RdSAP 10 Calculation questions

Since the release of RdSAP 10 we have had many questions from assessors about some of the new changes which have been introduced, principally around engine assumptions, certificate descriptions and software processes.

This technical bulletin provides further information on:

- Why certain loft types are now assumed to be insulated
- Why glazing descriptions are now seemingly much more harsh
- Why it is so difficult to get a good lighting description on the EPC
- How roof room descriptions are calculated
- How export capable meters impact the EPC calculation

1. **I have an old house with no loft access, however the EPC is assuming that the roof is insulated. Is this correct?**

Yes, this is correct. In RdSAP 10 the calculation engine now assumes that when the roof is pitched with no access that there is a level of insulation present. The amount of insulation assumed is shown in the table here:

Age band	Pitched, slates or tiles, insulation between joists or unknown (1)
A, B, C, D	0.40 (100 mm) (1) (4)
E	0.40 (100 mm) (1) (4)
F	0.40 (100 mm) (1) (4)
G	0.40 (100 mm) (1)
H	0.30 (150 mm) (1)
I	0.26 (170 mm) (1)
J	0.16 (270 mm) (1)
K	0.16 (270 mm) (1)
L	0.16 (3) (270 mm) (1)
M	0.15 (300mm) (1)

Typically, EPCs have always operated on a worst-case basis assumption, so for this aspect this is a significant change of approach. The logic is that most lofts have now been insulated to some degree, therefore assuming a level of insulation is more realistic and gives a more accurate EPC rating than assuming no insulation.

Please note that this is **only** for pitched roofs with no loft access. For roofs with flat or sloping ceilings the engine will continue to assume a level of insulation in line with the age of the building.

2. **I have a house which is fully double glazed but is being shown on the EPC as 'poor'. Is this correct?**

The description which appears next to the windows on the EPC is based upon the following calculation:

RdSAP assessment. The U-value for this purpose is an area-weighted average for the single glazed and multiple glazed windows (for cases where there is partial multiple glazing). Conservatory windows and roof glazing are **not** included in the calculation of average window U-value.

Table 5 : Rating for windows

Stars	U-value range
★★★★★	<= 1.2
★★★★☆	1.21 – 1.60
★★★☆☆	1.61 – 2.5
★★☆☆☆	2.51 – 3.3
★☆☆☆☆	> 3.3

The star ratings shown above directly correlate to the description that appears on the EPC, with 5 stars being 'very good', 4 stars being 'good' and so on. Poor is 2 stars, and you can see from the above table that this rating is obtained whenever the average U-Value of the glazing is between 2.51-3.3.

When you have a property which is double glazed with unknown age band, the software assumes the age band to be pre-2002.

Double glazed*	England/Wales: before 2002, Scotland: before 2003 N. Ireland: before 2006	6 mm	3.1	3.7	3.4	0.76
		12 mm	2.8	3.4	3.1	
		16 mm or more	2.7	3.3	3.0	
Triple glazed	England/Wales: before 2002, Scotland: before 2003 N. Ireland: before 2006	6 mm	2.4	2.9	2.6	0.68
		12 mm	2.1	2.6	2.3	
		16 mm or more	2.0	2.5	2.2	
Double or triple glazed	England/Wales: 2002 or later, Scotland: 2003 or later N. Ireland: 2006 or later	any	2.0	2.2	2.3	0.72
Double or triple glazed	England/Wales: 2022 or later Scotland: 2023 or later NI: 2022 or later	any	1.4	-	1.6	0.72

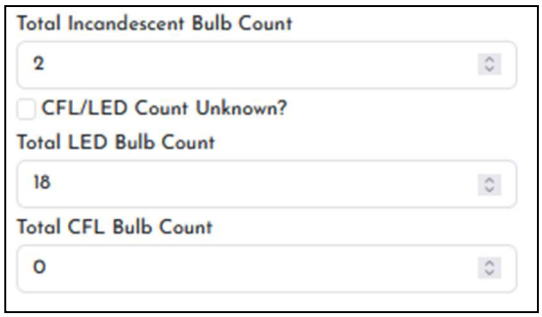
From the above table we can see that the U-values for pre 2002 Double glazing are assumed to be anywhere between 2.7 and 3.4, therefore unknown Double Glazing will **always** score as poor on the EPC.

From the above tables we can also see that Double Glazing between 2002 and 2022 will only score as average.

3. **I have a house which has 18 LED bulbs and 2 tungsten bulbs, so 90% low energy. However, on the EPC the lighting is described as poor, why is this?**

The lighting calculation is now carried out much more harshly in RdSAP 10, and even 1 or 2 tungsten bulbs will be enough to classify the lighting as being below average.

Consider the below example where 18 of the bulbs are LED and only 2 are incandescent:



This gets listed on the EPC as:

Lighting	Below average lighting efficiency	Average

On the face of it this looks like it must be an error, however the calculation for determining how the lighting is described on the EPC is as follows:

Table 6 : Description for fixed lighting - SAP

Average lighting efficacy in Lumens/Watt	Description
<65	Below average lighting efficiency
65-90	Good lighting efficiency
>90	Excellent lighting efficiency

The efficacy of LED bulbs is 100 Lm/W and incandescent are 11.2 lm/W, so again, it is not immediately clear how it can average out below 65.

The key point is that each incandescent bulb is 60w, whereas the LED bulbs are only 9w. Therefore just 2 incandescent bulbs (2x 60w) provide 120w of power, whilst the 18 LEDs (18x9w) provide 162w of power. So, although there are only 2

incandescent bulbs out of 20 (10%) they constitute 43% of the energy consumption. This drops the lumens/watt below 65 and therefore gets listed as below average.

The takeaway here therefore is that just a few tungsten/halogen bulbs will drop the description below average, and only 100% low energy is guaranteed a good listing.

4. **I have a property which has a roof room with insulation at both the flat ceiling and stud walls, however the description on the EPC says 'limited insulation' and 'poor', why is this?**

In this example consider that the following entries have been made on the roof room tab:

Field	Length(m)	Height(m)	Measured insulation(mm)	Insulation Type	Insulation Location	(W/ m^2K)
Flat Ceiling 1	8	3	300mm	Mineral wool or EP		
Flat Ceiling 2						
Slope 1	6	2	Unknown			
Slope 2	6	2	Unknown			
Stud Wall 1	5	1.6	100mm	PUR or PIR		
Stud Wall 2	5	1.6	100mm	PUR or PIR		
Gable Wall 1	6	2.5		Exposed		
Gable Wall 2	6	2.5		Exposed		

This is a typical example where insulation has been seen at both the flat ceiling and stud walls, however there is no access to the sloping ceiling. You may expect that in this scenario the roof room insulation would score highly.

The table below shows how the roof room bandings and descriptions are determined:

Roof room(s)		**Roof insulation, one of:**	**Applies when:**
		No insulation (assumed)	type 1/type2 roof room: Uweighted > 1.5
		Limited insulation (assumed)	type 1/type 2 roof room: 1.5 <= Uweighted > 0.5
		Insulated (assumed)	type 1/type 2 roof room: Uweighted <= 0.5
		Limited insulation	Detailed roof room: Uweighted > 0.5
		Insulated	Detailed roof room: Uweighted <= 0.5

From the above we can see that there are only two descriptions for detailed roof rooms, either 'limited insulation' or 'insulated'. To be listed as 'insulated' the roof room would need to have an average U-Value across all the different elements lower than 0.5.

In our example above although the flat ceiling and slope are well insulated, both the slope and gable wall are assumed not to be (the gable wall is assumed the same as the main wall construction). This moves the average U-Value above 0.5 and therefore gets listed as 'limited insulation'.

5. **Why does my entry into the draughtproofing box get overwritten when I run the calculation?**

The software now automatically calculates the draught proofing percentage based on what has been entered for the individual windows and numbers of external draughtproofed doors.

The software runs a check to see that the value entered into the draught proofing box matches the other entries, and if it does not this value gets automatically changed.

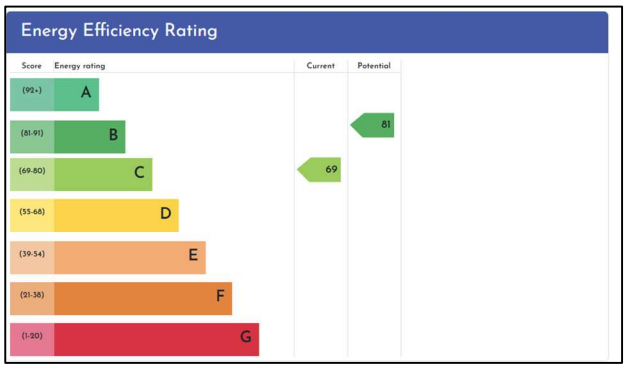
6. **PV seems to have a much smaller impact on the EPC rating compared to RdSAP 9.94, is this correct?**

This is correct but only if the 'export capable meter' option has not been ticked. When the 'export capable meter' option has been ticked the impact of PV on the calculation will be the equivalent to what it was in RdSAP 9.94.

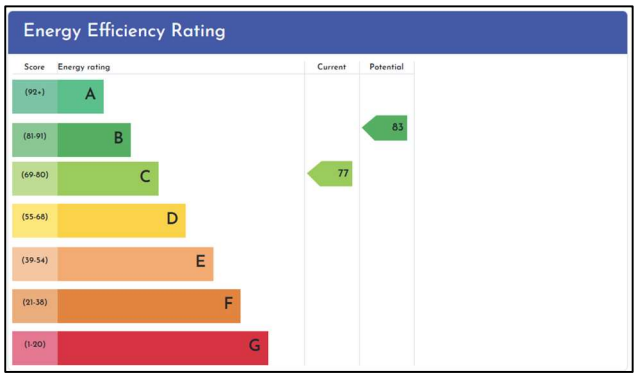
The new calculation engine will only assume that electricity generated by the PV Panels can be exported to the grid if this box is ticked; when it is not ticked the engine will still assume that electricity generated by the panels is used within the property, however no electricity will be assumed exported to the grid.

To illustrate this, consider the following example, a property 1. Without PV 2. With PV but not export capable 3. With PV and export capable

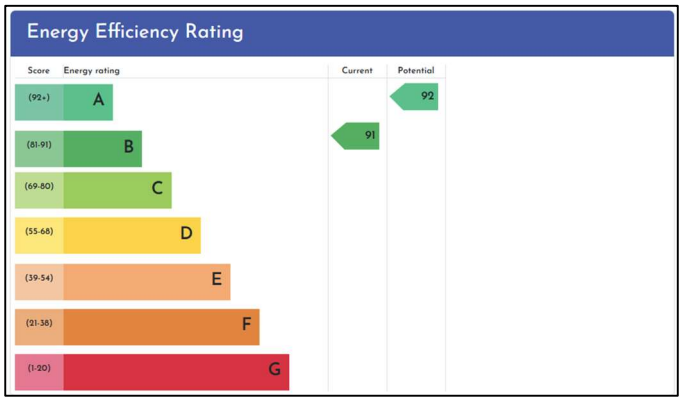
1. Without PV – **C69:**



2. With 4kW PV but not export capable – **C77:**



3. With 4kW PV and export capable – B91:



As we can see from the above example PV on its own increased the rating by **8 points**, however PV with an export capable meter increases the rating by **22 points.**

The question therefore is how do we know whether or not an electric meter is smart capable; therefore, are a number of different clues to look for including:

- Check the meter for labels or model information, looking for terms like ‘bi-directional, import/export, net metering, dual register or export register.
- Check the meter display by scrolling through the display looking for the exp[ort/epx/ex option on the meter
- Take down the meter make/model and check online to see whether the unit is export capable
- In general terms most smart meters are export capable

Here are some images of meters that are export capable:

Summary

Thanks for reading through to the end of this technical bulletin! Hopefully it has been of use, if you have any questions relating to any of the content within, please contact the Quidos technical team at support@quidos.co.uk