

# **ATTACHMENTS A - B**

**ATTACHMENT A**

Summary of Final Determinations of Non-DEER *Ex Ante* Energy Savings Values for High Impact Energy Efficiency Measures for Utility 2010-2012 Portfolios

In April and May of 2010 Energy Division reviewed the workpapers summarized below for high impact measures (HIMs) identified by 1) Energy Division review of IOU E3 compliance filings, or 2) lists of “consensus HIMs” provided by the utilities. The comprehensive archive containing all related files to the initial Energy Division review can be downloaded from the following link:

<ftp://ftp.deeresources.com/pub/WorkpaperReview/10-12Phase1/NonDEERWorkpaperReviewPhase1.exe>.

At the time this review was completed, Energy Division approved two of the non-DEER HIM workpapers.

In January 2011, Energy Division and the utilities further reviewed possible areas of agreement. Energy Division published the final results of this set of reviews. Utilities and other parties provided comments. After the final review and comment period, Energy Division identified 28 workpapers where consensus on all ex-ante values had been achieved, out of a total of 70 reviewed HIM workpapers.

Table 1 lists the consensus workpapers with all of agreed workpaper revisions. Table 2 lists the non-consensus workpapers with all of Energy Division’s final determinations for each workpaper.

| <b>Table 1: Consensus Workpapers</b>              |   |
|---|---|
| <b>Workpaper</b>                                  | <b>Recommendations</b>  |
| PGE PGECOREF101<br>Night Covers for Display Cases | Not subject to Phase 1 review. In consultation with the utilities Energy Division has determined that this measure is not likely to become a HIM and thus this workpaper review is being withdrawn and this work paper is moved into the group of non-HIM workpapers. |
| SCE WPSCNRRN0011<br>Evaporator Fan Motors         | Not subject to Phase 1 review. In consultation with the utilities Energy Division has determined that this measure is not likely to become a HIM and thus this workpaper review is being withdrawn and this work paper is moved into the group of non-HIM workpapers. |
| PGE PGECOCOM102<br>Energy Star Computers          | Approval upon inclusion of the following revisions:<br>1. Consideration of HVAC interactive effects.  |

| <b>Table 1: Consensus Workpapers</b>     |   |
|--|---|
| <b>Workpaper</b>                         | <b>Recommendations</b>  |
|  | Energy Division and utilities held a conference call in January 2011. As a result of discussions in that call, Energy Division believes PG&E is addressing all recommendations in a revised workpaper.  |
| PGE PGECOCOM104<br>Energy Star Monitors  | Approval upon inclusion of the following revisions:<br>1. Consideration of HVAC interactive effects.<br><br>Energy Division and utilities held a conference call in January 2011. As a result of discussions in that call, Energy Division believes PG&E is addressing all recommendations in a revised workpaper.  |
| PGE PGECOALL101<br>Occ Sens Power Strips | Approval upon inclusion of the following revisions:<br>1. Revise NTGR to 0.70<br>2. Revise EUL to 8 years<br>3. Consideration of HVAC interactive effects<br><br>Energy Division and utilities held a conference call in January 2011. As a result of discussions in that call, Energy Division believes PG&E is addressing all recommendations in a revised workpaper.   |
| PGE PGECOBLD101<br>Attic Insulation      | Approved  |
| PGE PGECOBLD105<br>Wall Insulation       | Approved  |
| PGE PGECOPUM102<br>Pool Pump             | Approve PG&E workpaper uploaded to Basecamp on 7/16/2010.   |
| PGE PGECOHVC133<br>Evaporative Cooling   | Not subject to Phase 1 review. After further review of expected accomplishments provided by utilities, ED determined this measure is not a HIM.   |
| PGE PGECOHVC134<br>Whole House Fan       | Not subject to Phase 1 review. After further review of expected accomplishments provided by utilities, ED determined this measure is not a HIM.   |
| PGE PGECOHVC104<br>Pipe Insulation       | Approval upon inclusion of the following revisions:<br>1. Specific language should exclude the application of this measure to hot water piping or tanks covered by current Title 24 and OSHA standards.<br>2. Modify program description to exclude the replacement of damaged existing insulation as the heat loss of a system with damaged insulation is unknown.<br>3. (Pipe insulation) Revise the assumed pipe diameter for pipe greater than 1" from the assumed 2" to 1.7".<br>4. Insulation conductivity should be based on the assumed operating temperature of the steam or hot water.<br>5. The average fluid temperature of the hot water cases should be changed from 160°F to 150°F.<br>6. The 15 year tank insulation EUL recommended by PG&E for tank |

| <b>Table 1: Consensus Workpapers</b>  |   |
|---|---|
| <b>Workpaper</b>  | <b>Recommendations</b>  |
|   | <p>insulation (PG&amp;E Work Paper Tank Insulation PGECOPRO103) should also be used for pipe insulation.</p> <p>Energy Division and utilities held a conference call in January 2011. As a result of discussions in that call, Energy Division believes PG&amp;E is addressing all recommendations in a revised workpaper.</p>  |
| PGE PGECOHC103<br>Hot Water Tank Insulation   | <p>Approval upon inclusion of the following revisions:</p> <ol style="list-style-type: none"> <li>1. Specific language should exclude the application of this measure to hot water piping or tanks covered by current Title 24 and OSHA standards.</li> <li>2. Modify program description to exclude the replacement of damaged existing insulation as the heat loss of a system with damaged insulation is unknown.</li> <li>3. Insulation conductivity should be based on the assumed operating temperature of the steam or hot water.</li> <li>4. The average fluid temperature of the hot water cases should be changed from 160°F to 150°F.</li> </ol> <p>Energy Division and utilities held a conference call in January 2011. As a result of discussions in that call, Energy Division believes PG&amp;E is addressing all recommendations in a revised workpaper.</p> |
| PGE PGECOLTG134<br>Fixture Integrated Occ Sens<br><150 Watts                            | <p>Approval upon inclusion of the following revisions:</p> <ol style="list-style-type: none"> <li>1. Savings calculations revised to be per controlled fixture watt</li> <li>2. Energy savings from the workpaper should be limited to those buildings not already covered in the DEER05 update.</li> </ol>   |
| PGE PGECOLTG135<br>Fixture Integrated Occ Sens<br>≥150 Watts                            | <p>Approval upon inclusion of the following revisions:</p> <ol style="list-style-type: none"> <li>1. Savings calculations revised to be per controlled fixture watt</li> <li>2. Energy savings from the workpaper should be limited to those buildings not already covered in the DEER05 update.</li> </ol>   |
| SCG<br>SDGESCWP100303B<br>Low Flow Shower Head  | <p>Energy Division approves revised workpaper for low-flow showerheads uploaded to Basecamp on 1/20/2011.</p>   |
| SCG<br>SDGESCWP100309A<br>Thermostatic Restrictor Valve                                 | <p>Revised workpaper uploaded on 1/21/2011 includes revision of primary water heating efficiency. ED recommends approval if revised recommendation on tub/shower combinations is also incorporated.</p> <ol style="list-style-type: none"> <li>1. Reduce UES of measure by 20% to account for some installations in tub+shower combinations.</li> </ol>   |
| PGE PGECODHW113<br>Low-Flow Showerhead, Low-<br>Flow Showerhead<br>w/Thermostatic Valve | <p>Approval upon inclusion of the following revisions:</p> <ol style="list-style-type: none"> <li>1. Reduce baseline water consumption to levels supported by current available research, which will reduce savings. DMQC calculations for SDG&amp;E and SCG show that baseline gas use for shower+bath lav+kitchen sink is greater than reported in RASS for all DHW enduses.</li> </ol>   |

| <b>Table 1: Consensus Workpapers</b>  |  |
|---|--|
| <b>Workpaper</b>  | <b>Recommendations</b>   |
|   | <ol style="list-style-type: none"> <li>2. Use water heater recovery efficiency to calculate energy use instead of energy factor.</li> <li>3. Reduce UES of measure by 20% to account for some installations in tub+shower combinations.</li> </ol> <p>Energy Division and utilities held a conference call in January 2011. As a result of discussions in that call, Energy Division believes PG&amp;E is addressing all recommendations in a revised workpaper.</p>   |
| PGE PGECOFST100<br>Combination Oven<br>PGE PGECOFST103<br>Griddles<br>PGE PGECOFST109<br>Rack Ovens<br>PGE PGECOFST112<br>GTO Production Line<br>PGE PGECOFST114<br>Large Vat Fryer<br>PGE PGECOFST115<br>Flexible Batch Broiler<br>SCG SCGWP080630A<br>Flexible Batch Broiler<br>PGE PGECOFST117<br>Conveyor Oven<br>SCG SCGWP080331B<br>Conveyor Oven | <p>Not subject to Phase 1 review. After further review of expected accomplishments provided by utilities, ED determined these measures are not HIMs.</p>   |
| PGE PGECOAGR110<br>Wine Tank Insulation<br>SDGEWPSDGENRL019<br>Wine Tank Insulation   | <p>Approval upon inclusion of the following revisions:</p> <ol style="list-style-type: none"> <li>1. Revise Base Case thermal properties of the tank to have an emissivity of 0.08 instead of 0.8.</li> <li>2. Current cooling system efficiency is likely the lowest that would be encountered. Revise the assumed refrigeration plant efficiency from 1.2 kW/ton to 0.8 kW/ton. Assume the unit is water-cooled, not air-cooled.</li> <li>3. Expand the SPC calculator software to either an hourly analysis, an expanded bin analysis that includes coincident solar and wet-bulb data, or abandon the SPC method for standard energy analysis software.</li> </ol> |

| <b>Table 2: Non-Consensus Workpapers</b>   |  |
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| <b>Workpaper</b>   | <b>Recommendations</b>   |
| PGE PGECOREF103<br>Strip Curtains  | Approval upon inclusion of the following revisions:<br>1. Energy Division recommends general calculation methods be addressed via the recommendation below for adoption of SCE's strip curtain workpaper. Energy Division recommends a more refined calculation procedure be adopted for the next program cycle. Alternatively, ED recommends approval of SCE's workpaper on Strip Curtains "WPSCNRRN0002 Revision 4". Energy Division also recommends that all utilities adopt SCE's workpaper or revise their workpapers to be consistent with SCE's workpaper.  |
| SCE WPSCNRRN0008<br>LT/MT Display Cases<br>w/Doors<br>PGE PGECOREF104<br>LT/MT Display Cases<br>w/Doors<br>PGE PGECOREF112<br>LT/MT Display Cases<br>w/Special Doors | Approval upon inclusion of the following revisions:<br>1. Salvage, disposal or photographic records of replaced equipment should be part of program application requirements when early replacement or open-to-closed case conversion savings are being utilized to ensure the correct baseline is assumed for these measures.<br>2. Display case replacements that are part of large-scale store remodels and any new construction projects should be revised to be custom measures. Large-scale remodels are defined as any project involving 50% of the linear feet of refrigerated casework or 32 linear feet of casework replacements, whichever is less. |
| SCE WPSCNRRN0019<br>Vert Reach-in Display Cases<br>SCE WPSCNRRN0021<br>Horiz Multi Deck Display<br>Cases   | Approval upon inclusion of the following revisions:<br>1. Energy Division believes UES values for Energy Star display case measures should be reduced by 25% to account for a likely higher baseline efficiency than utilized in the Energy Star calculator.   |
| PGE PGECOAPP104<br>Energy Efficient Televisions<br>SCE WPSCREOE0002<br>Energy Efficient Televisions  | Approve PG&E workpaper uploaded to Basecamp on 6/4/2010 for ex-ante values for the 2010 program cycle year. This workpaper adequately addresses the original Energy Division concerns listed below:<br>1. Revision of first year program baseline to consider most recent Energy Star retailer data for non-qualifying appliances.<br>2. Consideration of HVAC interactive effects.  |
| SCE WPSCREHC0001<br>Room Air Conditioners<br>SDGEWPSDGEREL1060<br>Room Air Conditioners  | Approval upon inclusion of the following revisions:<br>1. Require capacity and rated efficiency in rebate application to facilitate future tracking and EM&V efforts.<br>2. IOUs cooperatively develop uniform incremental costs.<br>3. Revise extrapolated energy estimates to be based on RASS room AC UECs by climate zone, or mapped to DEER single family central AC results by climate zone.   |
| PGE PGECOPRO102<br>Steam Trap Replacement<br>SCE<br>SDGESCGWP100310A<br>Steam Trap Replacement   | Approval upon inclusion of the following revisions:<br>1. Large industrial steam trap replacement programs should be handled as custom projects because of the variability in hours of operation, pressure and steam trap size.<br>2. An adjustment should be made to the assumed operating pressures used to estimate leaking steam trap losses to account for the presence of control valves. A 0.67 multiplier is   |

| <b>Table 2: Non-Consensus Workpapers</b>       |  |
|--|--|
| <b>Workpaper</b>                               | <b>Recommendations</b>   |
|  | recommended.   |
| SCG<br>SDGEWPSDGENRL1006<br>Pipe Insulation    | <p>Per request of Sempra, Energy Division reviewed the workpaper in January, 2011. Energy Division recommends approval upon inclusion of the following revisions:</p> <ol style="list-style-type: none"> <li>1. Specific language should exclude the application of this measure to hot water piping covered by current Title 24 and OSHA standards.</li> <li>2. Modify program description to exclude the replacement of damaged existing insulation as the heat loss of a system with damaged insulation is unknown.</li> <li>3. Revise the assumed pipe diameter for pipe greater than 1" from the assumed 2" to 1.7".</li> <li>4. Revise boiler efficiencies to be combustion efficiency estimates rather than overall boiler efficiency. Changes should account for smaller boilers as well as errors in the CEC boiler database. Steam boilers should assume a combustion efficiency of 83% as found in the 06-08 EM&amp;V effort for steam trap replacements.</li> <li>5. The actual value of pipe insulation used in analyses should be provided in the working paper write-up. The assumed pipe insulation conductivity should be based on the assumed operating temperature of the steam or hot water.</li> <li>6. Jacket properties (paper or metal) should be an average based assuming 50% of each type of jacket.</li> <li>7. Hot water process temperatures differ in Tables 2 and 3. The 150°F value is seen as appropriate.</li> <li>8. One would expect that savings values for fittings would be a consistent fraction of that for piping insulation for a given pipe size (only variable that changes between the fitting and pipe calculations would be the assumed surface area). It is not. Recommended savings values are included in the workbook "SDGE_Fittings_Insulation.xls."</li> <li>9. A sink temperature of 65°F is not reasonable for indoor locations. Revise calculations based on a 75°F sink temperature.</li> </ol> |
| PGE PGECOAGR101<br>Greenhouse Thermal Curtains | <p>Approval upon inclusion of the following revisions:</p> <ol style="list-style-type: none"> <li>1. DEER UES values may be used only under the following conditions: <ol style="list-style-type: none"> <li>a. greenhouse must be equipped with an overhead heating system</li> <li>b. not combined, or installed in a greenhouse, with IR film</li> </ol> </li> <li>2. The following UES adjustments are recommended: <ol style="list-style-type: none"> <li>a. UES values reduced by 37% when installed in greenhouse with heating system other than overhead</li> <li>b. UES values reduced by 20% when combined with heat curtains or installed in a greenhouse with existing IR film</li> </ol> </li> </ol>  |
| PGE PGECOAGR102<br>Greenhouse IR Film          | <p>Approval upon inclusion of the following revisions:</p> <ol style="list-style-type: none"> <li>1. DEER UES values may be used only under the following</li> </ol>   |

| <b>Table 2: Non-Consensus Workpapers</b>  |  |
|---|--|
| <b>Workpaper</b>  | <b>Recommendations</b>   |
|   | <p>conditions:</p> <ul style="list-style-type: none"> <li>a. greenhouse must be equipped with an overhead heating system</li> <li>b. not combined, or installed in a greenhouse, with thermal curtains</li> </ul> <p>2. The following UES adjustments are recommended:</p> <ul style="list-style-type: none"> <li>a. UES values reduced by 61% when installed in greenhouse with heating system other than overhead</li> <li>b. UES values reduced by 20% when combined with heat curtains or installed in a greenhouse with existing heat curtains</li> </ul>   |
| <p>PGE PGECOFST101<br/>Convection Oven</p> <p>SCG SCGWP080331B<br/>Conveyor Oven</p> <p>PGE PGECOFST102<br/>Fryer - Electric and Gas</p> <p>PGE PGECOFST104<br/>Steam Cookers</p> | <p>Approval upon inclusion of the following revisions:</p> <ol style="list-style-type: none"> <li>1. Energy Division believes that operating hours, food production rates and baseline efficiencies contribute to overly optimistic UES calculations and recommend a 30% reduction in UES values for this group of measures.</li> </ol>  |
| <p>PGE WPSCREL G0001<br/>Exterior screw-in CFL</p>  | <p>Approval upon inclusion of the following revisions:</p> <ol style="list-style-type: none"> <li>1. The multi-family common area operating hours should be revised to match observations from 0608 Residential Retrofit evaluation.</li> <li>2. Average operating hours should be based on 0608 Upstream Lighting Program and Residential Retrofit evaluation results that show slightly higher exterior screw-in cfl use in single family applications (compared to 05 KEMA lighting study), but much lower usage for multi-family common areas (compared to HMG report).</li> </ol>   |
| <p>PGE WPSCREL G0007<br/>Exterior CFL Fixture</p>   | <p>Approval upon inclusion of the following revisions:</p> <ol style="list-style-type: none"> <li>1. The multi-family common area operating hours should be revised to match observations from 0608 Residential Retrofit evaluation.</li> <li>2. Revise code description to reflect T24 requirements that exterior fixtures in residential applications are required to be either high efficacy luminaires or have photosensor AND motion control.</li> <li>3. Average operating hours should be based on 0608 Upstream Lighting Program and Residential Retrofit evaluation results that show slightly higher exterior screw-in cfl use in single family applications (compared to 05 KEMA lighting study), but much lower usage for multi-family common areas (compared to HMG report).</li> </ol> |
| <p>SCG<br/>SDGE SCGWP100303A<br/>Therm Saver Kit</p>  | <p>Approval upon inclusion of the following revisions:</p> <ol style="list-style-type: none"> <li>1. Reduce baseline water consumption to levels supported by current available research, which will reduce savings. Energy Division calculations for SDG&amp;E and SCG show that baseline gas use for shower+bath lav+kitchen sink is greater than reported in RASS for all DHW enduses.</li> </ol>   |

| <b>Table 2: Non-Consensus Workpapers</b>  |   |
|---|---|
| <b>Workpaper</b>  | <b>Recommendations</b>  |
|   | 2. Use water heater recovery efficiency to calculate energy use instead of energy factor.   |
| SCE WPSCNRLG0086.2<br>Linear Fluor. Interior Fixture<br>SCE WPSCNRLG0087.2<br>Linear Fluorescent<br>SCE WPSCNRLG0092.1<br>Fluor. Lamp to Fluor. Lamp<br>SCE WPSCNRLG0095.2<br>Fluorescent De-lamping<br>PGE PGECOLTG114<br>Linear Fluor. Interior Fixture<br>PGE PGECOLTG116<br>Low/Red. Wattage T8 Lamps<br>PGE PGECOLTG122<br>T8/T5 Lin. Fl. Lamps w/elec<br>bal.<br>PGE PGECOLTG132 R1<br>Permanent T12 De-lamping<br>PGE PGECOLTG159<br>Lin. Fluor. w/NEMA Prem Bal<br>SDGE SDGEWPNRL0044<br>Linear Fluor. Interior Fixture<br>SDGE WPSDGENRL0120<br>T8 32w Lin Fluor Repl w/T8<br>28w or 25w | Approval upon inclusion of the following revisions:<br>1. Establish second baseline for early retirement measures based on currently enacted codes and standards that will be in effect at the end of the RUL.<br>2. Establish code baselines for ROB based on 2008 DEER code baseline mappings as well as current and incoming federal standards, Title 20 requirements and Title 24 Section 146.<br>3. Determine different baselines for each delivery mechanism. Direct install and energy service companies may have a very high level of early retirement and the post-RUL baseline will include a mixture of spaces that are and are not subject to Title 24 Section 146. Other downstream rebate mechanisms should have lower early retirement applications and will also have a mixture of spaces that are and are not subject to Title 24 Section 146.<br>4. Specify costs for code baseline fixtures for all lamp-plus-ballast and fixture replacement measures based on 2008 DEER code baseline mappings as well as current and incoming federal standards, Title 20 requirements and Title 24 Section 146.<br>5. For all fixture replacement measures, if the measure is limited to projects not covered by Title 24 Section 146, require the submission of pre and post lighting construction documents that clearly identify all enclosed spaces and which fixtures have been replaced.<br>6. Revise savings calculations for early retirement so that savings are based on full, above customer average reduction in fixture watts for the RUL and only above code reduction in fixture watts for the period equal to EUL minus RUL. This is consistent with requirements in the Energy Efficiency Policy Manual. For all fixture replacement measures covered by Title 24 Section 146, these baseline fixtures are described in Measure Code Implications, section 3.2, above. For lamp-plus-ballast retrofits, the combination of incoming ballast and lamp efficacy requirements will require electronic ballasts and T8 lamps.<br>7. Determine interactive effects that are consistent across all IOUs that consider air-conditioning and space heat type saturations using one of the following methods:<br>7.1. The adjustment mechanism included in the workbook published for the 2010-2012 decision (posted along with this document). Note that this workbook includes adjustments for residential building types only and must be adapted to nonresidential building types.<br>7.2. The interactive effects workbook published by the CPUC with the final 2006-2008 EM&V results (posted along with this document)<br>7.3. Another method agreed to by all IOUs that determines |

| <b>Table 2: Non-Consensus Workpapers</b>   |  |
|--|--|
| <b>Workpaper</b>   | <b>Recommendations</b>   |
|  | <p>interactive effects based on saturations of air conditioning systems and space heat type.</p> <p>7.4. The workbook “Lighting Interactive Effects - 26Jan2011.xls” to Basecamp on 1/26/2011.</p> <p>8. Revise peak demand calculations for early retirement so that savings are based on full, above customer average reduction in fixture watts for the RUL and only above code reduction in fixture watts for the period equal to EUL minus RUL. This is consistent with requirements in the Energy Efficiency Policy Manual. For all fixture replacement measures covered by Title 24 Section 146, these baseline fixtures are described in Measure Code Implications, section 3.2.</p> <p>9. Revise peak demand calculations for ROB applications to reflect applicable code requirements at the time of replacement.</p> <p>10. Revise whole building peak demand calculations to consider saturations of air-conditioning systems and space heat type.</p> <p>11. Revise all early retirement calculations to be divided into two segments: RUL (one-third of the EUL) and EUL minus RUL (two-thirds of EUL).</p> <p>12. For SDG&amp;E workpapers, revise EUL to use the same basis as PG&amp;E and SCE workpapers.</p> <p>13. Develop costs for fixtures, lamps and ballasts that are not included in 2008 DEER that are consistent across all IOUs or provide additional data or analysis that supports variation in costs between IOUs.</p> |
| <p>SCE WPSCRELG0017.4<br/>Upstream Screw-in CFL</p> <p>SCE WPSCNRLG0072<br/>Upstream Special Screw-in CFL</p> <p>SCE WPSCNRLG0075.1<br/>Plug-in CFL Lamps</p> <p>SCE WPSCNRLG0099<br/>Downstream Screw-in CFL</p> <p>PGE PGECOLTG103<br/>Downstream CFL Reflector</p> <p>PGE PGECOLTG107<br/>Upstream Screw-in CFL(Res)</p> <p>PGE PGECOLTG111<br/>Upstream Screw-in CFL(NRes)</p> <p>PGE PGECOLTG156<br/>Downstream CFL Companion</p> | <p>Approval upon inclusion of the following revisions:</p> <p>1. Revise operating hours for multi-family common areas based on the 2008 DEER values for hotel or motel corridor.</p> <p>2. Use gross savings adjustments based on 2004-2005 or 2006-2008 evaluations. The ED/DMQC has prepared a table that summarizes gross savings adjustments by measure group, IOU and evaluation cycle and uploaded it with this review.</p> <p>3. Revise residential/nonresidential based on the 2006-2008 Upstream Lighting Program (ULP) evaluation or to 95 percent vs. 5 percent based on decision D.09-09-047 (i.e., OP15g).</p> <p>4. Determine interactive effects that are consistent across all IOUs that consider air-conditioning and space heat type saturations using one of the following methods:</p> <p>4.1. The adjustment mechanism included in the workbook published for the 2010-2012 decision (posted along with this document). Note that this workbook includes adjustments for residential building types only and must be adapted to nonresidential building types.</p> <p>4.2. The interactive effects workbook published by the CPUC with the final 2006-2008 EM&amp;V results (posted along with this document)</p>   |

| Table 2: Non-Consensus Workpapers  |   |
|--|---|
| Workpaper  | Recommendations   |
|  | <p>4.3. Another method agreed to by all IOUs that determines interactive effects based on saturations of air conditioning systems and space heat type.</p> <p>4.4. The workbook “Lighting Interactive Effects - 26Jan2011.xls” to Basecamp on 1/26/2011</p> <p>5. Revise whole building peak demand calculations to consider saturations of air-conditioning systems and space heat type. (Refer to recommendation 5, above for calculation method alternatives.)</p>   |
| <p>SCE WPSCREAP0007.3<br/>Recycling of Appliances<br/>Preventing Continued Use</p> | <p>Approval upon inclusion of the following revisions:<br/><i>(NOTE: Energy Division believes that gross saving must be established based upon the difference between the recycled unit energy use, if left on the grid rather than being recycled, and any unit that is placed into service in place of the recycled unit. Energy Division believes that in some situations no unit is placed into service in place of the recycled unit and thus the recycled unit UEC equals the savings, UES. The utilities believe the only probable case that should be considered is the case where UEC and UES are equal and that all other cases should not be considered. However, Energy Division believes that in many instances another unit is placed into service in place of the recycled unit thus causing a reduction in the savings from preventing the recycled unit from staying in service. The overall effect of the recommended Energy Division gross savings adjustment is approximately a 40% reduction in savings.)</i></p> <ol style="list-style-type: none"> <li>1. Include in the measure definition the effects of interceding in the market for used appliances and how that changes available choices to customer who acquire used and new refrigerators. This will cause the measure case gross savings to be a non-zero value. (The current workpaper measure definition has measure case as zero energy use, therefore making the unit energy savings (UES) equal to the unit energy consumption (UEC).)</li> <li>2. Revise UES calculations to be based upon in-situ energy use by climate zone, rather than statewide or utility-wide UES values reported in evaluations, using one of the following methods:             <ol style="list-style-type: none"> <li>2.1. Apply in-situ multipliers from the workbook, “Appliance_InSitu_Weighting-100520a.xls” (posted along with this document)</li> <li>2.2. Use direct enduse UES values from the most recent residential impacts workbook, “DEER2010-2012ResidentialImpacts v1_3.xls” (posted along with this document)</li> <li>2.3. Another method agreed to by all IOUs that determines interactive effects based on saturations of air conditioning systems and space heat type.</li> </ol> </li> <li>3. Determine interactive effects that are consistent across all IOUs that consider air-conditioning and space heat type saturations using one of the following methods:</li> </ol> |

| <b>Table 2: Non-Consensus Workpapers</b> |   |
|--|---|
| <b>Workpaper</b>                         | <b>Recommendations</b>  |
|  | <p>3.1. The adjustment mechanism included in the workbook published for the 2010-2012 decision (posted along with this document). Note that this workbook includes adjustments for residential building types only and must be adapted to nonresidential building types.</p> <p>3.2. The interactive effects workbook published by the CPUC with the final 2006-2008 EM&amp;V results (posted along with this document)</p> <p>3.3. Another method agreed to by all IOUs that determines interactive effects based on saturations of air conditioning systems and space heat type.</p> <p>4. Revise whole building peak demand calculations to consider in-situ performance including HVAC interactive effects, climate zone variability and saturations of air-conditioning systems and space heat type. (Refer to recommendations 2 and 3, above for calculation method alternatives.)</p> <p>5. Revise EUL to the adopted DEER 2.05 RUL of 5 and 4 years respectively for recycling of refrigerators and freezers.</p> |

**(END OF ATTACHMENT A)**

## ATTACHMENT B

### Custom Project Review Process

#### **Energy Division Process for Review of Investor Owned Utility Custom Measure *Ex Ante* Values**

##### **Introduction:**

This document details how the California Public Utilities Commission (Commission) will review the *ex ante* energy savings claims of Investor-Owned Utilities (IOUs) implementing custom measures or projects in the 2010-2012 Energy Efficiency program cycle.

Custom measures and projects are energy efficiency efforts where the customer financial incentive and the *ex ante* energy savings are determined using a site-specific analysis of the customer's existing and proposed equipment, and an agreement is made with the customer to pay the financial incentive upon the completion and verification of the installation. The efforts are by definition unique, each with their own characteristics. Parameters that determine estimated energy savings from a custom measure or project are more variable and less predictable without a site-specific analysis than the more common deemed measures for which savings parameters can be predetermined. As such, it is necessary to establish a clear process by which *ex ante* energy savings estimates from custom measures and projects can be reviewed in real-time as such measures and projects are identified and implemented.

An effective custom measure and project review process balances the needs of program participants who are investors and beneficiaries, the IOUs who administer the programs, and ratepayers who provide incentive funding contingent on adequate oversight of their investment. The process identified here aims to strike that balance. This review process is intended to be applied consistently throughout the program cycle; however, clarification may be made at the discretion of the Assigned Commissioner or Administrative Law Judge.

Chart A of this Attachment includes a graphical schematic depicting the process outlined in this document. In addition, the principles guiding this process and supporting resources are defined herein.

Guiding Principles:

1. Energy savings are the paramount priority of custom measures and projects.
2. The Customer Measure and Project Review Process is intended to allow Energy Division (ED) to review customer projects in parallel with the IOUs, thereby allowing for maximum customer convenience and program oversight.
3. When possible and practical custom measure and project calculation methodologies shall be based upon Database Energy Efficiency Resources (DEER) methodologies as frozen for 2008 DEER version 2008.2.05 or upon methodologies documented within the most current Energy Division reviewed and approved IOU non-DEER deemed workpapers.
4. IOUs are responsible for effective record keeping such that calculation tools, documentation of how those tools were applied to custom measures and projects, and documentation of custom project *ex ante* savings calculations are submitted electronically to the Energy Division.

Supporting Resources:

IOUs are directed to maintain the following supporting resources to enable timely, effective review of custom measures and projects by the Energy Division and their consultants.

**Calculation Tool<sup>1</sup> Archive (CTA):**

Each IOU shall maintain an archive of all generic tools used in calculating *ex ante* values such that they remain accessible to the Energy Division throughout the program cycle.<sup>2</sup> The archive shall contain all versions of all tools used in the development of *ex ante* values for custom measures or projects claimed during the current program cycle. Project specific tools and processes will be stored in the Custom Measure and Project Archive described below.

The tool archive shall include:

- a. All manuals and user instructions, where applicable. If the calculation tool is simply a generic spreadsheet, then all cell formulas and documentation shall be readily accessible from the tool.
- b. A list of technologies, measures or projects for which custom calculations are performed using the tool.

The Calculation Tool Archive shall be updated by the IOUs on an ongoing basis during the 2010-2012 program cycle as tools are revised.

**Custom Measure and Project Archive (CMPA):**

Each IOU shall keep a complete up-to-date electronic archive of all custom measures and projects. Each project should be added to the Archive as soon as possible after either identified in the pre-application stage or the date of the customer's application to the IOU, whichever is earlier. Each project should be assigned a unique identifier that shall not be re-used or re-assigned to other projects.

The IOUs shall provide a summary list of all projects, in pre-application stage and application stage, in their CMPA. Energy Division will provide the utilities

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<sup>1</sup> Tools, in the context of this document, means software, spreadsheets, "hand" calculation methods with procedure manuals, or any automated methods used for estimating *ex ante* values for custom measures or projects.

<sup>2</sup> The Utilities must arrange access to any proprietary tools and software used in the development of *ex ante* values so that Energy Division can perform the review described in this document.

with the format of the summary list. The summary list shall identify each project using its unique identifier and provide a link to the detailed files of each project. The summary list shall also reflect the date of the most recent entry into each project. The summary list shall include for each project the following (Energy Division and the IOUs will work out details of the meaning and specifics of each item below):

- The customer type
- The project type
- Industry Type
- Status (pre-application, application received, application in review, agreement signed, completed, paid, claimed, etc.)
- For pre-application stage projects, a best guess at probability the project will become an application (unknown, very low, low, medium, high, very high; or a percentage probability 0-100% for none to definite) with this status updated as new information becomes available)
- Project location (address)
- Utility contact person (Primary IOU review contact and, if appropriate, primary IOU customer interface contact such as marketing representative)
- Customer segment
- Equipment or process involved
- General description of the proposed project and its energy saving premise
- Estimated *ex ante* energy savings
- the target date when a customer agreement is expected to be issued for customer signature (Agreement Target Date)

The summary list shall be updated at least on the first and third Monday of every month for the duration of the 2010-2012 program cycle, however, the IOU shall provide the updated list more often as necessary to provide Energy Division with information on high priority or fast-tracked applications so as to allow Energy Division to perform reviews of such projects at its sole discretion. The IOUs may provide the summary list by program instead of a consolidated list, should they so desire.

For projects that, within a regular bi-monthly CMPA summary list submission, are projects for which applications have been newly received or projects that have moved from the pre-application state into the application state Energy Division will inform the IOUs of projects which have been selected for review. Such notification shall be before or by the next regularly scheduled CMPA summary list submission. Thus Energy Division will have a minimum of

approximately two weeks to decide if a new application measure or project, either in pre-application or application stage will be subject to review and included into its review “sample.” An IOU may request that a project review decision be expedited for high priority or fast tracked projects and Energy Division will make its best effort to accommodate such requests. If Energy Division chooses not to review a project an IOU may request such a project be included in the Energy Division review sample. Energy Division shall consider such decision change requests but will limit such changes based upon available resources to ensure adequate coverage of the full cycle portfolio of measures and projects in its review sample. An IOU request for Energy Division project review may be accepted, denied or deferred into the Early Opinion process at Energy Division’s discretion, however, Energy Division shall inform the IOU of its decision as quickly as possible.

For each project sampled for a review, the specific types of documents to be maintained in the CMPA and parameters required to be in the supporting documentation may vary based on the type of project. *Examples* of the expected data elements are listed below.

- Documentation to support Baseline assignment (Code or Standard requirement, Early Retirement, Retrofit, Replace On Burnout, industry standard practice, CPUC policy, etc)<sup>3</sup>
- Existing system controls and operating status description
- Existing system output capacities – current output and maximum/design capacity
- Pre-installation inspection report
- Post-installation inspection report
- Proposed modifications with schematic as applicable
- Preliminary savings calculations and supporting data with documentation to ensure replicability
- Manufacturer’s cut sheets when used to estimate *ex ante* savings or when needed to ensure replicability

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<sup>3</sup> The baseline parameters used are of primary importance in estimating project savings. Appendix I of this document provides the guidelines by which Energy Division will review baseline parameter selection.

- Fuel switching considerations and any required analysis per CPUC policy regarding fuel switching projects (see Energy Efficiency Policy Manual)
- Other fuel savings and/or load increases resulting from the project
- Heating, Ventilation, and Air Conditioning (HVAC) interactive effects values and methods used to develop those values, when measures cause a change in HVAC system loads
- Interactions between multiple measures that act to increase or decrease savings relative to a measure stand-alone savings estimate
- Pre/post production output data when used in savings calculations and the source of such records
- Billing history - one-year pre installation, with interval data required when available; when *ex ante* estimated values rely upon a per-unit-production changes based on multi-year production data, corresponding billing histories are required
- IOU or implementer program manual (a single archive of these documents should be referenced rather than including the documents in each project archive)
- M&V plans, reports and raw data archives, where applicable
- EUL/RUL value, analysis or source

Projects Energy Division selects for review will have their complete documentation from the IOU CMPA placed into an Energy Division Review CMPA which, with the Utility Custom Project Summary List, will be housed on an internet-accessible website that meets reasonable security and legal requirements. The Energy Division will be responsible to establishing and maintaining that website.

**Custom Measure and Project Review Process:**

There are two categories of Energy Division's Custom Measure and Project Review Process: general and claims. All reviews are at the Energy Division's discretion; however, if an IOUs *ex ante* values are not reviewed by the Energy Division, the IOU shall rely on those values in making energy savings claims before the Commission after adjusting those values using the gross realization rates as shown in Table 1 below.

| IOU   | kWh                       | kW                        | Therm                     |
|-------|---------------------------|---------------------------|---------------------------|
| PG&E  | <del>0.8</del> <u>0.9</u> | <del>0.8</del> <u>0.9</u> | <del>0.8</del> <u>0.9</u> |
| SCE   | <del>0.8</del> <u>0.9</u> | <del>0.8</del> <u>0.9</u> |                           |
| SDG&E | <del>0.8</del> <u>0.9</u> | <del>0.8</del> <u>0.9</u> | <del>0.8</del> <u>0.9</u> |
| SCG   |                           |                           | <del>0.8</del> <u>0.9</u> |

The **General Review** will include Energy Division’s oversight of the CTA and CMPA. Energy Division, at its discretion, will review tools, measures, and projects, as well as inputs to the tools for selected projects. Energy Division may choose to provide the IOUs with input on one or more of the tools, measures, or projects. The tools reviews will be done on a prospective basis. IOUs shall adjust their subsequent use of the tools to conform to Energy Division input.

The more specific **general project reviews** include a close examination of a selected subset of custom projects.

For all custom applications with *ex ante* values that are not reviewed by the Energy Division, the IOU shall apply an adjustment to the gross savings estimate values using the Default Custom Measure Gross Realization Rates (Table 1) above when making energy savings claims before the Commission.

Energy Division will conduct general project reviews at three stages of the IOU custom project process: concurrent and collaborative pre-installation review, post-installation review, and claim review.

**Pre-Installation Review**

The objective of the Pre-Installation Review is for Energy Division to perform a parallel review, with the IOUs, and then for Energy Division to provide to the IOUs input on the estimated custom measure or project *ex ante* savings. The Pre-Installation Review allows Energy Division to supplement the resources and information available through the CTA and CMPA in making its recommendations.

The IOUs shall provide the Energy Division the opportunity to participate in any site visits, pre-installation inspections, customer interviews, pre-installation M&V, or spot measurements that may occur during this and subsequent phases. If such events are scheduled by IOUs more than five days in advance, the IOU

shall provide notification to the Energy Division within one business day of scheduling the event; the Energy Division should be immediately notified for events scheduled less than five days away. The Energy Division will notify the IOUs prior to the event if they plan to send a representative.

During the Pre-Installation Review, the Energy Division will coordinate any Measurement & Verification (M&V) activities on these custom projects with the IOU. The Energy Division may choose to use the Utilities' or its own contractors, at Energy Division expense, to perform site inspections or pre-installation M&V.

The Energy Division will provide the IOUs with the results of its Pre-Installation Review, including recommended *ex ante* values and documentation to support its recommendation, at least ten days before the Agreement Target Date identified by the IOU in the CMPA summary list. However, the IOU shall provide Energy Division with all CMPA documents in a timely manner such that Energy Division has a reasonable ability to meet this timeline. Energy Division and the IOUs agree to work together to allow timely review of expedited and high priority project. If the Energy Division affirms the IOU's estimated *ex ante* values or suggests values which would result in greater or lower savings than the IOU's estimated *ex ante* values, then the IOU shall rely on those values when entering into estimated incentive agreements for the project and shall also rely on those values for subsequent energy savings claims before the Commission if no further post-installation adjustments are identified by either the IOUs or Energy Division, as described below.

### **Post-Installation Review**

The objective of the Post-Installation Review is to provide the Energy Division with continued opportunity to review and provide input on the accuracy of *ex ante* values assumed by the IOU prior to the utility making its final incentive payment to its customer. The IOU shall allow the Energy Division access to site visits, post-installation inspections, customer interviews, post-installation M&V, or spot measurements. IOU and Energy Division notifications for these events should follow the guidelines described above for Pre-Installation Review. The IOUs shall continue maintenance of the CTA and CMPA in accordance with the direction provided above. If the post-installation M&V inspection results in an IOU adjustment of savings for projects that were reviewed by Energy Division during the pre-installation stage, Energy Division shall have the option to review and approve such adjustments. If, as a result of the post-installation inspection, the Energy Division affirms the IOU's estimated *ex ante* values or suggests values

which would result in greater or lower savings than the IOU's estimated *ex ante* values, then the IOU shall rely on those values for making energy savings claims before the Commission. Otherwise, no deliverables are due to either IOU or Energy Division.

### IOU Claim Review

The IOU Claim Review allows the Energy Division to conduct a review of energy savings for custom projects included into the IOU Quarterly Claim<sup>4</sup> to ensure that:

1. appropriate default realization rates were applied to *ex ante* gross savings estimates for projects that were not reviewed by the Energy Division;
2. recommendations made by Energy Division for reviewed projects were accurately reflected in the claim.

The IOU Claim Review shall commence upon the IOU submittal of a quarterly reporting period claim containing those projects, and end at the later of ninety-days after that submission or the subsequent IOU quarterly submission. Energy Division shall notify the IOU of any errors found in their claim review and the IOU shall comply and revise the claims.

Custom projects that were not reviewed by the Energy Division prior to appearing in a Quarterly claim may be further reviewed for the purpose of gaining new information and prospective improvements to *ex ante* estimates and planning, but IOU's **will not** be held accountable for energy savings adjustments for such reviews for any projects covered by then existing customer agreements or already approved customer applications.

### Resolution of Disagreements:

1. Should Energy Division and a Utility have a technical disagreement on a project's *ex ante* values, Energy Division and the Utility shall meet to discuss and resolve the differences. If the Energy Division recommended *ex ante* value is less than a plus/minus ~~10~~20 percent of the utility estimated *ex ante* value, Energy Division and the utility shall split the difference of

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<sup>4</sup> As a component their energy efficiency portfolio reporting requirements each IOU will submit a quarterly filing on EEGA which includes details of all measure *ex ante* savings values for all individual projects and measures which have been installed prior to that claim.

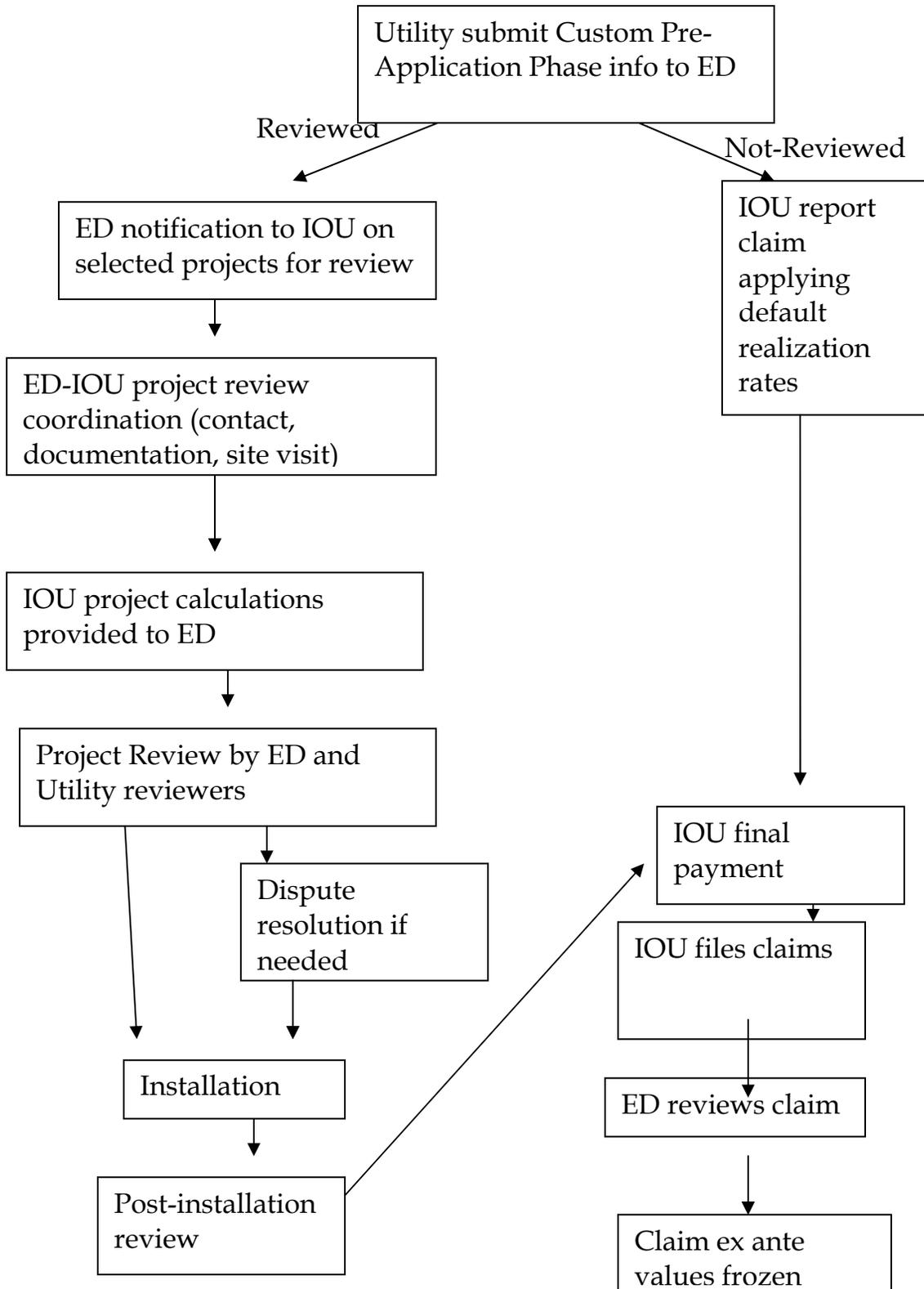
the two values. However, this does not apply if the disagreement is where Energy Division determines that savings will not accrue at all or when a CPUC policy has not been followed. However, in cases where the difference is greater than a plus or minus ~~10~~20 percent, then Energy Division's value will be the frozen *ex ante* value.

**To facilitate future communication:**

Energy Division and the IOUs shall establish a working group to allow an ongoing dialog on the custom measure and project review process. This working group will provide a forum for all parties to exchange information on their current activities and future plan and to discuss and resolve problems and issues with the process outlined in this document. The working group will also provide a forum for Energy Division to inform the IOUs on issues arising in its custom measure *ex ante* estimation review process. These issues may include items such as baseline definitions, net versus gross savings definitions and other items as any party deems necessary. Energy Division will maintain a public archive database of summary of issues identified in its custom applications and projects reviews, and the Energy Division dispositions of those issues. Customer specific data and information will be removed from the Energy Division summary of issues and dispositions.

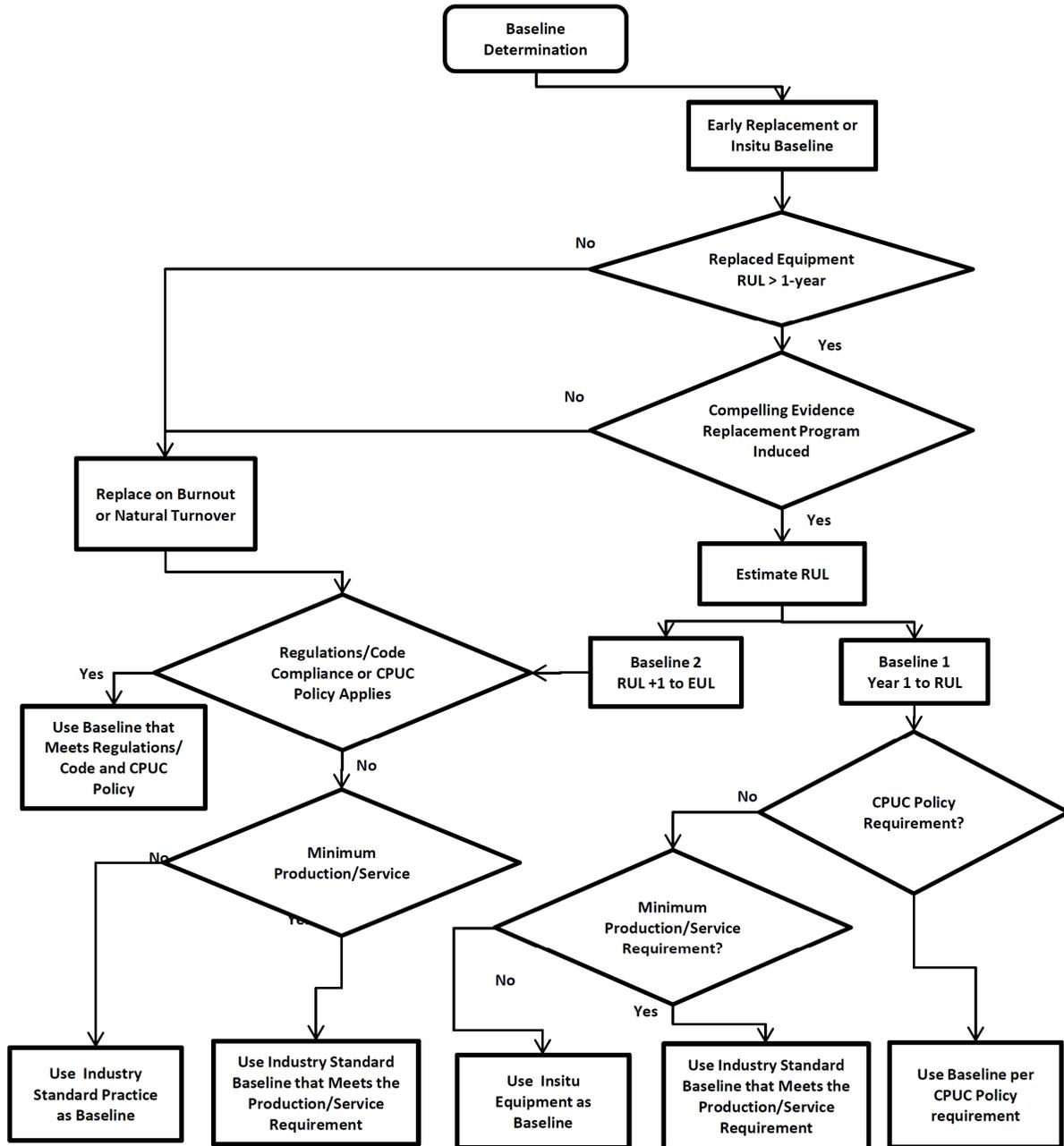
At any time during their development of *ex ante* estimates for a specific custom measure or project the Utilities may submit to Energy Division a request for an early Energy Division review or opinion on a specific issue. This process has been established by Energy Division issuance of the "Custom Measure Early Opinion Process" document posted as "Custom Measure Early Energy Division Opinion Process v2.docx" on basecamp 9/30/2010 in the "Early Opinion Shared" project area. Energy Division shall respond to that request in as expeditious a manner as possible to provide the IOUs with guidance and to allow the Utilities to complete their *ex ante* estimates in a timely manner. However, this type of early guidance shall not limit or constrain any later Energy Division review of *ex ante* claims submitted by the Utilities.

Chart A



Appendix 1

Energy Division Methodology for Determination of Baseline for Gross Savings Estimate



**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, 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<sup>5</sup> 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.**

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 compelling 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

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<sup>5</sup> 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.

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**

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 ballasts will result in rapid market shifts of equipment use.

**(END OF ATTACHMENT B)**

Document comparison by Workshare Professional on Monday, July 11, 2011 11:52:38 AM

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