RdSAP 10

RdSAP 10

- This CPD Module will go through the upcoming changes to the RdSAP Calculation methodology that are being introduced this year.

- Domestic Energy Assessors will need to be aware of these changes as additional information will need to be collected for all EPCs completed from that date onwards.

- The new calculation engine – RdSAP 10 – will enable more accurate EPCs to be completed and fewer default assumptions will be made by the software.

- For assessors however additional time will be needed to complete both the site survey as well as the data entry process into the software.

RdSAP 10

- There are a total of 30 changes that are being made to the RdSAP calculation engine and this CPD module will go through each of these.

- Some of these changes will have a big impact on DEAs and some will have almost no impact at all, however assessors will need to be aware of all 30 changes going forward.

- As well as the introduction of the new calculation engine Quidos will also be making some changes to the iQ-Energy and iQ-Mobile interfaces which will be introduced at the same time – this will be covered in future CPD modules.

- This CPD module will be focusing solely on the 30 changes to the engine and the impact on the data collection process for the assessor.

RdSAP 10

- The 30 different changes cover a variety of different aspects of the RdSAP process.
- This CPD module has ordered the changes into three categories:
    1. Significant change for the assessor
    2. Moderate change for the assessor
    3. Change to the calculation process
- We strongly advise assessors read through this CPD module and fully acquaint themselves with the changes that are due to come in.

Significant changes

- The first section of this module will look through what are considered the significant changes coming in with RdSAP 10:

1. Measurements required for all windows
2. Location of each window required
3. Window shutters added as new feature
4. Additional insulation thicknesses
5. Hot water tank size
6. Hot water tank heat loss
7. Additional roof room options
8. Additional alternative wall option
9. Additional entries for ventilation
10. Extra lighting entries

Significant changes

1. Measurements for all windows

1. Measurements for all windows

- The biggest change being introduced within RdSAP 10 is that going forwards for EPCs assessors will need to measure all the windows present at a property.

- Under the current RdSAP engine assessors only need to measure all the windows in limited circumstances when there is much more or less than typical glazing.

- For RdSAP 10 however each individual window will need to have all of its individual data taken down and entered within the software.

- This is the change within RdSAP 10 that will likely have the biggest impact on how long the data collection process for the assessor takes.

1. Measurements for all windows

- The following pieces of information will be needed for each and every window:
  - Window opening
  - Window orientation
  - Frame type (PVC or not)
  - Glazing type – single/double/triple/secondary
  - Glazing gap – 6mm/12mm/16mm
  - Window age
  - Draught proofing – yes or no
  - Presence of shutters

1. Measurements for all windows

- Entering the windows in this manner will enable a more accurate EPC to be produced.

- Under the current RdSAP engine an assumption is made about total glazed area based on the dwelling's age – however unlike other default assumptions this is an area where the actual values can be determined.

- This applies to all windows in the property except for conservatory windows where there will be no requirement to measure them.

- As previously mentioned this new requirement will likely add a reasonable amount of time to each assessment so assessors will need to plan accordingly.

1. Measurements for all windows

- Quidos is mindful of this extra work assessors will need to take on and in response we have been making improvements to the iQ-Mobile app to enable window data to be collected much more expediently.

- These changes will be finalised prior to the launch of RdSAP 10 and we would encourage all members to trial the use of the app and see whether this offers a better means of completing a new RdSAP 10 EPC.

- Full details of the app revisions will be released in the coming weeks, please look out for the CPD module that will be released covering these in detail.

- Over time we expect that this change to window data collection will become second nature for assessors.

2. Location for each window

2. Location for each window

- This second change builds off of the back of the previous change already discussed.
- For each window assessors will need to select which building part the window is located in.
- So assessors will need to choose whether an individual window is in the main property or one of the extensions.
- The iQ-Mobile app will deal with this data entry in an efficient manner for assessors.

3. Window shutters

3. Window shutters

- The final change relating to windows involves the assessor needing to select whether or not shutters are present.

- In this context a shutter is defined as a product where the curtain is made of a rigid material installed to provide or modify characteristics such as thermal and visual properties.

- If there are shutters present the assessor will need to select whether or not the shutters are insulated.

- Having shutters present will reduce the amount of heat loss assumed to occur through a window opening.

4. Additional insulation thicknesses

4. Additional insulation thicknesses

- Under the current RdSAP engine the various insulation thicknesses are generally able to be selected in increments of 50mm.

- Going forward however RdSAP 10 will allow assessors to choose insulation thicknesses in increments of 25mm, with the option of 10/12mm also included as a minimum base value.

- This applies to all thermal elements including walls, floors, roofs and roof rooms.

- This is particularly useful for wall insulation that is less than 50mm thick (and not able to be doubled), which currently cannot be entered into the software.

5. Hot water tank size

5. Hot water tank size

- Currently within RdSAP an assessor is required to choose whether a hot water cylinder is either normal (up to 130 litres), medium (131-170 litres) or large (>170 litres).
- In RdSAP 10 however assessors will be able to enter the specific cylinder size into the software.
- So for example if it has been determined that the cylinder is 230 litres this will be able to be entered.
- This will give a more accurate calculation for the hot water losses experienced at the dwelling.

6. Hot water tank heat loss

6. Hot water tank heat loss

- In RdSAP 10 assessors will also have the ability to enter in the specific kWh/day heat loss for a hot water cylinder.
- This can often be found on the data plate for the cylinder and gives a very accurate value for the water heating heat losses.
- When this value is available all the other data entries for a hot water cylinder become redundant and this becomes the only value that assessors are required to enter.
- Any modern encapsulated cylinder will usually have the heat loss values on the data plate.

7. Additional roof room options

7. Additional roof room options

- Another big change coming in with RdSAP 10 is the ability to enter in more information for a roof room.

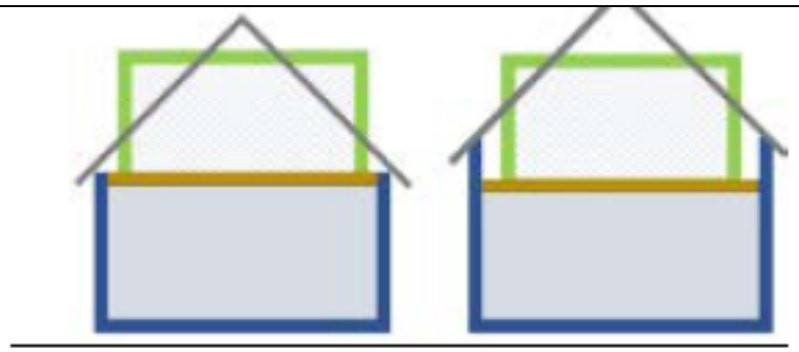
- Assessors will still have the option to select the detailed assessment option for roof rooms when differing levels of insulation have been identified at the various junctures.

- When this is not selected however assessors will need to select whether the roof room at the property is considered a ‘true’ roof room or not.

- Depending on which option is chosen different pieces of information need to be entered.

7. Additional roof room options

- A ‘true’ roof room is one in which the roof room is fully within the roof space:



There is no common wall in the true RR type, therefore 1.8m rule does not apply.

The following steps apply when:

RR is either:
-RR fully within the roof (left diagram above), or
-RR type with accessible areas of continuous common walls which are outside the boundaries of the RR (right diagram above).

7. Additional roof room options

- Below shows some real life examples of this:

7. Additional roof room options

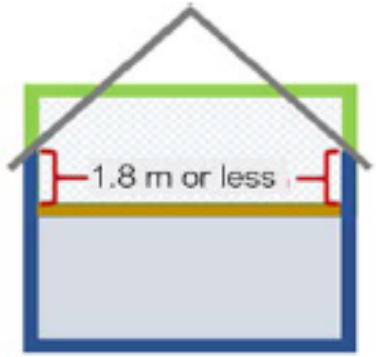
- When a ‘true’ roof room such as this is chosen the assessor will need to enter the following information into the software:
  - Area of space
  - Length of gable wall 1
  - Length of gable wall 2 (if applicable)
  - Length of party wall(if applicable)
  - Length of sheltered wall (if applicable)
  - Length of connected wall (if applicable)

7. Additional roof room options

- The other option to choose from is when the roof room has accessible areas of the continuous common wall:

4.9.2 The approach to RR Type with the accessible areas of continuous common walls

(see also section 2.16):



This type of RR is checked for the 1.8 m rule. It is considered as Room in Roof when the height of accessible common walls is less than 1.8 m (otherwise it is a separate storey).

7. Additional roof room options

- Here are some examples of this where the roof room is actually more of a short storey (less than 1.8m) rather than a genuine room within a roof:

7. Additional roof room options

- When this type of roof room is chosen the assessor will need to enter the following information into the software:
  - Area of space
  - Length and height of gable wall 1
  - Length and height of gable wall 2 (if applicable)
  - Length and height of common wall 1
  - Length and height of common wall 2 (if applicable)

7. Additional roof room options

- These additional selections for roof rooms will take assessors time to get use to.

- Again however they will allow a more accurate EPC to be created as at the moment the software makes significant assumptions about roof rooms which aren't necessarily in line with what is actually present.

- The additional information required for each different type ultimately only amount to a few extra measurements.

- The roof room details can make a big difference to the EPC rating so it is important that assessors get this one right.

8. Additional alternative wall option

8. Additional alternative wall option

- This next change is a straightforward one – assessors will be able to select two alternative walls for each building part.

- This is particularly useful for flats which can often have a sheltered wall and another separate alternative wall which can now be easily defined without the need for splitting into main property/extension(s).

- This additional option in the software should therefore save assessors time for when this particular scenario arises.

- The information for the extra alternative wall remains exactly the same as for the regular alternative all entries.

9. Additional entries for ventilation

9. Additional entries for ventilation

- Going forwards assessors will need to make a number of additional ventilation entries for the EPC.

- Currently the only ventilation entry that needs to be made is the number of open fireplaces however this is increasing in RdSAP 10 with some additional entries required.

- These enable the calculation to be more accurate as the ventilation requirements will be better understood.

- These additional requirements won't be encountered too often however when they are they can now be accounted for.

9. Additional entries for ventilation

- The additional entries are for the following:
  - Number of blocked chimneys
  - Number of open flues
  - Number of closed fire flues/chimneys
  - Number of solid fuel boiler flues
  - Number of flues attached to other heaters
  - Number of extract fans
  - Number of passive stack vents
  - Number of flueless gas fires
- The entries for these into the software will be a simple number count for each.

10. Extra lighting entries

10. Extra lighting entries

- The last significant change in the RdSAP engine that will impact assessors is an adjustment to how lighting is entered.

- In the current version of RdSAP there are two entries required for lighting; the total number of fittings and the total number of low energy fittings.

- In RdSAP 10 however the number of entries required is expanded, with assessors required to enter four pieces of information:

1. Total number of bulbs
2. Number of LEDs
3. Number of CFLs
4. Number of incandescent bulbs

10. Extra lighting entries

- The reason for this change is that there is a considerable difference in efficacy between LED and CFL bulbs which isn't currently taken into account in the EPC.

- A typical LED bulb is considered to have an efficacy of 100 Lm/W whereas a typical CFL bulb has an efficacy of 55 Lm/W.

- Having to enter the LEDs and CFLs separately will therefore enable the engine to more accurately calculate the lighting energy consumption for the building.

- The incandescent bulb choice covers all tungsten and halogen style bulbs.

10. Extra lighting entries

- There may be circumstances where for whatever reason assessors are unable to differentiate between whether a bulb is CFL or LED.

- In this scenario the assessor can instead choose the enter the total number of low energy bulbs (both CFL and LED combined) and the software will assign an average efficacy of 80 Lm/W.

- Even if an assessor is unsure about just a single bulb this will be the option that needs to be chosen.

- We would however expect assessors to be able to differentiate between LED and CFL in the vast majority or circumstances.

Moderate changes

Moderate changes

- The next section of this module will look through what we consider to be the moderate changes brought in with RdSAP 10.

11. Thermal properties of insulation revised
12. Table of window U-Values expanded
13. Curtain wall added as new wall type
14. Mechanical ventilation
15. PV diverter for water heating
16. PV batteries
17. Air pressure test results
18. Small scale hydro
19. Basement construction options

11. Thermal properties of insulation

11. Thermal properties of insulation

- Some small changes have been made to particular insulation choices within the software, particularly for solid walls and roof rooms.

- When retro-fitted insulation is selected for either solid walls and roof rooms assessors will need to identify the insulation thickness and also the *type* of insulation.

- This is a simple choice between rockwool type insulation and PUR insulation board type.

- Based on the insulation type chosen the software will assign a U-value representative of the insulation and its thickness.

11. Thermal properties of insulation

- It is important to note that this change is only being introduced for retro insulation on walls (age band A-E) and extended roof room entries.

- For all other walls, roofs and floors the only requirement will be to enter the insulation thickness and the existing Convention with regards doubling the thickness still applies.

- On a general note, prior to the introduction of RdSAP 10 a new version of the Conventions will be released.

- These new Conventions will cover many of the issues likely to occur with the new set of data entries being introduced and will be distributed to assessors when available.

12. Window U-Values expanded

12. Window U-Values expanded

- With this next change some additional options have been brought into the window type selections.

- Assessors will need to choose whether the window frame is either PVC/wood or metal, which is a slight change to how the window frame type is currently selected.

- There is also an additional window age band added which is post-2022 windows, enabling modern high performance glazing to be taken account of.

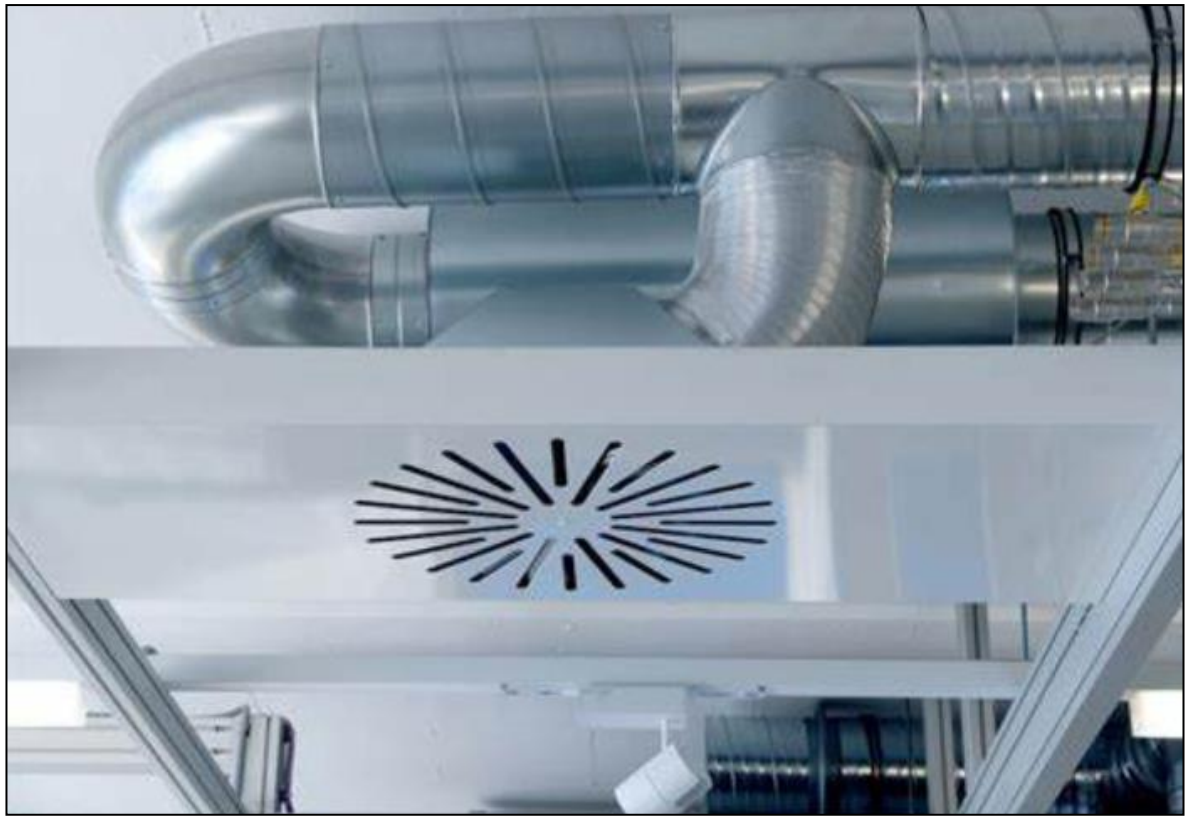
- Again these changes allow a more accurate EPC to be produced and the heat loss calculations to be more accurate.

13. Curtain walls added

13. Curtain walls added

- A new wall type will be available for assessors to choose from in RdSAP 10 which is curtain walling.
- Curtain walling is defined as a thin and lightweight system usually consisting of aluminium or steel frames and glass.
- The walls are not usually structural and by design they are only able to carry their own weight while transferring the load of wind and gravity to the structure of the building.
- This won’t be a wall type that is encountered too often however when it is it can now be entered.

14. Mechanical ventilation



14. Mechanical ventilation

- In the current version of RdSAP the options for mechanical ventilation are relatively limited as assessors can only choose from either a default extract only or balanced system.

- In RdSAP 10 however assessors will be able to choose a mechanical ventilation system from a database in much the same way that a boiler is currently chosen from the PCDB.

- Mechanical ventilation is still comparatively rare however these type of systems are becoming more common.

- Choosing from the database enables a more accurate EPC and calculation to be produced.

14. Mechanical ventilation

- If a mechanical ventilation system is present but cannot be identified in the PCDB there are additional options for the assessor to choose from:
  - Positive input from loft
  - Positive input from outside
  - Centralised mechanical extract
  - Decentralised mechanical extract
  - Mechanical ventilation with heat recovery
  - Mechanical ventilation without heat recovery
- These systems will apply to whole house ventilation systems only.

15. PV diverter for water heating

15. PV diverter for water heating

- Within RdSAP 10 assessors will be able to select whether any PV system present is fitted with a PV diverter for water heating.

- A PV diverter is an electronic device that allows users to divert excess energy from the PV system to an immersion heater within a hot water cylinder.

- When the energy requirements of the property are less than what is being generated by the panels the diverter will instead send the energy to power the immersion heater.

- At certain points of the year when the solar energy is high this can provide all the hot water requirements for the property.

15. PV diverter for water heating

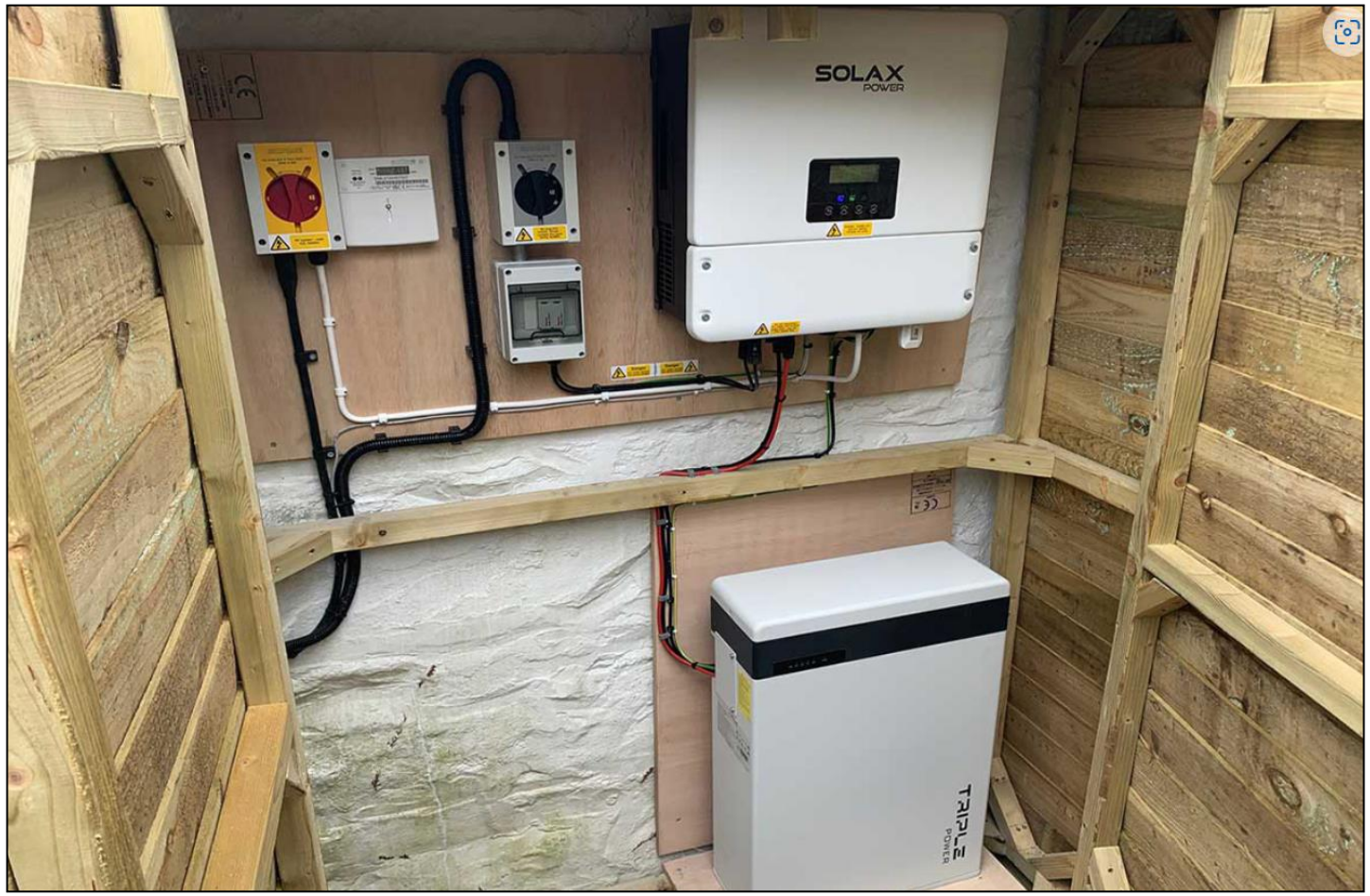
- It is important that this system isn't confused with solar thermal panels which is a completely different type of system – this is a PV system with a diverter added.

- The diverter may look like the below:

15. PV diverter for water heating

- The only piece of information that the assessor is required to enter is whether a diverter is present or not.
- Based on the location and size of the property the software will determine what the impact is on the hot water requirements.
- The diverter will not necessarily be located in the same set place so assessors will need to keep an eye out for it around the property.
- When a PV system is present it will be worthwhile for the assessor to discuss with the homeowner whether or not a diverter has also been installed in order to help locate where it is.

16. PV batteries



16. PV batteries

- Another of the new changes being introduced with RdSAP 10 is the ability to enter PV Batteries into the calculation.

- Under the current RdSAP there is no means of entering any PV battery storage capacity.

- PV battery technology is advancing and it is becoming more commonplace for PV installations to have a battery installed.

- A PV battery allows excess solar energy to be stored and then used as and when required which is a better economic decision than sending the excess electricity back to the grid.

16. PV batteries

- Up to 4 different PV batteries can be entered for an individual EPC.
- The assessor will need to enter the kW capacity for each battery, with the software assuming a default value of 5kWh when the information is not readily available.
- The kWh capacity information will typically be listed on the battery itself or on documentation nearby.
- Failing this the make/model of the battery should be able to be obtained and further information on the kW capacity found on material online.

17. Air Pressure test results

17. Air Pressure test results

- RdSAP 10 will allow assessors to enter in a pressure test result if one has been carried out on the dwelling.

- Pressure tests are carried out to determine the air permeability of the property and are much more commonplace on newly built dwellings as this is a requirement of the Building Regulations.

- The process can also be carried out on existing buildings however and this is why this functionality has been added in.

- Properties which are going through whole house retrofit will often have a pressure test carried out, often both at the start and end of the retrofit process.

17. Air Pressure test results

- In order to enter a pressure test value an official test certificate must be obtained. This value can be entered into the software and it will then be used to calculate the air permeability value for the dwelling.

- This will impact the ventilation rate, heat losses and space heating requirements.

- Typically speaking the lower the air permeability for the dwelling the lower the heat losses therefore properties which have had an air permeability test carried out will score better on EPC.

- A convention will be released to provide further guidance on how air test results should be entered.

18. Small scale hydro

18. Small scale hydro

- Within RdSAP 10 assessors will be able to enter in whether the dwelling is connected to a small scale hydro system.
- This can only be entered when clear documentary evidence is available showing the connection.
- In this circumstance the kWh supplied per year by the hydro can be entered into the calculation.
- This will be encountered very rarely however will improve the EPC rating when this type of system is installed.

19. Basement construction options

19. Basement construction options

- The final small change that is coming through in RdSAP 10 is that there will be additional basement specific construction options to choose from in the software.

- A basement is defined as a floor which is at least 50% below ground level (when the whole footprint of the basement is taken into account).

- Basement walls and floors have different U-values to conventional external wall and floors and these can now be accurately defined.

- Assessors will now be able to choose from ‘basement wall’ and ‘basement floor’ from the usual drop down of wall and floor options and the relevant U-values assigned.

Calculation changes

Calculation changes

- The final section of this module will go through changes that are being made to the calculation process. They are:

20. PV calculation has changed
21. Floor insulation revised
22. U-values of brick walls revised
23. U-values of stone walls revised
24. New age band M added
25. Data for Isle of Man added
26. RdSAP 10 specific fuel prices
27. Flue gas heat recovery changes
28. Waste water heat recovery changes
29. Heat pump calculation changes
30. Changes to improvement measures

20. PV calculation has changed

20. PV calculation has changed

- The changes that we will be covering in this section are to the calculation engine and will have little to no impact on how the data collection process for EPCs is completed.

- It is important however for assessors to understand that changes are happening so that explanations can be given to customers when needed.

- Firstly, the calculation for PV is being adjusted in RdSAP 10 and is being brought in line with how the calculation is carried out in SAP 10.2

- This will have no impact on any data entries required for PV however the impact on the rating that PV has will be different to what it currently has for the existing domestic EPC

21. Floor insulation revised

21. Floor insulation revised

- The U-value calculation for floor insulation entries has been revised in the calculation engine.

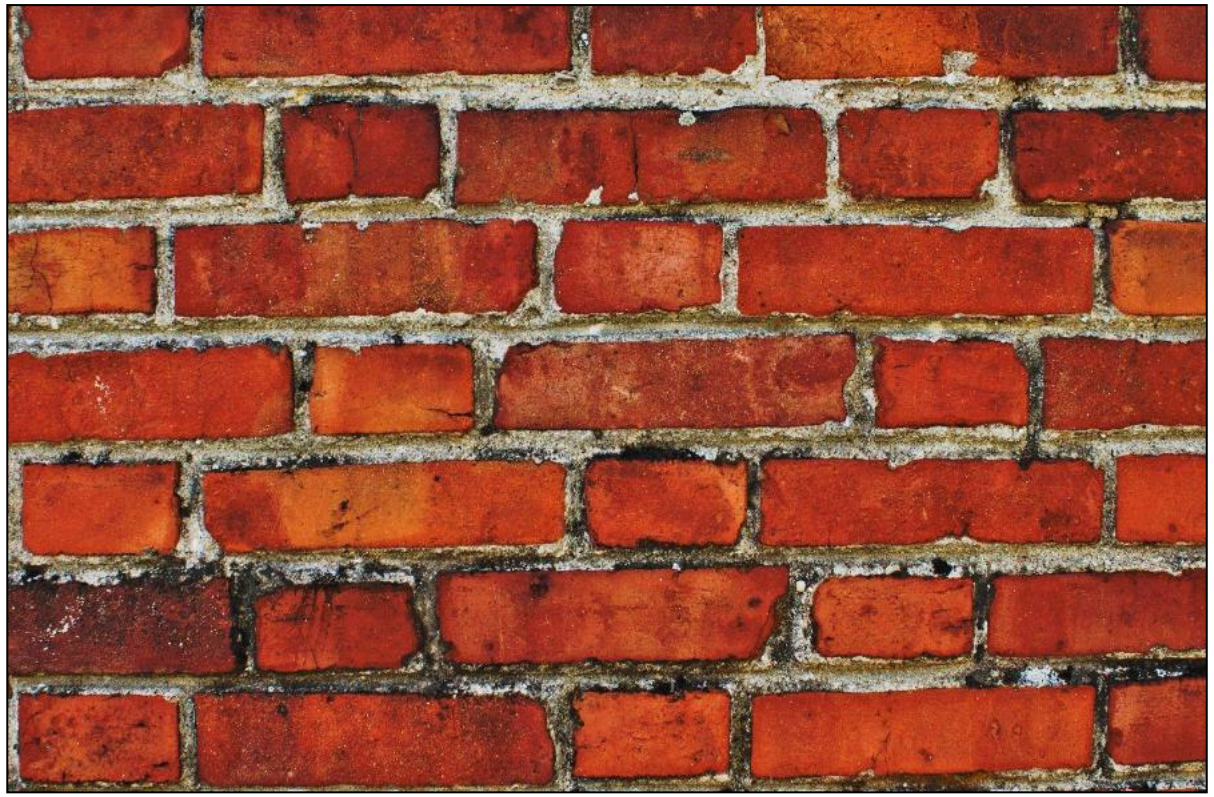
- The calculation for floor U-values is significantly more complicated than for other thermal elements.

- The good news is that there is no need to have any knowledge of this for assessors! Here for example is how RdSAP 10 works out the u-value for solid floors:

For solid ground floors

1. $d_t = w + \lambda_g \times (R_{si} + R_f + R_{se})$
2. $B = 2 \times A/P$
3. if $d_t < B$, $U = 2 \times \lambda_g \times \ln(\pi \times B/d_t + 1)/(\pi \times B + d_t)$
4. if $d_t >= B$, $U = \lambda_g / (0.457 \times B + d_t)$

22. U-Values of brick walls revised



22. U-Values of brick walls revised

- Within RdSAP 10 the wall thickness of solid brick walls will now impact the U-Value assumed by the software.

- In the current version of RdSAP the thickness of a solid brick wall has no bearing on the U-Value assumed which is a limiting feature as the thicker the wall, the lower the U-Value will be.

- Certain older properties can have very thick solid walls and this will now get taken account of within the RdSAP calculation.

- There is no change for assessors here as the thickness of solid walls should have been being measured in any event.

23. U-Values of stone walls revised

23. U-Values of stone walls revised

- After input from numerous heritage groups RdSAP 10 will introduce revised U-values for stone walls so assessors may notice a difference in how the EPC ratings come out for older, stone wall properties.

- Again there is no difference to any data collection process here for assessor however you may notice a change in the EPC ratings for older properties.

- Here is the calculation that RdSAP 10 will now be doing for stone walls:

Table 12 : Default U-values of stone walls

Stone wall type	Equation
Sandstone or limestone	$U = 54.876 \times W^{-0.561}$
Granite or whinstone:	$U = 45.315 \times W^{-0.513}$

Where: W is wall thickness, mm

24. New age band M added

24. New age band M added

- The next change for RdSAP 10 is that Age Band M has been added, which will cover building parts constructed post 2023.
- This will ensure that brand new extensions and roof room conversions can have the most recent and accurate U-Value assumptions assumed.
- All brand new dwellings would be expected to have a full SAP EPC so it is very unlikely that this will be used as the age band for the main property.
- In the certain circumstance where a new dwelling does need an RdSAP however this can now be assigned.

25. Data for Isle of Man added

25. Data for Isle of Man added

- This next change will not impact the vast majority of assessors however the Isle of Man has now been entered as a country that can be selected from for the EPC.

- The Isle of Man has its own weather and climate data and this can now be accurately modelled when doing an EPC in RdSAP 10.

- If any assessors therefore get asked to complete an EPC on the Isle of Man they must make sure to select this accurately from the drop down list of available countries.

26. RdSAP 10 fuel prices

26. RdSAP 10 fuel prices

- It had originally been intended that the fuel prices used to calculate the EPC rating would change with RdSAP 10.
- The original plan was to have separate fuel prices for RdSAP and SAP ratings.
- This however would have made it difficult to compare EPCs and there would have been a divergence between SAP and RdSAP EPC ratings.
- It was decided therefore that in RdSAP 10 the fuel prices will not be updated and therefore remain the same as they are for the current RdSAP engine.

26. RdSAP 10 fuel prices

- It is important to note however that the primary energy and emissions factors *are* being updated for RdSAP 10.
- These are the values that are used to calculate the estimated yearly running costs and savings from improvement measures that appear on the EPC.
- These are updated on a 6 month basis to give homeowners and occupiers the most accurate picture for what their energy efficiency improvements may bring.
- These are separate values to those which are used to calculate the EPC rating, assessors should be aware of this.

27. Flue gas heat recovery changes

27. Flue gas heat recovery changes

- In RdSAP 10 the calculation for flue gas heat recovery systems is being adjusted.
- These type of systems are encountered very rarely however as this is a change that is being made it is included in this module.
- The calculation is being changed to ensure that a more accurate EPC is being produced when these types of system are present.
- If assessors want full details of the calculation change it will be able to be seen within the RdSAP specification.

28. Waste water heat recovery changes

28. Waste water heat recovery changes

- Much like the previous change to flue gas heat recovery systems this is not a change that will impact assessors that greatly.

- However assessors should be aware that the calculation for waste water heat recovery systems is being adjusted in RdSAP 10.

- Waste water systems can reduce hot water energy consumption when installed and the RdSAP engine will be updated to more accurately model how these systems operate in real life.

- Again the RdSAP specification will feature the full calculation should assessors want to go through this at a later date.

29. Heat pump calculation changes

29. Heat pump calculation changes

- Over the coming years assessors are likely to encounter more and more heat pumps with the government having put them at the heart of its drive to decarbonise domestic heating.

- In RdSAP 10 the calculation process for heat pumps has been amended to be made more accurate and better reflect the running performance of these systems.

- Assessors will notice that properties with heat pumps fitted will obtain different EPC ratings and running costs when compared to the existing RdSAP engine.

- Again there is no change to the data collection process however.

30. Changes to improvement measures

30. Changes to improvement measures

- The final changes being introduced to RdSAP 10 are related to the improvement measures that get listed on the EPC.
- The main recommendation change is that air and ground source heat pumps may be recommended more often than is currently the case.
- This again fits in with the government drive to get more domestic properties to install heat pumps to provide the central heating needs.
- There are some additional changes to the improvement measures that assessors will need to be aware of.

30. Changes to improvement measures

- The recommendation for party wall insulation will be removed in RdSAP 10 and will no longer appear.

- The U-values that are used for the improvement measures have been improved and therefore the expected EPC and costs savings improvements will appear greater.

- Recommendations for PV battery and PV diverter will appear on the EPC when considered appropriate for the building.

- Some small changes have been made to the order of measures for Northern Ireland EPCs.

Summary

Summary

- That brings us to the end of this CPD module which has gone over the full list of changes that are coming in with RdSAP 10.

- Having read through the module and digested the information contained within you should be fully aware of the upcoming changes and what impact they will have on you as an assessor.

- The majority of the changes are minor in nature however the requirement to measure windows is a big change that will have an impact on all assessors moving forwards.

- This is the one change that will add a reasonable amount of time to each EPC completed.

Summary

- This CPD Module has looked solely at the changes to the RdSAP 10 calculation engine.
- In March 2024 we will release a further CPD module showcasing the new iQ-Energy interface which assessors will use when creating desktop versions of their EPCs.
- This will be a significant change for assessors and it is important that everyone is familiar with the new interface before it is deployed.
- In the meantime if you have any questions about the upcoming changes to RdSAP 10 please email support@quidos.co.uk.

Quidos
Excellence in Efficiency

The End!