010 and there is no evidence that the pump has any performance or other issues that indicate it will not survive or be replaced before its DEER EUL therefore an alternative RUL calculation of 11 years is supported and acceptable [15 year EUL – (2014 – 2010) = 11 years] as of 2014. The vfd measure may claim 11 years as this is established the RUL of the pump (the 11 years did not exceed the 15 year EUL for a vfd from DEER).

To properly determine the savings claim and cost-effectiveness of REA installations, the following information is required: an approved single baseline energy savings calculation approach and estimate, full measure cost, and a measure EUL with justification.

(Note: Retro-commissioning audits that result in equipment replacements must be reviewed on a case-by-case basis and classified as either NEW, ROB, NR, ER/RET or REA.)

2.2.6 EUL/RUL Periods for all Installation Types

Table 1. EUL and RUL periods for all Installation Types

Program Install Type	Measure Life Basis	(RUL)/First Period Energy Savings Baseline	(EUL – RUL)/Second Period Energy Savings Baseline
NC (NEW)	EUL	Code or Industry Standard Baseline	N/A
ROB	EUL	Code or Industry Standard Baseline[1]	N/A
NR	EUL	Code or Industry Standard Baseline[1]	N/A
ER (RET)	RUL/ EUL-RUL	Customer Existing Baseline	Code or Industry Standard Baseline[1]
REA	RUL or EUL	Customer Existing Baseline	N/A

Note 1: The baseline shown here must be the more efficient of existing equipment or code or industry standard practice. Please see the separate ISP Guide document for guidance on how to determine the Industry Standard Practice Baseline.

3 Preponderance of Evidence for Early Retirement

"Preponderance of Evidence" is a term that defines the convincing evidence required to justify an early retirement claim. The requirements to successfully demonstrate the preponderance of evidence go above and beyond the normal rigor required to justify a NC/NEW, ROB, REA, or NR installation type. This evidence consists of two basic components, program influence and continued viability of the existing equipment.

The following are suggestions on the types of evidence that should be collected to support a preponderance of evidence determination for early retirement measures. The preponderance of evidence analysis involves collection of all relevant evidence and then considering that evidence for its reliability and conviction. The preponderance of evidence determination is not based on the amount of evidence but rather on the more convincing evidence based on its probable truth and/or accuracy.

To support a preponderance of evidence analysis for an early retirement (ER/RET) claim

- Include dialogue from previous customer/program administrator meetings showing how the program administrator accelerated the early retirement of the existing measure. Include meeting dates and participant names. Provide details on the high efficiency measure/s that were proposed by the program administrator. Include evidence to show how the program administrator made customer/s aware of program features.
- Provide simple payback calculations with and without the program administrator incentive, and a comparison to the customer payback threshold.
- Provide documentation of any additional drivers for the project not related to energy efficiency.
- Provide information on customer's normal replacement, remodeling and equipment replacement practices
- Provide documentation of any preliminary measurements performed by the program administrator or the customer to demonstrate equipment functionality
- Document the known standard efficiency equipment alternatives available in the market or those considered by the customer
- Include existing equipment installation dates (and old existing equipment invoices if available).
- Include a discussion of the critical components of the system or equipment and associated maintenance practices, and the current and future availability of replacement parts in the market.
- Provide a proposed remaining useful life (RUL) of the existing measure supported by evidence suggested in this guidance document.
- Include a discussion of the normal lead time required by the customer to undertake the project including planning, approval, equipment ordering, and project scheduling. Note that the amount of time the RUL of the pre-existing equipment exceeds this time is the acceleration period. An acceleration period of less than one year is not acceptable.

- Provide customer statements regarding the viability of and continued intent to use the existing equipment through the proposed RUL period.

4 Preponderance of Evidence Examples

4.1 Project Example # 1

An IOU claimed early retirement for a 44-year old transformer that was proposed to be replaced with a more efficient transformer. The IOU provided no evidence of early retirement with the application documents. After further follow up at the Commission staff's request, the IOU clarified that the original transformer was being replaced because the load center was underground and all of the equipment had been subject to repeated water intrusion. The in-situ transformer was also reported too hot to touch while in service. Commission Staff determined that the transformer was not functioning as intended, therefore, did not meet the expectations of operational functionality required to qualify for early retirement. Since the evidence did not suggest that transformer had remaining useful life and the baseline was considered as replace-on-burnout.

4.2 Project Example # 2

This project involved the installation of occupancy sensor controlled thermostats in all the guest rooms of a large hotel. The retrofit entailed controlling the guest room's fan coil unit (FCU) with a thermostat that interfaced with an occupancy sensor in the room to allow the fan coil unit to run only when the room is occupied. The pre-existing guestroom FCU controls were INNCOM stand-alone wall thermostats. The thermostats could be manually set by either the guest room occupant or by the hotel staff. The guestroom FCUs had three fan speeds and is equipped with chilled water and hot water coils for cooling and heating. The pre-existing thermostat determined the fan speed and whether the unit provided either cooling or heating. Commission staff consultant conducted an NTG interview with the customer and the findings are presented below:

> The purpose of this project was to install HVAC occupancy controls in the guestrooms of a large hotel. The occupancy sensors were integrated into new thermostats installed as part of the project, and door opening sensors were also installed. The idea for the project originated with an energy audit of the entire facility conducted by a third party consultant in 2012 that was funded by the utility. Possible energy efficiency projects identified in the audit were evaluated individually, and each received a go/no go decision from corporate decision makers based on return on investment (ROI), simple payback period, up-front costs, and the reliability of projected savings. Additional important reasons cited for implementing the project were information provided through the audit and corporate environmental policy.
>
> Economics: This customer focuses on reducing energy costs as an important part of keeping overall costs as low as possible, and also has a clearly articulated and binding policy regarding environmental preservation. As part of corporate policy, the rooms are renovated every seven years. The

thermostats that were replaced in this project were approximately four years old and had approximately seven years of remaining useful life, but the expected energy savings provided by the occupancy sensors made it worthwhile to replace the thermostats before the end of their useful life. The expected payback period on this project was 1.9 years and would have been 2.6 years without the rebate, whereas the payback threshold for the company was three years.

As mentioned above the decision to pursue this project was based on important program elements including economic analysis, savings reliability, and information provided through the audit. The only non-program element that received a high importance rating was compliance with corporate environmental policy. The customer rated the likelihood that they would have installed exactly the same program qualifying equipment in the absence of the program at a 1 out of 10 and said that without the information provided by the audit, they would not have had a meaningful basis on which to identify worthwhile projects and predict savings associated with those projects. The customer said that in the absence of the program they would have most likely done nothing or installed thermostats without occupancy sensors.

The Commission staff concluded that the participant was replacing equipment sooner than their established corporate policy for normal replacement and refurbishment every seven years and that the decision was driven by the assistance provided through program activities. The evidence supported the early retirement claim.

4.3 Project Example # 3

A customer had replaced five of seven injection molding machines during the 2006-08 program cycle using program incentives. When these injection molding machines were replaced, the average age of the existing machines ranged from 9 to 11 years. The customer did not replace two remaining injection molding machines at that time, citing that not enough capital was available. The average age of these two injection molding machines (IMMs) at the time of initial program participation was five years. The customer decided to replace the remaining IMMs in 2013 and sent an email to the account representative asking about continued availability of incentives. The IOU account representative affirmed that the equipment qualified for incentives and proposed an ER/RET claim. No evidence was provided by the account representative to demonstrate that the program activities continued attempts to encourage the customer to replace the remaining two IMMs sooner after the initial replacements were incented during the 06-08 cycle. The customer appeared to have decided to replace the remaining IMMs when they reached the planned normal replacement age of 9-11 years. The timing of the customer's decision was not demonstrated as influenced by the IOU program. The evidence instead was more convincing to support that replacements were occurring on a normal replacement schedule without waiting for equipment to fail. The project was deemed as normal replacement with industry standard practice baseline.

4.4 Project Example # 4

An IOU was working with a government customer since 2008 to encourage replacement of chillers, HVAC controls and lighting systems. The chiller was about 26 years old at the time initial discussions began with the IOU. The customer was then not ready to replace the equipment because of a lack of financing and an expiring lease for which a decision was not made to continue operating from that location.

The equipment deteriorated further since the project discussions began. During Commission staff consultant's pre-installation site inspection in 2013, the energy management system (EMS) was not able to respond to zone demands and the facility was manually adjusting temperatures using local overrides by placing ladders in the work areas to access the controls. The EMS system was also outdated and unserviceable. Occupancy sensor controls were found to be overridden in many instances. The facility contact provided a letter stating that they would have operated the equipment in the current conditions for a few more years. However they decided to proceed with replacement after the IOU helped them put a financing package together.

Staff determined that the equipment was on its last leg and was failing to meet performance expectations; therefore, it did not have any RUL. The customer did not replace equipment soon after the initial proposal was made by the IOU and waited until the financing arrangements and uncertainty over the lease renewal were addressed. The IOU had significant influence in inducing the customer to replace equipment but in staff's judgment the preponderance of evidence suggests that the IOU did not induce an early replacement. The project was considered as ROB with code baseline. It is likely that the net to gross (NTG) score for this project (using an ROB savings basis) would be high given IOU involvement.

4.5 Project Example # 5

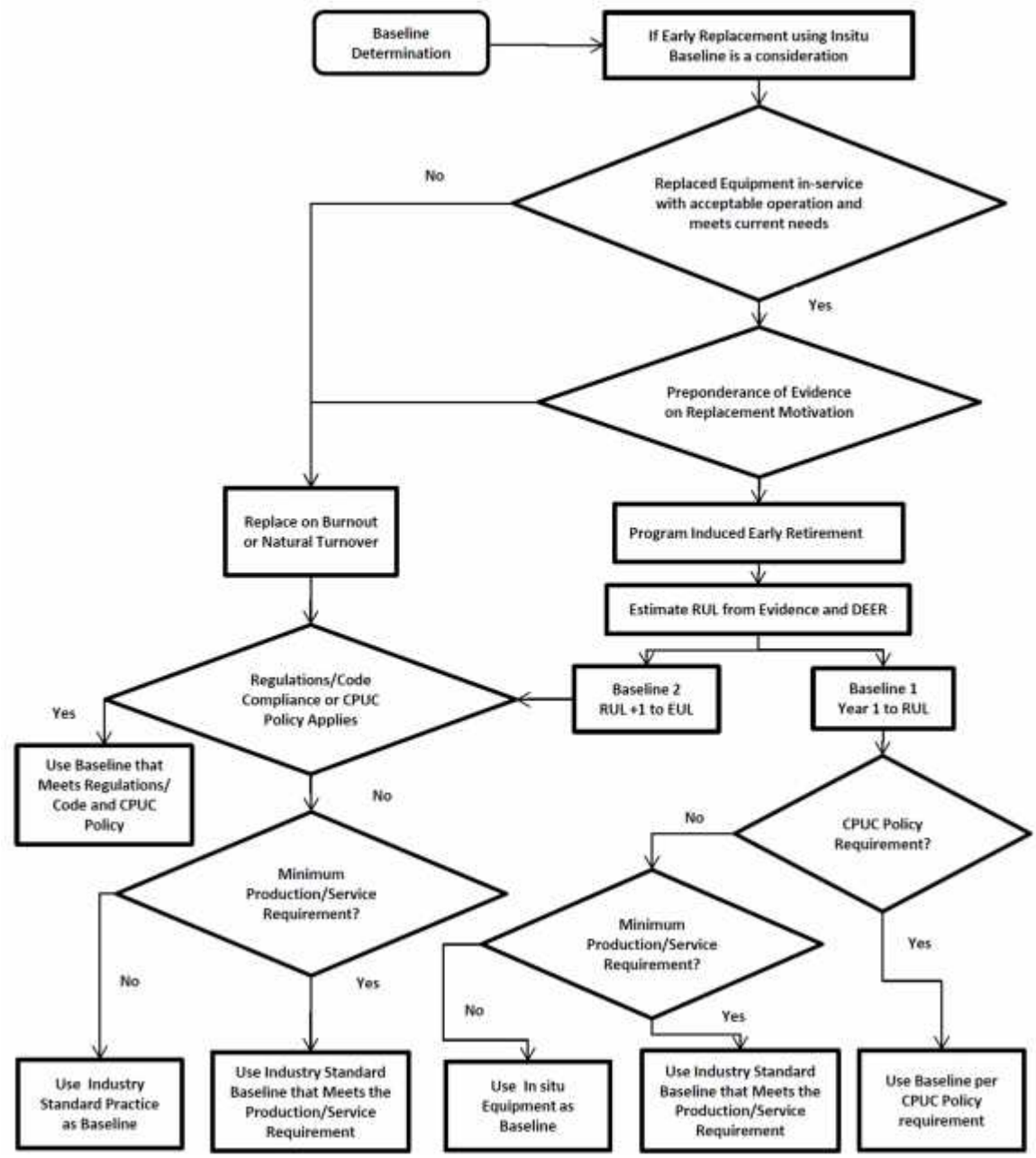
There may be situations where program influence must also be assessed for a non ER/RET measure. This example involves a, a measure that was installed as part of a major renovation for which the program administrator proposed to claim as ER due to a corporate energy policy that the IOU believed it has previously influenced. In these types of cases the IOU may be able to claim added savings above that from a code baseline or previous standard practice baseline if it was able to demonstrate their continuing efforts have influenced the current equipment replacement. Code or standard practice baselines are assigned for ROB/NC/NEW/NR projects – previous standard practice baselines, which exceed code, come into play in renovations so as to prevent the assignment of a regressive baseline which is disallowed by policy. Please also see the separate Influence and Net to Gross guidance document for more information on demonstrating program influence as compared to the preponderance of evidence relating to early retirement determination described in this document.

In this instance the IOU provided copies of email correspondence and a summary of past interactions with the corporate customer to demonstrate its ongoing program interactions

with the customer. Commission Staff reviewed the supplied documents and concurred that evidence demonstrates on ongoing relationship with the customer. However, the correspondence did not demonstrate that the IOU influenced the design changes that occurred from the preliminary prototype plans from either December 2011, or before, to the final site specific permit plans of February 2012. Preponderance of evidence suggested that the project was a planned remodel of chain stores, not program-induced early retirement of the existing equipment. The project baseline was considered as new construction, not early retirement.

5 Attachment B Appendix I of D.11-07-030 as Updated per D.12-05-015

Energy Division Methodology for Determination of Baseline for Gross Savings Estimate[1]



[1] D.12-05-015 at 347 states "We direct Staff to update and distribute to the service list of this proceeding Appendix 1 of Attachment B to D.11-07-030, to incorporate clarifications provided here regarding baseline for gross savings estimates, and to indicate that a preponderance of evidence on the motivation for equipment replacement shall be utilized to determine which of the two baseline alternatives is applied for all gross savings estimates." Changed or added text from original is highlighted in red. Above diagram has been updated and replaces the original.

Review of Baseline for Gross Savings Estimates

The estimation of ex ante saving values requires the selection of a baseline performance for every project. The baseline selection and specific baseline parameters are of primary importance to establishing the ex ante savings estimates. The baseline parameters are selected by establishing the project category from the possible alternatives including New Construction or Major Renovations including New Load or Capacity Expansion, program induced Early Retirement, Standard Retrofit or Normal/Natural Replacement/Turnover, and Replace On Burnout. These alternative categories result in the utilization of alternative baseline parameters set by Code or Standard requirements, industry standard practice, CPUC policy, or other considerations. In the review of IOU projects Energy Division will follow the guidelines as presented here in establishing the baseline for all gross savings estimates.

Notes to above flowchart

Pre-existing equipment[2] baselines are only used in cases where the preponderance of evidence indicates the program has induced the replacement rather than merely caused an increase in efficiency in a replacement that would have occurred in the absence of the program. This preponderance is based on the more convincing evidence and its probable truth or accuracy, and not on the amount of evidence. Commission Staff should use its ex ante review process to establish guidelines on how to evaluate and weigh different types of evidence for the determination of the appropriate baseline alternative.[3]

Pre-existing equipment baselines are only used for the portion of the remaining useful life (RUL) of the pre-existing equipment that was eliminated due to the program. These early or accelerated retirement cases may require the use of a "dual baseline" analysis that utilizes the pre-existing equipment baseline during an initial RUL period and a code requirement/industry standard practice baseline for the balance of the EUL of the new equipment.

- A pre-existing equipment baseline is used as the gross baseline only when there is preponderance of evidence that the pre-existing equipment has a remaining useful life and that the program activity induced or accelerated the equipment replacement. This baseline can only apply for the RUL of the pre-existing equipment.
- A code requirements or industry standard practice baseline is used for replace-on-burnout, natural turnover and new construction (including major rehabilitation projects) situations. This baseline applies for the entire EUL as well as the RUL+1 through EUL period of program induced early retirement of pre-existing equipment cases (the second period of the dual baseline case.)

CPUC policy rules and IOU program eligibility rules govern the baseline

[2] Here the term equipment is intended to cover all technology cases including envelope components, HVAC components and process equipment and may also include configuration and controls options.
[3] D.12-05-015 at 347

A careful review of utility and third-party program and CPUC policy rules must be undertaken and adjustments applied to gross savings in some cases. Adjustments are indicated for gross when there was clear evidence from program or policy rules that savings claims could not be made nor rebates paid for the baseline in question. Program rules come into play with respect to gross baseline requirements, for example, when those rules specify:

- a minimum required efficiency level;
- a minimum percentage improvement above applicable minimum code requirement;
- a minimum RUL of the existing equipment;
- the type or range of retrofits that are allowed be included in a program.

CPUC policy may apply to establishing gross baseline when Policy Manual Rules, a CPUC Decision or a decision maker Ruling includes special requirements or consideration for the situation or technologies of a measure. For example, projects or sites that involve fuel switching, co-generation or renewable technologies are usually subject to special baseline considerations (or other considerations) that must be considered in the savings estimates.

Minimum production level or service requirements govern the baseline

In some situations, a measure for which savings might be claimed could be determined to be the only acceptable equipment for an application. In such cases, the baseline must be set at the minimum needed to meet the requirements, which may be the same as the equipment planned for installation. An example would be an industrial process where only a variable-speed drive pumping system could meet the production requirements. For situations where the baseline conditions or requirements were changed (such as production level changes), the baseline equipment is defined as the minimum equipment needed to meet the revised conditions. If the pre-existing equipment is not capable of reliably meeting the new requirement (such as production change) for its remaining life, then a new equipment baseline must be established utilizing either minimum code requirement or industry standard practice equipment, whichever is applicable.

Industry standard practice baselines are established to reflect typical actions absent the program

Industry standard practice baselines establish typically adopted industry-specific efficiency levels that would be expected to be utilized absent the program. Standard practice determination must be supported by recent studies or market research that reflects current market activity. Typically market studies should be less than five years old; however this guideline is dependent on the rate of change in the market of interest relative to the equipment in question. For example, the lighting markets may change significantly in the next two years while larger process equipment markets might change more slowly. Regulatory changes might

cause very rapid market practice shifts and must also be considered. For example, forthcoming changes in Federal Standards relating to linear fluorescent lighting system and components will likely result in rapid market shifts of equipment use.