Attachment A: Summary of Changes to Database for Energy Efficiency Resources 2011

A. Summary of changes to the draft DEER2011 Update proposed by the DEER team in response to party comments.

SCE[1]

1. **Description of Issue:** The reduction in baseline wattage for linear fluorescent fixtures due to the phasing out of older magnetic ballasts does not take in to account the significant existing stocks of these older ballasts. Similarly, the change to calculation of RUL based on lamp life, instead of ballast life that has been historically used, also does not consider significant stocks of older magnetic ballasts.

   DEER team proposed disposition of Issue:

   As discussed in Appendix A-1 of the "DEER Database: 2011 Update Documentation", older or standard magnetic ballasts have been prohibited for commercial applications since 1990. Any standard magnetic ballast still in service in 2013 or later would have been in service for almost twice its expected life in typical applications. The DEER team does not consider the EUL of such ballast as a reasonable choice for the basis of the DEER default RUL of one-third the EUL.

   The revised RUL is based on revisions to federal and state standards that prohibit the shipment of the most commonly applied T12 lamps by July 2012. Since T8 lamps require the use of electronic ballasts, the DEER team believes it is reasonable to revise the RUL to be based on lamp life, which is shorter than ballast life, since, as lamps burn out, both ballast and lamp will need to be upgraded to more efficient equipment. The DEER team also subtracted a year from the RUL calculated based on lamp life to account for the 2013 effective date of DEER and the likelihood that the removed lamps will have been in service for approximately one year. However, the DEER team acknowledges that some customers may have older lamps in storage, which means the one year reduction in RUL would not be applicable.

[1] SCE opening comments at B2-3.

Based upon the above discussion, the DEER team proposes to revise the RUL to be based solely on the nominal lamp life of T12 lamps without subtraction of one year using the formula below as revised from the draft documentation.

RUL = 20,000 hr lamp life / bldg EFLH / 3.

2. **Description of Issue:** SCE is concerned that the development of the lighting profiles developed for residential CFL savings estimates may contain problems related to installation analysis and the use of a sinusoid annualization.

DEER team proposed disposition of Issue:

It is important to note that the CFL installation and operations analysis described in the "DEER Database: 2011 Update Documentation" was only utilized to develop updated annual operating hours for residential CFLs. Utilizing the sinusoidal annualization resulted in slightly higher annual operating hours than not utilizing that approximation. However, when the DEER team examined the CFL usage profiles from the 06-08 residential upstream lighting evaluation lighting logger data those use profiles were found to be similar to those developed for DEER 2008. Therefore, the usage shapes and resultant interactive effects factors from 2008 were retained, and only annual operating hours and coincident demand factors have been updated. The DEER team shares IOU concerns about the development of revised usage profiles and intends to further analyze the 2006-2008 upstream CFL data for the next DEER update.

Based upon the above discussion, the DEER team does not propose any changes at this time in response to the comment; however the issue of updating the residential lighting use profiles using recent metering results will be reconsidered for the next DEER update.

3. **Description of Issue:** The calculation of coincident factor in Appendix A-2-3 appears to not align with the DEER peak demand definition.

DEER team proposed disposition of Issue:

The lighting analysis described in Appendix A-2 of the "DEER Database: 2011 Update Documentation" was not used to revise the unit energy savings (UES) values for nonresidential lighting measures contained in the 2011 DEER Update. As further background, the logger research described in Appendix A-2 resulted in developing individual profiles for each day of the week. While the DEER definition is based on the three day average (or nine total hours), the analysis in

Appendix A-2 averages all five weekdays (or fifteen total hours) since it cannot be known on which the DEER peak demand period falls.

Based upon the above discussion, the DEER team does not propose any changes at this time in response to the comment; however the update of non-residential lighting energy savings parameters utilizing recent metering results, upon which Appendix A-2 is based, will be reconsidered for the next DEER update.

4. **Description of Issue:** The modeling of residential "foliage" appears to be inconsistent across climate zones.

DEER team proposed disposition of Issue:

The calibration process for the residential DEER models uses both thermostat schedules and shading of overall solar gain as variable parameters to create models that match heating and cooling annual energy use targets. The target UEC values vary by climate zone, building type and building vintage and thus the thermostat and solar shading schedules vary by these same parameters. The heating and cooling target values have not been updated since the DEER2008 update.

Only the hottest climate zone (CZ15) required modifications to the default shading schedule; the shading is effectively increased to lower cooling energy requirements. The shading schedules have not changed for the DEER2011 update relative to the DEER2008 values.

Based upon the above discussion, the DEER team does not propose any changes at this time in response to the comment; however the calibration of residential heating and cooling energy use to updated target values will be reconsidered for the next DEER update.

5. **Description of Issue:** Large package air conditioner measures (>= 760 kBtuh) appear to have the incorrect efficiency specified for the code baseline.

DEER team proposed disposition of Issue:

This issue was identified and documented by the DEER team on 12/5/2011 and will be fixed in the update. The Code/Standard Technology for some HVAC measures incorrectly describes the 2005 Title-24 code required technologies instead of the 2008 Title-24 code required technologies. The associated energy impacts are correct, only the code technology *descriptions* are incorrect. The table below provides details of the corrections incorporated into the DEER2011 Update in response to this issue and comment.

Measure ID	Incorrect Code/Standard Technology Description	Corrected Code/Standard Technology Description
NE-HVAC-airAC-Pkg-lt65kBtuh3phs-12p0seer	Pkg AC SEER = 9.70; EER = 9.22; Clg EIR = 0.306; Supply Fan W/cfm = 0.445794; no econo	Pkg AC SEER = 13.00; EER = 11.06; Clg EIR = 0.256; Supply Fan W/cfm = 0.379; no econo
NE-HVAC-airAC-Pkg-lt65kBtuh3phs-13p0seer		
NE-HVAC-airAC-Pkg-lt65kBtuh3phs-14p0seer		
NE-HVAC-airAC-Split-lt65kBtuh3phs-12p0seer	Split AC SEER = 10.00; EER = 9.50; Clg EIR = 0.297; Supply Fan W/cfm = 0.433; no econo	Split AC SEER = 13.00; EER = 11.06; Clg EIR = 0.256; Supply Fan W/cfm = 0.379; no econo
NE-HVAC-airAC-Split-lt65kBtuh3phs-13p0seer		
NE-HVAC-airAC-Split-lt65kBtuh3phs-14p0seer		
NE-HVAC-airAC-SpltPkg-135to239kBtuh-10p8eer	Pkg AC EER = 9.50; Clg EIR = 0.275; Supply Fan W/cfm = 0.419; Cond Fan W/Btuh = 0.0079; w/ econo	Pkg AC EER = 10.80; Clg EIR = 0.262; Supply Fan W/cfm = 0.269514; Cond Fan W/Btuh = 0.00535136; w/ econo
NE-HVAC-airAC-SpltPkg-135to239kBtuh-11p5eer		
NE-HVAC-airAC-SpltPkg-135to239kBtuh-12p0eer		
NE-HVAC-airAC-SpltPkg-240to759kBtuh-10p5eer	Pkg AC EER = 9.30; w/ furnace; w/ econo	Pkg AC EER = 9.80; w/ furnace; w/ econo
NE-HVAC-airAC-SpltPkg-240to759kBtuh-10p8eer		
NE-HVAC-airAC-SpltPkg-240to759kBtuh-9p8eer		
NE-HVAC-airAC-SpltPkg-65to89kBtuh-11p0eer	Pkg AC EER = 10.10; Clg EIR = 0.262; Supply Fan W/cfm = 0.385; Cond Fan W/Btuh = 0.0054; no econo	Pkg AC EER = 11.00; Clg EIR = 0.257; Supply Fan W/cfm = 0.298; Cond Fan W/Btuh = 0.0053; no econo
NE-HVAC-airAC-SpltPkg-65to89kBtuh-11p5eer		
NE-HVAC-airAC-SpltPkg-65to89kBtuh-12p0eer		
NE-HVAC-airAC-SpltPkg-90to134kBtuh-11p0eer		
NE-HVAC-airAC-SpltPkg-90to134kBtuh-11p5eer		
NE-HVAC-airAC-SpltPkg-90to134kBtuh-12p0eer		
NE-HVAC-airAC-SpltPkg-gte760kBtuh-10p2eer	Pkg AC EER = 9.00; w/ furnace; w/ econo	Pkg AC EER = 9.50; w/ furnace; w/ econo
NE-HVAC-airAC-SpltPkg-gte760kBtuh-9p5eer		
NE-HVAC-airAC-SpltPkg-gte760kBtuh-9p7eer		
Note: All energy impacts were correct, only the Code/Std Technology description was wrong		

6. **Description of Issue:** The absence of specialty building types with long operating hours limits the use of DEER to typical buildings and forces specialty buildings to have workpapers or be handled via a custom measure.

   DEER team proposed disposition of Issue:

   At this time only the building types available in DEER may be used for non-DEER workpaper values. does allow the use of the current DEER building types to represent other non-DEER buildings types. However, there is no existing EM&V data to support the claim that the typical building types in DEER should have longer operating hours. However, the utilities may utilize a customized calculation approach in situations where it is desired to use site specific parameters to develop energy savings estimates. The customized approach should be utilized for activities that target a building with operating parameters that are substantially different than the DEER assumptions. However, it is expected that in these cases there will be a M&V plan for measurement activities to support the operating hour claims during the custom project review process.

   Based upon the above discussion, the DEER team does not propose any changes at this time in response to the comment.

7. **Description of Issue:** A small food store building type should be added.

   DEER team proposed disposition of Issue:

   The DEER team agrees that additional building types should be considered for future updates. At this time, however, only the building types available in

DEER may be used. Commission Staff does allow the use of current DEER building types to represent other non-DEER buildings types. For the specific case of *small food store*, it is acceptable to use the DEER Grocery Store building or to use a mixture of building types such as Grocery Store and Small Retail. The utilities may propose equivalent relationships between DEER and non-DEER buildings through the workpaper process. Commission Staff has approved utility proposed relationships in several existing utility workpapers.

The DEER team has added a customized building type weight feature to the READI tool to accommodate the utilities desire to utilize a combination of existing DEER building types to represent a typical composite building type within their program activities. The weights used to create a new building type will be subject to review by Commission Staff; once approved, the new weighted building type will be incorporated into the DEER database and the associated energy impacts will be able to be referenced as DEER impacts.

8. **Description of Issue:** The draft DEER does not address measures that are known to be missing from older versions of DEER such as exterior lighting.

   DEER team proposed disposition of Issue:

   The DEER team has updated the values for residential exterior CFL lighting in the DEER2011 update. There are currently no values for other types of exterior lighting. The utilities must propose values for other types of residential or all non-residential exterior lighting via the submission of non-DEER workpapers.

9. **Description of Issue:** Updated measure load shapes referenced in the Technology Group Sections should be verified and/or adjusted with metering data planned with EM&V work. Alternatively, load shapes could be simplified to reduce mismatches.

   DEER team proposed disposition of Issue:

   The term "load shape" was mistakenly used in Section 4 of the "DEER Database: 2011 Update Documentation" to refer to the usage profiles of luminaires and screw-in CFLs. The DEER team intends the term "load shape" to represent the normalized hourly impact of a measure. The DEER team has revised the DEER documentation accordingly.

   Using the DEER2011 Update impact modeling results, the DEER team has augmented the impact profiles (load shapes) for the following measure cases:

i. Residential central HP
ii. Commercial packaged and split HP
iii. Residential clothes washer and dishwasher
iv. Residential building shell

Using the DEER2011 Update impact modeling results, the DEER team has augmented the impact profiles (load shapes) for the following measure cases:

v. Residential indoor lighting
vi. Residential refrigerator/freezer, indoors
vii. Residential refrigerator/freezer, outdoors
viii. Residential duct sealing
ix. Residential refrigerant charge
x. Residential refrigerant charge + duct sealing
xi. Commercial CFL indoor lighting
xii. Commercial non-CFL indoor lighting
xiii. Commercial chillers
xiv. Commercial split/packaged AC, high efficiency
xv. Commercial split/packaged AC, refrigerant charge
xvi. Commercial split/packaged AC, duct sealing

The DEER team has posted the above listed DEER2011 load shapes on the DEER website DEER2011 for 13-14 page[2]. These load shapes will also be included into the 2013-2014 E3 cost effectiveness calculators made available for use by the utilities in their application filings.

10. **Description of Issue:** The draft DEER does not include a method for utilizing standardized lighting savings methodologies for technologies not included in the current draft.

DEER team proposed disposition of Issue:

In response to this comment and request from the utilities, the DEER team has augmented the DEER2011 database and the READI tool to allow DEER lighting savings methodologies to be utilized to calculate savings for technology combinations (measures) not included in the standard set of DEER measures. This new feature can also be utilized in conjunction with the customized weighting feature described earlier. The technologies used to create a new

[2] *See* http://deeresources.com/DEER2011/download/DEER2011UpdateLoadshapes.zip.

lighting measure will be subject to review by Commission Staff; once approved, the new lighting measure will be incorporated into the DEER database and the associated energy impacts will be able to be referenced as DEER impacts. This new features is described in more detail below.

The energy impacts associated with all DEER2011 lighting measures are scaled based on a single set of energy impacts for each lighting category. The lighting categories are:

i. Commercial indoor general lighting, including linear fluorescent and HID fixtures
ii. Commercial indoor CFL general lighting
iii. Commercial exit lighting
iv. Residential indoor general lighting
v. Residential outdoor lighting

Direct energy and demand impacts (the impacts due to the lighting end-use change only, excluding HVAC interactive effects) for each category vary by building type, building vintage (new, existing, or specific vintage years) and building location. HVAC interactive effects are applied to these direct energy impacts to determine the basis for whole-building energy impacts.

The DEER2011 READI database interface tool provides a means to create new lighting measures based on the existing sets of scalable energy impacts (listed above) combined with the appropriate HVAC interactive effects factors. A proposed new measure definition references a proposed-for-installation lighting technology along with a code baseline lighting technology, and in the case of early retirement, a pre-existing lighting technology. This new measure definition will then be applied to the standard DEER energy impacts and HVAC interactive effects to create a proposed "customized" DEER set of energy impacts. Upon review and approval by Commission Staff, a new "custom" DEER measures, based on the adopted DEER method, will be incorporated in the standard measure list and will be able to be referenced as a DEER measure.

The DEER2011 READI database interface tool also allows for weighting the energy impacts associated with existing building types together to create a new set of energy impacts for the custom weighted building type. The weights used to create the new building type will be subject to review by Commission Staff; once approved, the new weighted building type will be incorporated into the DEER database and the associated energy impacts will be able to be referenced as DEER impacts.

Integral LED lamp technologies present a particular challenge for determining ex ante savings in that the READI tool does not include applicable wattage reduction ratios for these technologies. The DEER team is also concerned that the annual operating hours values currently in DEER (either non-CFL or CFL) may not be representative of operating hours for installed integral LED lamps. At this time Commission Staff is reviewing utility 2010-2012 phase 2 workpaper submissions for LED technologies which include proposals for wattage reduction relationships as well as annual hours of use. Commission Staff is working with the utilities to develop acceptable workpaper values for integral LED technologies. Once approved these workpapers shall apply until these technologies are incorporated into the READI database interface tool via the new measure technology feature described above or are added into the DEER database in the next DEER update.

11. **Description of Issue:** Additional specifications for commercial dX cooling equipment should be added for small units with SEER > 14 and large units with EER > 12.

    DEER team proposed disposition of Issue:

    Technologies representing the higher SEER units have not yet been added for the DEER2011 Update. The DEER team will work with the IOUs to develop a workpaper that includes estimation methods for SEER rated units that meet the latest CEE specifications. Once approved by Commission Staff, these values will be utilized until the next DEER update. The DEER team will address additions needed for the latest CEE specification in the next DEER update.

12. **Description of Issue:** DEER should be subject to some type of "open-book" sensitivity testing of results. Regression approaches should be used to develop savings which would produce more accurate results compared to simulation outputs for every combination of measure, building type, building vintage and climate zone.

    DEER team proposed disposition of Issue:

    The DEER team does not propose any changes at this time in response to the comment; however the DEER team will seek input from parties to determine where and when to use a particular analysis approach from the range of available techniques and to choose approaches that make the most sense given the weight of evidence and requirements for a particular measure or program activity.

PG&E[3]

1. **Description of Issue:** Clarify the correct table of interactive effects and operating hours to be used for non-DEER lighting measures

   DEER team proposed disposition of Issue:

   This issue is addressing a workbook of Lighting HVAC interactive effects that included a reference to an outdated residential lighting hours-of-use. Though this reference did not affect the HVAC interactive effects values contained in the workbook, the workbook was re-published with the corrected lighting hours-of-use on 12-13-2011 and the link provided on the "DEER2011 for 13-14" page of DEEResources.com. (http://deeresources.com/DEER2011/download/LightingHVACInteractiveEffects_13Dec2011.xls) Note that the final tables of DEER Lighting HVAC interactive effects will be impacted by the disposition of NRDC issue #2 below, such that the spreadsheet listed here will be superseded by the final DEER2011 Update version of HVAC interactive effects factors.

2. **Description of Issue:** Clarify which interactive effects should be used for LED lighting measures

   DEER team proposed disposition of Issue:

   The DEER HVAC interactive effects tables contain interactive effects factors based on IOU, building type, building location, building vintage and lighting type. The lighting types are:

   - Non-CFL (for commercial buildings only)
   - Exit fixtures (for commercial buildings only)
   - CFL (for both commercial and residential building types)

   All LED lighting measures that replace existing incandescent or CFL fixtures are to use the HVAC interactive effects for the CFL lighting type.

   All LED lighting measures that replace linear fluorescent or HID lighting fixtures are to use the HVAC interactive effects for the Non-CFL lighting type.

[3] PG&E opening comments at 21-23.

All LED lighting measures that replace existing Exit fixtures are to use the HVAC interactive effects for the Exit Fixture lighting type.

3. **Description of Issue:** DEER should specify that the Code/Standard Field value for a lighting measure be used as a base case for a Replace On Burnout/NEW measure

DEER team proposed disposition of Issue:

The DEER2011 database includes measures that can be utilized for the following measure application types: replace on burnout (ROB) and normal replacement (NR) with both these cases usually referred to as the ROB case; new construction (NC) and capacity expansion (CE) with both these cases referred to as the NC case; early retirement (ER); and early retirement for RUL period only (ERRUL). In the READI database interface tool the "supported applications" field for a measure specifies the cases for which energy impacts are available for the measure. Measures that support ROB, NC, and ER application types have impacts for the above code or above standard practice case. Measures that support ER and ERRUL application types have impacts for the above pre-existing case. The above pre-existing impacts apply for the RUL period and the above code or above standard practice impacts apply to the post RUL period. Measures that only support the ERRUL only have impacts for the above pre-existing case since these measures just meet code or standard practice thus do not have savings that can be claimed in the post-RUL period. For ROB and NC measures the above code or above standard practice impacts apply to the entire EUL.

The DEER team, during the investigations related to this comment, noticed that some measures did not have the proper "supported applications" field setting and additionally some measures did not have the required impacts for the above code or above standard practice case. These issues have been corrected and database revisions have been made to include code baselines as described below by lighting technology class.

- There is a group of linear fluorescent and HID measures in the DEER2011 database where measure and code technologies are identical. These measures were incorrectly identified in the database as "New Construction" and "Replace on Burnout" measures. The DEER team has revised and correctly identified these measures as "Early

Retirement" with savings only for the RUL period. In addition, T5 lamp measures which had negative above-code savings have been revised to remove the negative savings by correctly setting the code base equal to the measure.

- Exit signs in the DEER2011 database did not have code baselines. Exit signs have been covered by federal standards since January 1, 2006, therefore the DEER team added code baselines for all exit sign measures. These measures have been revised to specify the support of "Early Retirement", "New Construction" and "Replace on Burnout" measure application types.
- Some linear fluorescent and HID measures in the DEER2011 database were missing code baselines. The DEER team has added code baselines that are consistent with federal and state (Title 20 and Title 24) standards for these measures.
- There are some 4 foot linear fluorescent, 8 foot linear fluorescent and HID fixtures that do not have federal or state code requirements governing the efficiency of the fixture components. Examples are 3-lamp linear fluorescent ballasts, very high output (VHO) linear fluorescent lamps, and metal halide fixtures less than 150 watts. The DEER team has established code baselines for these fixtures using the same criteria as other covered fixtures.

Note that screw-in CFLs and pin-based CFL fixture retrofits are not covered by code at this time so no code baseline was assigned to these lighting technologies in the DEER2011 update. Additionally, with the exception of Exit Signs, LED technologies are not included in the DEER2011 update. The DEER team expects to more closely examine the appropriate baseline to use for these technologies under alternative installation circumstances during the next DEER update process to identify if alternate "supported applications" should be implemented for these technologies.

The DEER2011 READI database interface tool has been revised to allow the development of custom lighting measures as described under SCE item 10 above. Each lighting technology available to use in describing a new measure will include references to an appropriate code baseline technology to be used in both ROB and NC measure cases. Additionally, for early retirement measures, the

existing technology case shall be used for the RUL period while the code baseline case shall be used for the period following the RUL.

4. **Description of Issue:** DEER needs to specify what value should be used as a base case for a working measure that is retired before it burns out when the life of the measure has exceeded the Remaining Useful Life (RUL) period.

DEER team proposed disposition of Issue:

There are two issues here: first, if equipment retired before it burns out fits the CPUC definition of equipment eligible to be treated, for utilities savings claims purposes, under the early retirement (ER) rules; and second, what savings values to utilize during the early retirement or accelerated retirement (RUL) period.

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.

As noted in the PG&E item 3 above, the DEER2011 database includes measures that can be utilized for the early retirement (ER) and early retirement for RUL period only (ERRUL) cases. Measures that apply for the ER case must have impacts for the above pre-existing case as well as the above code or above standard practice case; the above pre-existing impacts apply for the RUL period and the above code or above standard practice impacts apply to the post RUL

period. Measures that apply for the ERRUL only have impacts for the above pre-existing case since these measures just meet code or standard practice thus does not have savings that can be claimed in the post-RUL period.

5. **Description of Issue:** DEER (or this update) should specify which CDF value should be used when there is no climate zone and vintage variation.

DEER team proposed disposition of Issue:

The exact nature of this issue is ambiguous, so the DEER team provides three alternate directions to be followed in the appropriate cases as described below.

For the case where the whole-building energy impacts for a DEER measure have no climate zone or vintage variation, there will be only one CDF per building type. In this case the location and building vintage will be listed as "any" in the DEER2011 database. As an example, this is the case for residential outdoor lighting measures in DEER.

For the case where the direct energy impacts (end-use impacts not including the HVAC interactive effects) for a DEER lighting measure have no climate zone or vintage variation, whole-building impacts are accounted for via the DEER Lighting HVAC interactive effects tables. The whole building impact including HVAC interactive effects have location (climate) and building vintage variation. If the location and vintage information are know that information should be used to select the correct HVAC interactive effects factors to apply to the direct end-use impact when calculating the whole building energy impacts. For the situations where the climate zone location or building vintage is not known, the climate zone and/or vintage weighted HVAC demand interactive-effects values can be used. The DEER Lighting HVAC interactive effects tables and DEER2011 database impact tables include a location entry for overall "utility service territory" (the "IOU" location) and for a weighted "Existing" vintage (the "Ex" building vintage). The demand factors based on these selections can be used when the location or vintage is not known.

For custom measures and projects the DEER methods for calculating CDF and HVAC interactive effects are to be utilized. When possible and appropriate, based on similarity of a DEER measure to the custom measure or project, DEER values shall be used. As discussed in SCE item 10 above, the READI database interface tool has capabilities to develop new lighting measures as well as customized weighted building types and measures. Custom lighting measures and projects shall utilize these DEER methods and values to the extent possible.

When an appropriate DEER values is not available, the DEER methods shall be utilized to the extent possible. The DEER definition for peak demand savings applies to all deemed and custom measures and projects. DEER CDF values should be used as appropriate, however, the DEER peak demand savings definition can be utilized directly when sufficient site metered data for a custom measure or project is available to accurately estimate the demand reduction during the DEER defined demand period using the DEER peak demand calculation method.

The DEER demand impact is defined as the average demand impact, for an installed measure, as would be "seen" at the electric grid level, averaged over the nine hours, between 2PM and 5PM, during the three consecutive weekday period which contains the highest average temperature during the 12PM to 6PM period for those three days. For analysis using the CEC adopted Title 24 weather files, which are used as the DEER reference weather files, the dates that correspond to this definition, are provided in the DEER documentation. DEER methods utilize the kWh consumed during each hour as representing the average demand for that hour. The DEER method than calculates the average of the nine average demand values for the defined peak period hours. When the peak electric demand savings for a custom measure or project is being determined based upon metering during current weather conditions, the metered data would need to be projected into the DEER reference weather files or the metered data would need to be collected during a period which represents the equivalent conditions as the DEER peak definition. A current weather period which represents the equivalent conditions as the DEER peak definition period may not be the same dates as for the DEER reference files.

6. **Description of Issue:** Since interior residential lighting hours of operation changed, DEER needs to specify what interactive effects should be used to calculate non-DEER residential lighting work papers.

DEER team proposed disposition of Issue:

The DEER team evaluated how the HVAC interactive effects would change based on the new residential lighting impacts hours-of-use. Since the normalized profile of usage did not change significantly, the ratio of whole-building impact to direct impacts (that are referred to as the HVAC interactive effect factors) did not change significantly. For the DEER2011 update, the residential lighting interactive effects have not changed based on lighting hours-of-use.

Note that the final tables of DEER Lighting HVAC interactive effects have been impacted by the disposition of NRDC issue #2 below.

7. **Description of Issue:** For commercial HVAC equipment, the savings impact for package/split AC and HP units still reference EER and does not reflect IEER for part-load operations. DEER should list savings impacts referenced to IEER for this equipment.

   DEER team proposed disposition of Issue:

   DEER values for 2013-2014 shall be based on EER as in previous versions. Additionally, the code baseline shall be based on EER ratings. The DEER team will investigate the development of savings estimates based on IEER for the next DEER update. The utilities may propose, via the non-DEER workpaper process, methods to map between IEER and DEER EER based values for use prior to the time DEER includes IEER based values.

8. **Description of Issue:** For residential HVAC equipment, PG&E recommends the SEER and EER combination for split system AC be revisited and updated. The EER rating of 11.61 for the 16 SEER units appears low. According to AHRI, there are over 6,000 units with 16 SEER and 12 EER combinations. This 11.61 EER and 16 SEER do not match the CEE specifications. The EER and SEER for AC should align with the Heatpump unit (index# 216) which is 12.06 EER and 16 SEER.

   DEER team proposed disposition of Issue:

   The DEER team will work with the IOUs to develop a workpaper that includes estimation methods for SEER rated units that meet the latest CEE specifications. Once approved by Commission Staff, these values will be utilized until the next DEER update.

9. **Description of Issue:** The whole house fan measure is omitted from this version of DEER. PG&E recommends it be added back into DEER.

   DEER team proposed disposition of Issue:

   This measure was included in the DEER2011 database, but was not viewable via the DEER2011 READI database interface tool due to an incorrect label in the Technology Type classification table. This issue has been fixed and the whole house fan measure now appears under the "HVAC – Ventilation and Air Distribution" use category and the "HVAC Technology – Whole House Fan" technology type.

10. **Description of Issue:** The Evaporative Cooler measure (direct, indirect, direct/indirect) impacts on the gas side seem exponentially high. Input parameters used in the Quest DEER modeling should be revisited.

    DEER team proposed disposition of Issue:

    This measure was not updated from DEER2005. The DEER team investigated the simulation methods and software used to develop the 2005 savings estimates and identified issues that are believed to have caused the therm savings results to be incorrectly estimated. Additionally, some of the 2005 DEER building models for the evaporative cooler measure were re-analyzed using the DEER2011 software that includes improvements to the evaporative cooler operations, and the results the re-analysis showed that negative gas impacts were near zero.

    Based upon the above discussion, the DEER team proposes the continued use the existing kWh and kW impacts with the gas impacts set to zero. The DEER2011 database has been updated to reflect this change. This measure shall be updated with the next version of DEER.

11. **Description of Issue:** For the thermostat measure the hotter climate zones (central valley) have huge negative savings impacts on both the kWh and therm savings. PG&E recommends this anomaly be reviewed.

    DEER team proposed disposition of Issue:

    The DEER2011 energy impacts for this measure are carried over from the DEER 2005 energy impacts and were put out for review at that time. The energy impacts are based on the SCE paper "Programmable Thermostats Installed into Residential Buildings: Predicting Energy Saving Using Occupant Behavior & Simulation". This paper describes the analysis of the programmable thermostat measure based on 2004 RASS data for reported thermostat use by occupants with manual thermostats and with programmable thermostats and detailed energy simulation based on the resulting thermostat schedules. No data have been presented to indicate that the basis for this measure needs to be updated. This measure will be reviewed again for the next update and if new information indicates that assumptions or inputs require updating those changes will be incorporated into the next update.

    Based upon the above discussion, the DEER team does not propose any changes at this time in response to the comment; however the issue of updating

the residential thermostat usage assumptions for both baseline calibration as well as the programmable thermostat measure using recent RASS and other survey results will be reconsidered for the next DEER update.

12. **Description of Issue:** The savings differ by Residential HVAC type for the clothes washer measures. If this is a whether dependent measure, DEER should specify how to weight this measure by HVAC system type.

    DEER team proposed disposition of Issue:

    Upon investigation, the DEER team discovered errors in the analysis of residential clothes washers such that domestic hot water (DHW) and dryer energy savings were significantly underestimated. The energy savings results for these measures have been updated to show correct DHW and dryer energy savings. In addition, the results for individual HVAC system types will be weighted based on published DEER HVAC weights to produce results for a "weighted" HVAC type.

13. **Description of Issue:** DEER should specify methodology for the appliance measures posted so that utilities can develop savings for other efficiency levels than those posted (e.g., clothes washers with MEF of 2.4).

    DEER team proposed disposition of Issue:

    Clothes washer efficiency measures require the identification of typical annual energy use values for washing machine energy, dryer machine and heating energy, and DHW energy (if any). These assumptions have been developed by the DEER team and included in the document "ENERGY_2007 Clothes Washers Workbook_4_final.xls". This document has been added to the DEER update website. The DEER team will work with IOUs to develop similar enduse values as well as overall energy savings estimates for higher efficiency clothes washers.

14. **Description of Issue:** DEER should specify the methodology for weighting residential HVAC systems together for each IOU service territory to simplify measure parameters.

    DEER team proposed disposition of Issue:

    The residential HVAC weights were developed as part of the non-DEER ex ante process for the 2010-2012 cycle. The documentation and derivation of the weights that was provided to IOUs during the ex ante review process, however,

was not included into the DEER2011 documentation. The DEER team will take the following action to supply additional information and documentation:

a. The DEER2011 database will be augmented to include HVAC-weighted results for all measures that have impacts for multiple HVAC types.
b. The values used to weight HVAC system types will be added to the DEER database and will be accessible using an updated version of READI.
c. A workbook documenting how the database tables were developed will be published. (DEER2011-Weights-Development.xls)
d. The residential HVAC weights were published on Basecamp in the "2010 ED workbooks" project on 1-27-2011 (https://energydivision.basecamphq.com/projects/4484275/file/70967195/DEER2010-2012ResidentialImpacts%20v1_4.zip)
e. The commercial HVAC weights were published on Basecamp in the "2010 ED workbooks" project on 3-4-2010 (https://energydivision.basecamphq.com/projects/4484275/file/45436342/DEER%20Lighting%20Measure%20Workbook%20-%203Mar2010.zip)

SDG&E[4]

1. **Description of Issue:** Table ES-1 shows an increase in operating hours for residential interior operating hours, but a decrease of 32% in overall savings compared to 2008. This doesn't make sense given that wattage reduction in the current draft is only slightly less than the wattage reduction used in 2008.

   DEER team proposed disposition of Issue:

   This comment points out a typographical error in the "DEER Database: 2011 Update Documentation". The DEER teams has identified and corrected the following typographical errors to the "DEER Database: 2011 Update Documentation".

   a. Page ES-2, Table ES1, first row; the hourly estimates for internal CFL as in the 2011 and 2008 columns were reversed.

[4] SDG&E/SoCalGas opening comments Attachment at 3-4.

b. Page ES-5; Table ES-5, last row, first column add the words "and Specialty" to the first cell in the measure columns. The cell should read " Residential Basic and Specialty CFL's"

c. Page 4-12, Table 4-12 Delta Watts CFLs – Commercial sector. The estimates in the column labeled "2008 Delta Watts" were inadvertently copied from column 4 "Pre Wattage". However, much of the information in this section was NOT utilized in the DEER2011 update; therefore all unused portions of this section have been removed.

d. Page 6-4, Table 6-1, Master Table of NTGR, column 4, NTGR in the 2008 DEER v2.05, all of the commercial and industrial values in this column should be corrected from 0.54 to 0.64.

e. Page 13-2,13-4 and 13-5, Tables 13-1, 13-4 and 13-5, The measure name in the first column is given as Residential Gas Storage/ Instantaneous Water heaters with EF >.62. This description should be replaced with the words "Residential Gas Storage Water Heaters with EF>.62 and EF<=0.65" in all three tables where this measure name is given to describe the characteristics of gas water heaters.

2. **Description of Issue:** The DEER documentation at ES-2 notes that EPACT will prohibit the shipment of most 4 foot and 8 foot T12 lamps as of July 14, 2012. SDG&E specifically asks "Does this mean that there will not be a dual baseline for these measures (T12 fixture retrofits) moving forward?" SDG&E also requests that specific RUL values for linear fluorescent measures be included in DEER.

DEER team proposed disposition of Issue:

See the same issue under SCE item 1 above.

3. **Description of Issue:** Please provide data and references for the energy savings factors (ESF) use in the calculation of savings for low flow showerheads and faucet aerators.

DEER team proposed disposition of Issue:

The DEER team proposes that these measures revert to non-DEER workpaper values that will be updated and submitted with the utilities 2013-2014

applications. All information on energy savings for these measures will be deleted from the DEER2011 Update database and documentation.

EnerNOC[5]

1. **Description of Issue:** Clarify the specific values for lighting hours and coincidence factors in non-residential buildings.

   DEER team proposed disposition of Issue:
   This comment seems to relate to SCE comment 1 above. Appendix A-2 of the "DEER Database: 2011 Update Documentation" was not used to revise the UES values for nonresidential lighting measures contained in the 2011 DEER Update. Refer to Appendix A-1 for all documentation on assumption and method changes that relate to non-residential lighting energy savings values.

2. **Description of Issue:** The draft DEER appears to be missing several specific building types. Clarify if this is an oversight or if these buildings fall into an "other" category.

   DEER team proposed disposition of Issue:
   See SCE comment 7 above. The utilities can propose, via the workpaper process, a new building type composed of multiple existing DEER building types. The READI tool can be used to weight up multiple DEER building type results into a new customized building type.

3. **Description of Issue:** Existing logger data (from 2006-2008 EM&V) used to develop proposed hours may not accurately reflect the number of lighting hours in most non-residential buildings.

   DEER team proposed disposition of Issue:
   See previous comment above. See also SCE comment 6 above.

[5] EnerNOC opening comments at 7-8.

TURN[6]

1. **Description of Issue:** TURN is concerned that non-residential lighting operating hours have not been updated, while the draft DEER documentation states that "the HOU [hours of use] values based on the 2006-2008 evaluations are lower for most building types than those in DEER 2008" which suggest that savings for non-residential lighting measures may be overstated.

   DEER team proposed disposition of Issue:

   The DEER team shares the concern that some of the non-residential lighting usage profiles, hours-of-use and peak coincidence factors may be causing over-estimates for some non-residential lighting measures in situations. Due to time limitations an update for these parameters was not able to be completed for this update. DEER lighting parameters for many non-residential buildings that represent common facilities of participants in the utilities programs were found to be in good agreement with the 2006-2008 evaluation results. Work will continue to analyze the 2006-2008 non-residential lighting data for input into the DEER update process.

   Based upon the above discussion, the DEER team does not propose any changes at this time in response to the comment; however the issue of updating the non-residential lighting kWh, kW and therm values using recent metering results will be reconsidered for the next DEER update.

2. **Description of Issue:** The increase in operating hours for residential exterior CFLs is surprising, especially compared to the decrease (10% increase vs. 32 percent decrease) in operating hours for residential interior CFLs. TURN recommends continued investigation and update.

   DEER team proposed disposition of Issue:

   The DEER team shares the concern that some of the residential lighting usage profiles, hours-of-use and peak coincidence factors may require further examination to insure metering data anomalies are identified and corrected. However, at this time the values used for the DEER2011 Update are considered the best available information and the most appropriate to use.

[6] TURN opening comments at 3-4.

Based upon the above discussion, the DEER team does not propose any changes at this time in response to the comment; however the issue of re-examining the residential lighting metering results to correct for any identified data anomalies will be considered for the next DEER update.

3. **Description of Issue:** For non-early retirement measures (such as replace on burnout and new construction), DEER assumes the basecase is a minimally code compliant technology "whereas it is entirely feasible that current standard practice exceed those standards." TURN recommends investigation of standard practice and that DEER code baselines be revised to standard practice baselines.

   DEER team proposed disposition of Issue:

   For new equipment choices that are subject to existing regulations, codes or standards, current policy (found in Appendix I of D.11-07-030 and updated in this decision) provides that the baseline equipment be determined by the regulation, code or standards requirements. There may be instances where there is sufficient evidence or documentation that the efficiency or energy use of equipment that meets the requirements of the regulation, code or standard does not well represent the efficiency or energy use of typical installed equipment. In those cases it may be appropriate to assign a baseline that better represents the typically installed equipment in place of equipment defined by the regulation, code or standards. There may also be cases when existing regulations, codes and standards are being ignored or circumvented. Thus it may be possible in some cases for the typical baseline performance to lead to higher energy use than would be seen if the regulation, code or standard was correctly followed or adequately enforced. However, at this time the DEER team does not have sufficient reliable quantitative evidence to recommend a change in DEER baseline assumptions.

   Based upon the above discussion, the DEER team does not propose any changes at this time in response to the comment; however the issue of examining evidence that could support moving to a "market typical" baseline for selected measures will be examined during the next DEER update process.

NRDC[7]

1. **Description of Issue:** NRDC states that the proposed estimates of residential interactive effects are substantially higher than in other states.

   DEER team proposed disposition of Issue:
   When the assumptions behind the values used by these other programs are carefully evaluated, the differences can be explained.

Minnesota

Table 1.1 shows the State of Minnesota published HVAC interactive effects factors as calculated by the method of Rundquist[8]. The heating IE Factor in the Rundquist method is proportional to the Perimeter Fraction, which is the proportion of building floor area that lies within 15 feet of an exterior wall. The basis of this calculation is the assumption that the core of the building is in a cooling mode throughout the year, and only the perimeter will experience negative heating interactive effects (heating takeback). The residential building values published for Minnesota make the same building shape assumption as the commercial building, where in reality a residential building would have a much higher Perimeter Fraction. As shown by the alternate calculation in Table 1 the HVAC IE factor for a single family home according to the Rundquist method should be double the value of the commercial building. Moreover, the Rundquist method was developed 19 years ago using a commercial building energy model. The resulting high internal heat gains, the absence of duct heat loss and other factors make this resource questionable as a tool for estimating residential interactive effects, even when appropriate geometry adjustments are made.

[7] NRDC opening comments at 6 and Attachment B at 29.

[8] Rundquist, R., K.F. Johnson, and D.J. Aumann. 1993. "Calculating Lighting and HVAC Interactions," ASHRAE Journal, November 1993.

Table 1 Minnesota Heating HVAC Interactive Effects Factors (Minnesota, 2012a and 2012b)

				Heating Calculations						Cooling Calculations		
	Building Type	Floor L1	Floor L2	Perimeter Fraction	Therm/ kWh	Effic- iency	Fraction heating	IE Factor, Therm/ kWh	Take- back	Fraction Cooling	COP	IE Factor
Published	Commercial	80	150	0.5	0.03413	75%	0.39	-0.0088738	-26%	0.33	3	0.11
Published	Residential	80	150	0.5	0.03413	75%	0.39	-0.0088738	-26%	0.33	3	0.11
Alternate	Residential	30	30	1	0.03413	75%	0.39	-0.0177476	-52%	0.33	3	0.11

Northwest States

The Regional Technical Forum of the Northwest Power and Conservation Council has published a workbook describing energy savings for compact fluorescent lighting in residential buildings. One parameter listed in this workbook is the space heat interaction factor, which is given as 22%. This parameter is actually an electric-only impact for the entire market. Its calculation begins with the change in heating load per unit change in lighting energy for a single building. A factor of 47% is then applied to account for the fraction of heating in the market that is electric, and a divisor of 1.07 is applied to account for the average efficiency of an assumed mix of electric resistance and heat pump systems.

$$\text{Electric Space Heat Interaction} = \left(\frac{\text{Change in Heating Load} \times \text{Electric Heat Market Share}}{\text{Change in Lighting Load} \times \text{Heating Efficiency}}\right) = 22\%$$

In the same workbook, the heating interactive effects factor for a single residence with gas-only heat is listed as -0.0295 Therms of gas per kWh of lighting savings, or 87% heating takeback. This falls right in line with the DEER factors listed in Table 22.

Table 2 DEER 2011 Heating Takeback

IOU	Building Vintage	No Cooling	DX Cooling
PG&E	Existing	-97%	-83%
PG&E	New	-92%	-79%
SCE	Existing	-71%	-71%
SCE	New	-76%	-68%
SDG&E	Existing	-63%	-65%
SDG&E	New	-63%	-65%

Vermont

The Technical Reference User Manual of Efficiency Vermont (2010) indicates the use of the Rundquist method for determination of HVAC Interactive Effects. For residential buildings, the manual shows the fraction of hours in heating to be zero. No rationale is presented in the manual to explain why this was done.

2. **Description of Issue:** NRDC comments on the draft DEER2011 database state that residential HVAC interactive-effects for therms associated with lighting measures have increased from the previous reported values.

DEER team proposed disposition of Issue:

The residential HVAC interactive effects factors changed from the DEER2008 (version 2.05) database to the DEER2011 database due to the documented updates in the residential models and simulation tools. However, none of these updates were expected to cause the gas interactive effects (or "heating take-back") to increase.

The authors of the NRDC comments, in their Attachment B attempted to calculate residential HVAC interactive effects factors for the 2011 DEER release using what they term "DEER simulations". The details of these calculations are not revealed in Attachment B, but the results do not consistently match the actual DEER2011 HVAC interactive effects factors as published. As shown in Table 3 the heating IE Factors for a single family residence increase by less than 1% for existing buildings and decrease by about 5% for new construction.

Table 3 Trends in DEER HVAC Interactive Effects Factors for Single Family Residence

		Heating IE Factor			Cooling IE Factor		
IOU	Building Vintage	2006-2008 Evaluation Appendix B	DEER 2011	Change	2006-2008 Evaluation Appendix B	DEER 2011	Change
PG&E	Existing	-0.0266	-0.0267	0.6%	1.030	1.030	0.0%
PG&E	New	-0.0256	-0.0243	-5.1%	1.058	1.070	1.1%
SCE	Existing	-0.0212	-0.0213	0.7%	1.075	1.080	0.4%
SCE	New	-0.0215	-0.0207	-3.7%	1.100	1.100	0.0%
SDG&E	Existing	-0.0191	-0.0192	0.5%	1.034	1.040	0.6%
SDG&E	New	-0.0208	-0.0194	-6.8%	1.053	1.060	0.7%

Investigation by the DEER team, while researching the NRDC comments, uncovered an error that caused the heating "take-back" for residential lighting measures to be over-estimated due to the inclusion of non-IOU heating fuel in the calculation. The DEER database and support workbooks will be updated with the correct residential HVAC interactive effects factors. Note: none of the results used as input to the HVAC IE factor calculations will change, but the process itself will be corrected to properly account for non-IOU heating fuel.

B. Summary of changes to the draft DEER2011 Update proposed by the DEER team identified during the investigation of party comments or directed by Commission Staff.

1. **How issue was identified:** SCE comments and Commission Staff direction
Description of Issue: There is false precision in the DEER energy impacts due to too many significant digits being reported in the DEER database and calculated results.

DEER team proposed disposition of Issue:

The DEER database interface has been modified to report results with 2 to 3 significant digits. All data written to CSV file (i.e. downloaded from the DEER database using READI) will have 3 significant figures; data shown as "DEER Energy Impact Values" within READI will have 3 significant figures. HVAC interactive effects values for kW and kWh will be rounded to two decimals, therm values will be rounded to two significant figures. Note: data stored in the DEER2011 database tables used to calculated measure impacts may retain a greater number of significant figures; all values reported as DEER energy

impacts will follow the guidance described above.

2. **How issue was identified:** PG&E via direct email on 1-20-2012
Description of Issue: Lighting energy impacts for education buildings are not consistent with reported HVAC interaction factors and reported coincident demand factors.

DEER team proposed disposition of Issue:
An error was identified and documented on the DEER2011 FAQ on 12/14/2011 regarding the coincident demand impacts for education buildings. The DEER database will be updated with the correct coincident demand factors for all education buildings.

3. **How issue was identified:** DEER team review while investigating party comments
Description of Issue: The "existing vintage" energy impacts were calculated by weighting individual building vintage impacts together based on building stock data. This process did not properly account for the latest vintage (built after 2009), causing the reported existing vintage energy impacts to be approximately 2% too high. It was also noted that the energy impact values and the common units values used to normalize the energy impact values were weighted separately. The correct method to weight these values is to calculate the normalized impacts (simulated impacts divided by common units) before weighting the values. This error can cause the normalized weighted impacts to be 2-3% high or low.

DEER team proposed disposition of Issue:
The weighting process has been corrected and the existing vintage energy impacts have been recalculated based on the normalized vintage-specific results. The vintage-specific energy impacts will not be changed, only the process that weights the vintage-specific results into a single "Existing" vintage will be corrected. To accomplish this correction and recalculation all vintage values have been added into the database and the weighting process feature has been added into the READI tool. These additions to the database and the READI tool also enable the DEER team and the utilities to develop new weighted measures for DEER based upon existing DEER measures using customized weighting of those measures. This capability is further described elsewhere in this document.

4. **How issue was identified:** DEER team review while investigating party comments
   Description of Issue: The profile for residential dishwasher measure is not the intended dishwasher profile, but is the same profile utilized for clothes washers.

   DEER team proposed disposition of Issue:

   The usage profile used for the residential dishwasher measures was replaced with an appropriate residential dishwasher usage profile. The DEER2011 database and documentation were updated with new results and descriptions. Note: direct energy impacts for the dishwasher and hot water heater associated with these measures will not change, only the HVAC interaction effects and the peak demand impacts are changed.

5. **How issue was identified: Commission Staff** review of party comments

   Description of Issue: What NTG value should be used for custom measures and projects which include the installation of technologies providing both gas and electric savings.

   DEER team proposed disposition of Issue:

   This discussion applies to custom measures and projects which are implemented at a single site as well as planned and installed as a single project.

   Custom measures and projects which are predominately electric technologies shall use the DEER NTG for custom electric technologies and that NTG shall also be applied to any gas savings that may result as an added benefit from that technology application. Similarly, custom measures and projects which are predominately natural gas technologies shall use the DEER NTG for the custom natural gas technologies and that NTG shall also be applied to any electric savings that may result as an added benefit from that technology application.

   Measures and projects that contain a mix of electric and gas technologies shall have separate NTG values applied to their respective gas and electric savings. These measures or projects can be reported as separate gas and electric claims using the DEER NTG for the respective custom gas and electric technologies. Alternatively, these measures or projects can be reported as a single claim with separate electric and gas NTG values. These separate gas and electric NTG values shall be calculated using the DEER NTG for the respective custom gas and electric technology weighted up into composite gas and electric NTG values

based upon the contribution to gas and electric savings for each measure relative to the total gas and electric savings or all measures. For the weighting calculation, electric savings from gas technologies shall utilize the gas technology NTG and gas savings from electric technologies shall use the electric technology NTG.

6. **How issue was identified:** Commission Staff review of party comments

   Description of Issue: Should DEER NTG values for a single measure have common statewide values? For a single measure, should a single DEER NTG values be applied to kWh, kW, and therm savings and participant costs?

   DEER team proposed disposition of Issue:

   Following Commission direction the DEER team has made two adjustments, as described below, to the draft NTG value tables.

   1) Statewide average NTG values are provided for measures installed using similar delivery approaches for which the variation in the IOU-specific NTG values is twenty percent or less. The statewide average values are calculated by weighting individual measure NTG values by its share in total energy savings.

   2) Whenever possible, based upon the underlying NTG data availability, similar measures are mapped into individual DEER measure NTG table entries based up their predominate technologies being either gas or electric. For example, domestic water heaters will have separate measure specifications for natural gas burners versus electric resistance elements versus electric heat pump technologies. For electric technologies, the measure NTG shall be based upon the kWh NTG value unless the measure is predominately a demand reduction measure. A single NTG value will be provided for each measure NTG table entry and that NTG value shall be applied to the kWh, kw, therm savings and participant cost parameters for that measure when used in a utility claim for that measure.