

# Home Energy Score Data Entry Guidelines

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The following are rules and guidelines for using the Home Energy Scoring Tool and entering the information based on what is observed on site. **These guidelines are in addition and supplementary to the Tool Tips displayed on the Scoring Tool. Be sure to open the Tool Tips on the Scoring Tool - they contain important guidance and information as well.** Correctly interpreting your onsite observations and converting those interpretations into the appropriate data inputs is a critical part of accurately scoring a home. Complex homes will require greater interpretation, for which adherence to these guidelines will be most important – please reference this document whenever you’re unsure as to how you should characterize certain home components in the Scoring Tool. Some of the details in these guidelines only apply to those Assessors who are using the Home Energy Score web interface. If you are using a third party software or app to enter the data, please contact your program Partner for more details about the system you are using.

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## Scoring Tool Do's and Don'ts

- Please do not open the Home Energy Scoring Tool in multiple tabs or log on to the Tool in more than one instance at a time. Doing so may cause an error and the Tool may lock your session.
- The Home Energy Score is appropriate for scoring single family houses and townhouses/row houses/duplexes only. Do not attempt to score mobile homes (manufactured housing) or apartments/multifamily dwellings.
- It is critical that you characterize the Assessment Type properly: select “Initial” for the first session and “Final” for the test-out session. **All other sessions** for the home should be either “Corrected”, “Test”, or “Alternative EEM” (unless it is the “QA” session). Absolutely no home should have more than one “Initial” session, more than one “Final” session, and more than one “QA” session. “Mentor” should only be selected by the experienced Assessor in charge of mentoring a new Assessor scoring their first home.
- Please always complete your scoring session on the same day it was started. Sessions that are left open for more than a day will often not be counted once they're completed. A scoring session should not be initiated if the Assessor does not have the intention of completing it and creating a label the same day. If a session is left open for a few days (especially over a weekend) it should be deleted and the data should be re-entered into a new session.
- Please utilize the **Home Energy Score Assessor Calculator** to determine weighted averages, find values for multiple systems, and calculate accurate equipment efficiencies or defaults. The calculator is provided to each new Assessor as an attachment to your confirmation email, or can be easily obtained by notifying us at [assessor@sra.com](mailto:assessor@sra.com).
- Please use the Tool Tips in the Home Energy Scoring Tool. The Tool Tips are accessed by clicking on the question mark icons available throughout the Tool, and will provide you with important and helpful information regarding each entry or selection. Refer to these guidelines if more clarity is needed.
- Do not share your login or allow others to score homes through your login; doing so will compromise your status as an Assessor and your access to the Scoring Tool may be blocked indefinitely.
- Use correct capitalization when entering the address (avoid using all caps), as it will be displayed in the label the same way it is entered - it should look professional.

## Data Entry Guidelines

### **About This Home**

**Assessment Date** - Enter the date when the assessment inspection was done so that the score reflects the conditions at the time of the inspection.

**Number of bedrooms** – A bedroom is defined as a room purposely built as such and defined as such by local ordinance. If there are more than 10 bedrooms, just enter 10.

**Stories Above Ground Level** – If a house has a level that is 50% or more below grade that level should be characterized as a basement. For example, if half of the lower (walk-out) level of a two level ranch is below grade, the house should be characterized as 1 story, with a basement for the foundation. For houses considered to have a half story above, round up to the next whole number. For example, Cape Cod's are sometimes characterized as 1½ stories; in the Scoring Tool they should be entered as 2 stories, unless the upper ½ story is actually an unconditioned attic. Split level or tri-level homes should often be entered as having two foundations, as follows:

- a.) If there are two full levels on either side of the split, the house is 2 stories and the foundation types will be basement and either crawlspace or slab-on-grade.
- b.) If there are two full levels on one side of the split, one full level (usually over crawlspace) on the other side, and the lowest full level is more than 50% above grade, the house is 2 stories and the foundation types are slab-on-grade and crawlspace – if there is no crawlspace then only one foundation type (slab-on-grade) is necessary.
- c.) If there are two full levels on one side of the split and one full level (usually over crawlspace) on the other side, and the lowest level is more than 50% below grade, the house is 1 story and the foundation types are basement and either crawlspace or slab-on-grade.

**Interior Floor to Ceiling Height** – If there are different ceiling heights, average the heights using a weighted average calculation based on areas, and round to the nearest whole number – the “Averaging Calculator” tab in the **Home Energy Score Assessor Calculator** (aka **Assessor Calculator**) can be used for this. If the calculated average height is exactly between two whole numbers, round up to the nearest whole number. For example, if the average ceiling height is calculated as 8.4 ft., round to the nearest - 8 ft.; however, if the average ceiling height is calculated as 8.5 ft., round up to 9 ft.

**Conditioned Floor Area (all stories combined)** – This must be based on actual measurements done by the Assessor. Measuring the outside dimensions of the house is often a preferred method for calculating floor areas, as long as it can be done accurately. Do not use real estate listings (MLS), appraisals, county records or websites such as Zillow to determine square footage, as these are often inaccurate and/or out of date. Conditioned floor area must include all conditioned spaces that are intentionally heated and/or cooled including conditioned basements, but must not include conditioned

crawl spaces. An area is considered conditioned only if there are duct registers or radiators present. Closets, cupboards, stairwells, and hallways within the conditioned envelope are considered part of the conditioned area. Many auditors have been trained that a basement should be considered conditioned if the ducts and/or HVAC system are in the space, but for Home Energy Score there must be direct delivery to the basement area for it to be considered conditioned (i.e., “unintentionally conditioned” does not count). Do not include commas in the entry.

Direction faced by front of house – Enter the compass direction the house is facing. This can be readily determined with a compass or compass app, or by looking up the home’s address on map software (such as Google Maps) and ascertaining the compass direction.

Air leakage rate – If a blower door test has been conducted on the house and the results are available, enter them as @CFM50. Do not include commas in the entry. If a blower door test result is not entered, the assessor will need to characterize whether the house has been previously air sealed. “Air sealed” means professionally treated to seal or control major air leakage pathways. If it cannot be determined that a house has been professionally air sealed, assume it is not.

### **Roof / Attic 1**

If there is more than one type of roof construction or finish, or more than one type of ceiling, attic, or insulation type, you should enter the information as two roof/attic types by clicking “Enter a second roof / attic”.

Attic area – Attic area is the ft<sup>2</sup> area of the attic only, i.e. the attic footprint. If there is just one attic/roof type, the attic area will be the same size as the upper story floor area you measured while determining the house conditioned floor area, with the exception of cathedral ceilings. If there is more than one roof/attic type, click “Enter a second roof / attic”. Additional fields will be displayed so that the characteristics of a second roof/attic type can be entered – be sure to enter the correct area for each attic. If there are more than two roof/attic types, combine those that are most similar to narrow down the variables to just two and use the “Averaging Calculator” in the **Assessor Calculator** to perform a UA calculation in order to determine the overall insulation R-value of the types that were combined.

Unless the house is single story on slab, crawlspace, or unconditioned basement, the attic area will not be the same as the conditioned floor area. For example, if a single story house has a conditioned basement (directly beneath), the attic ft<sup>2</sup> will be half of the total conditioned area. Do not include eaves or attic spaces over unconditioned areas such as porches or garages. Use the “Floor-Roof Area” checker in the **Assessor Calculator** to verify that your attic area calculation is logical. The total roof/attic area should be at least as large as the total foundation area.

Construction and Exterior Finish - choose the predominant characteristics. If the home’s roof construction or exterior finish is not one of the choices, select the most similar choice.

**Insulation level** – Refers to the roof only, not the attic floor. Provide the nearest R-value from the dropdown menu choices – if there is no insulation in the roof, select R-0. If the attic is vented, any insulation installed at the roof is irrelevant - select R-0. If there are multiple insulation levels, perform a UA calculation (w/ the **Assessor Calculator**) and round to the nearest R-value on the dropdown menu. If a calculated R-value falls halfway between two menu choices, choose the lower value.

**Roof Color** – Choose the color of the roof from the following choices –

- White** = Smooth building material surfaces covered with a fresh or clean, stark white paint or coating.
- Light** = Masonry, textured, rough wood, or gravel surfaces covered with a white paint or coating.
- Medium** = Off-white, cream, buff, or other light-colored brick, bare metal, concrete block, or painted surfaces and white-chip marble-colored roofs.
- Medium dark** = Brown, red, or other dark colored-brick, concrete block, roofs with gravel, red tile, stone, or tan to brown shingles.
- Dark** = Dark brown, dark green, or other very dark-colored painted, coated, or shingled surfaces.
- Cool Color** = If the homeowner knows the reflectivity of the roof, choose cool color and enter the absorptance value, i.e. the inverse of the reflectance.

**Attic or Ceiling Type** – Choose the type from the dropdown menu. If Cathedral Ceiling is chosen the insulation value must be entered under “Roof: Insulation Level”.

**Attic Floor Insulation** – Select the nearest R-value from the dropdown menu choices. If there are multiple insulation levels, perform a UA calculation with the **Assessor Calculator** and round to the nearest R-value on the dropdown menu. If a calculated R-value falls halfway between two menu choices, choose the lower value. Be sure to de-rate the insulation based on the quality of the current install, and to account for any voids by performing a weighted average R-value calculation on the **Assessor Calculator**. A void of just 2% can have a significant impact on the overall R-value.

### **Foundation 1**

If there is more than one type of foundation construction or more than one type of foundation insulation type, you should enter the information as two foundation types by clicking “Enter a second foundation / floor”.

**Foundation area** – Enter the ft<sup>2</sup> area for each foundation type. If there is just one foundation type, the foundation area will be the same size as the **lower story** area you measured while determining the house conditioned area, excluding cantilevered areas or bump outs, etc. If there is more than one

foundation type, click “Enter a second foundation / floor”. Additional fields will be displayed so that the characteristics of a second foundation type can be entered – be sure to enter the correct area for each. If there are more than two foundation types, combine the most similar types to narrow down the variables to just two and use the **Assessor Calculator** to perform a UA calculation if necessary in order to determine the overall insulation R-value of the combined types.

Foundation Type – Choose the type from the dropdown menu. If Slab-on-grade is chosen an insulation value must be entered under “Foundation walls insulation level”. If you know insulation is installed under or around the perimeter of the slab, select R-5. In all other cases select R-0. An unconditioned garage under a conditioned living space should be characterized as an “Unconditioned basement”. For a house built on an open foundation such as on piers, the foundation type should be characterized as “Vented crawlspace”. Also, if there are significant bump-outs/cantilevered areas, a second foundation type should be entered for those spaces and “Vented crawlspace” should be chosen for the foundation type.

Floor Insulation above basement or crawlspace – If the foundation type is basement or crawlspace, the insulation value between that space and the floor above should be entered. Select the nearest R-value from the dropdown menu. If there is no insulation, select R-0. If there are multiple insulation levels within one foundation type, perform a UA calculation and round to the nearest menu choice. If a calculated R-value falls halfway between two menu choices, choose the lower value.

Foundation Wall Insulation level – If the foundation wall is insulated, select the nearest R-value from the menu choices. If there is no insulation, select R-0. If there are multiple insulation levels, perform a UA calculation and round to the nearest dropdown menu choice. If a calculated R-value falls halfway between two menu choices, choose the lower value. If the foundation type is Slab-on-grade and you know there is insulation installed under the slab, select R-5; otherwise select R-0.

PLEASE NOTE - Both the foundation and floor insulation fields must have a value entered. If one of them does not apply to the house, select R-0 for the field that does not apply. Unlike the roof and attic, it is okay to enter non-zero values in both of these insulation fields. For example, a conditioned crawlspace might have insulation on both the foundation wall and between the floor joists of the crawlspace ceiling – both values should be entered.

Walls – If the wall on one or more sides of the house is different from the others, the characteristics of each side of the house must be entered. If all sides of the house are the same, the characteristics should only be entered once. For townhouses, enter the information about the exterior (exposed) walls only.

Townhouse – This includes row houses, duplexes, townhomes, or any house sharing a wall with another house. Indicate the position relative to the other units: end right, end left, or middle. The right and left positions are determined by street view (facing the front of the house from the street).

**Construction** and **Exterior Finish** – If there is more than one type on a single wall choose the predominant type. If the home’s wall construction or exterior finish is not one of the choices, select “Wood Frame” and “Wood Siding”.

**Insulation** – Enter the nearest R-value from the dropdown choices. If there are multiple insulation levels, perform a UA calculation with the **Assessor Calculator** and round to the nearest R-value on the dropdown menu. If a calculated R-value falls halfway between two menu choices, choose the lower value. If the wall insulation cannot be readily determined try to estimate the installation based on historical local building practices and codes, or use the default values in the chart below, based on the type of wall construction and the year it was built:

**Table 1. Default R-values for Wall Cavity Insulation (Based in Part on Huang & Gu 2002)**

Wall Construction Type	Year of Construction			
	1990+	1980-89	1950-79	Pre 1950
2x4, 16 in. o.c.	13	11	9	7
2x6, 24 in. o.c.	19	17	15	13

**Skylights** - If there are multiple skylight types, enter the skylight characteristics of those that make up the largest combined area.

**Panes, Frame Material, Glazing Type** – Choose from the dropdown menu choices. If there are multiple types, choose the predominant type.

**Skylight Size** – Enter the total skylight area of all skylights in the house combined.

**Windows** - If the windows are the same on all sides of the house, only one set of characteristics should be entered. If at least one side is different from the others, distinct window characteristics must be entered for each side of the house.

**Window Area** – Enter the total window area from each side of the house. The right and left positions are determined by street view (facing the front of the house from the street). The glass in entry doors (excluding storm doors) should be considered as windows.

**Panes, Frame Material, Glazing Type** – Select from the dropdown menu choices. If there are multiple types on a side, choose the predominant type. Storm windows should be characterized as an additional

pane only, i.e. a single pane window with a storm window should be characterized as “Double-pane”. Storm window frame material is irrelevant.

U-Factor and SHGC – If this info is available the “Actual window specification” button should be clicked and these values should be entered instead of the window characteristics.

## **Systems**

System Efficiency Values for heating, cooling and hot water equipment should always be entered instead of the year installed. Please utilize the “Equipment Efficiency Calculator” tab in the **Home Energy Score Assessor Calculator** to determine the efficiency of an appliance. The Calculator provides more accurate calculated efficiencies than the Scoring Tool, since the Scoring Tool significantly de-rates efficiencies when the year installed is entered. The Calculator requires you to enter the age of the equipment, which is determined by the year of manufacture. If this date is not printed on the service data plate and is not available from the owner, it can be determined from the serial number on the service data plate. Go to [www.buildingcenter.org](http://www.buildingcenter.org) to look up the serial number code by manufacturer, which should enable you to determine the age of the equipment.

Percent of conditioned floor area served by system – enter the percentage of the conditioned floor area served by the system as a whole number. If there is only one system, enter 100. If there are multiple systems, the sum of the percentages must equal 100. If there is a second system, scroll down (past “Ducts”) and click 'Enter a second system'. The screen will expand to provide a second set of data entry elements for the second system. Calculate or estimate the percentage of the home served by each system, based on the square footage that system serves. If there are more than two systems, combine similar systems and enter the system size-weighted average efficiency, which can be determined using the **Assessor Calculator**. For example, if a home is serviced by two heat pumps and one gas furnace, combine the two heat pumps as System 1 and calculate the weighted average efficiency (based the calculated efficiency of each heat pump and on the sq. ft. each unit serves). Enter the gas furnace as System 2.

If wood heat is frequently used as a supplemental heat system, enter it as System 2 and attempt to characterize the amount the wood heat is used as a percentage.

If the house has a hybrid heat pump with a gas furnace back-up, do not enter the gas furnace back-up as a second system – the Scoring Tool already calculates for back-up heating in heat pumps.

**Heating** – If there are multiple systems, characterize the two largest systems. If there are more than two systems, combine those using the same fuel and calculate a system size-weighted average efficiency.

\*If the home is heated and/or cooled by ductless or mini-split heat pump(s), choose “Heat pump” and make every effort to determine the actual installed efficiency of the unit(s) as it is significantly higher



than the default values. Although there are no actual ducts, the Tool requires an entry for ducts when heat pump is selected - enter "Conditioned space", 100%, and "Yes" for both insulated and sealed.

**Heating System Efficiency** – It is always preferable to enter the efficiency rather than the year installed. Gather the information from the equipment or the homeowner and determine the efficiency using the **Assessor Calculator**. The efficiency is entered as AFUE for combustion heat and electric furnace, HSPF for heat pump, and COP for ground coupled heat pump. If the installed year is entered (not allowed for gchp), the efficiency value will default to a delivery weighted average efficiency for that year, and high efficiency equipment will incur a significant penalty. The Tool provides default efficiencies for wood heat and electric resistance, so the efficiency/install date fields will be hidden when either of these is chosen. Combustion Furnace/Boiler efficiency values (AFUE) should not be entered as less than .70 unless you actually measure it as such. Heat pump efficiency values (HSPF) should not be less than 6.5.

**Cooling** - If there are more than two systems, combine similar systems and determine the combined efficiency by calculating a system size-weighted average efficiency using the Assessor Calculator. If there are more than two dissimilar systems, enter the data for the largest systems.

**Type of Cooling System** – If heat pump was selected for the Heating System it will automatically be selected for the Cooling System. If the home is cooled by a ductless or mini-split heat pump, please see \* above.

The Home Energy Score does not currently model evaporative cooling systems. If the house has an evaporative/swamp cooler, choose "Central air conditioner" as the type of cooling system, click "Yes" for efficiency, and enter **28** as the efficiency value. Do not click "No" and enter the year installed to obtain the efficiency as this will produce an erroneous value.

**Cooling System Efficiency** - It is always preferable to enter the efficiency rather than the year installed. Gather the information from the equipment or the homeowner and determine the efficiency using the **Assessor Calculator**. The efficiency is entered as SEER for central air conditioning or heat pump, and EER for room/window air conditioning or gchp. If the installed year is entered (not allowed for gchp), the efficiency value will default to a delivery weighted average efficiency for that year, and high efficiency equipment will incur a significant penalty. Air conditioning/heat pump (cooling) efficiency values (SEER) should not be less than 9.

**Ducts** – The duct fields will be hidden when a non-ducted system is chosen (i.e. electric baseboard, boiler or wood heat) and there is no central air conditioning.

**Duct Location** – choose the location. \*See above for ductless or mini-split heat pumps.

**Percent in that location** – indicate the whole number percent of the duct length in that location with the same insulation and duct seal characteristics. There are up to 3 entries available - the sum of the location percentages must equal 100.

Are the ducts insulated/sealed – Answer yes or no based on those ducts referenced in the duct location entry. Ducts should only be considered sealed and/or insulated if the Assessor has visually verified as such, i.e. duct mastic/spray foam/UL-181 tape on joints and insulation on (or in) the ducts, particularly in unconditioned areas.

### **Hot Water**

Hot Water Type – If there are multiple systems using different fuels, enter the characteristics of the largest one. If the water heater is an instantaneous/on-demand type, choose storage type and make every effort to determine the actual installed efficiency of the unit(s), as it is significantly higher than the default values.

Water Heater Efficiency – It is always preferable to enter the efficiency rather than the year installed. The Tool will accept an energy factor as high as 3.00 (for a heat pump water heater). If the energy factor is unknown, use the default values from the “Equipment Efficiency Calculator” in the **Assessor Calculator**. The energy factor should be rounded to the second decimal. If the installed year is entered the efficiency value will default to a delivery weighted average efficiency for that year, and high efficiency equipment will incur a significant penalty. If there are multiple systems using the same fuel calculate and enter a system size weighted average efficiency using the **Assessor Calculator**. If there are multiple systems using different fuels, enter the efficiency of the largest system.

If one of the home’s heating systems is a boiler and it provides the domestic hot water as well, select “Boiler with tankless coil” or “Boiler with indirect tank” appropriately – no efficiency value is required.

## **Alternative report/label options**

There are functions available which allow assessors to create reports with customized recommendations. By clicking the selectable menu next to the completed score on your Dashboard you have the option to either:

- I. create a “Final” report that has the actual score only, and excludes the “Score with improvements” score as well as the “Recommendations” page; or,
  - II. create a “Custom” report that provides a projected “Score with improvements” based on your own custom recommendations (as opposed to the default recommendations).
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- I. In order to create a “Final” report after doing a post-improvement score of the home (Assessment type: “Final”), select “Final report” from the drop down menu next to the home’s label icon on your Dashboard, and click on the label icon. After

a few seconds the report will generate and open. The report can be converted and saved as a PDF. To return to your Dashboard, click “Back to Dashboard”.

- II. To create a “Custom” report that provides a projected “Score with improvements” score based on your own custom recommendations, you’ll need to do the following:
  1. Score the home – Create a label for the home in its existing condition as you normally would. Choose the appropriate Assessment Type (“Initial” or, if it’s already been scored before, “Corrected” or “Alternative EEM”).
  2. Re-Score the home incorporating your projected improvements – Using your own custom recommendations, rescore the home incorporating the improvements you will be recommending to the homeowner (outside of these recommendations, all other inputs should be identical to the previous session), and create the “projected” score label. Be sure to select “Alternative EEM” as the Assessment Type.
  3. Go to your Dashboard – Next to the first score of the home, open the drop down menu – select “Custom improvement with Label #####”, the numbers referring to the other session (or sessions) created for that address. Select the alternative or projected session and click on the home’s label icon to generate the report.
  4. Provide to the homeowner – the customized label along with the separate list of recommendations you used to create the projected re-score.

## Troubleshooting

- Problems logging on: Assessors must enter their Assessor ID in the username field and their password at <http://hescore.labworks.org> in order to access the Home Energy Score. If you do not know your Assessor ID please click on the “Request new password” tab on the login screen and enter the email address you originally provided to your Partner. An email with your Assessor ID (username) in the salutation and a temporary link will be sent to you at that email address. Go to your email, open the email from [assessor@sra.com](mailto:assessor@sra.com), and click on the temporary link in the email message. Follow the password instructions. Once you’ve created a new password, be sure to record your username and password for future reference.
  - If you no longer have access to the email account you provided to your Partner please contact us at [assessor@sra.com](mailto:assessor@sra.com) to register a new email address.
  - If you’re typing in your Assessor ID / password and it’s not working, check to make sure that your caps lock is not on.

- Do not share your login or allow others to score homes through your login; doing so will compromise your status as an Assessor and your access to the Scoring Tool will be blocked indefinitely.
- **Session “Lock-ups”:** If you enter data into a session, then exit the Home Energy Score before creating the label, and then re-access the session a few minutes later it may cause the session to lock-up, in which case you’ll need to wait at least an hour before the session is unlocked. If you find that the session is permanently locked you will need to start over by creating a new session. In this case the permanently locked session can be deleted from your Dashboard. If you seem to be locked out of the Scoring Tool, please notify us at [assessor@sra.com](mailto:assessor@sra.com).
- **Reporting Problems:** If you run into an error or need to report a problem with the Home Energy Score software please provide as much information about the issue as possible in your email, including screen captures, to [assessor@sra.com](mailto:assessor@sra.com). If it is about a particular run, provide the Session ID number and whether you generated a score or were entering data at the time of the failure. If you are using a third party software to access the Scoring Tool, identify the software in your email and Cc the software vendor to your message.

## Other

- Building America Solutions Center website at <http://basc.energy.gov>
  - DOE’s new free resource on building science & energy efficient construction
  - Lots of diagrams, renderings, and photos
  - Step-by-step “how to” instructions
  - Mostly focused on new construction but existing construction is being added
  - Users can “gather” the information that is most helpful to them
  - Users can provide feedback to the site, including content

## Home Energy Score Technical Team

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