

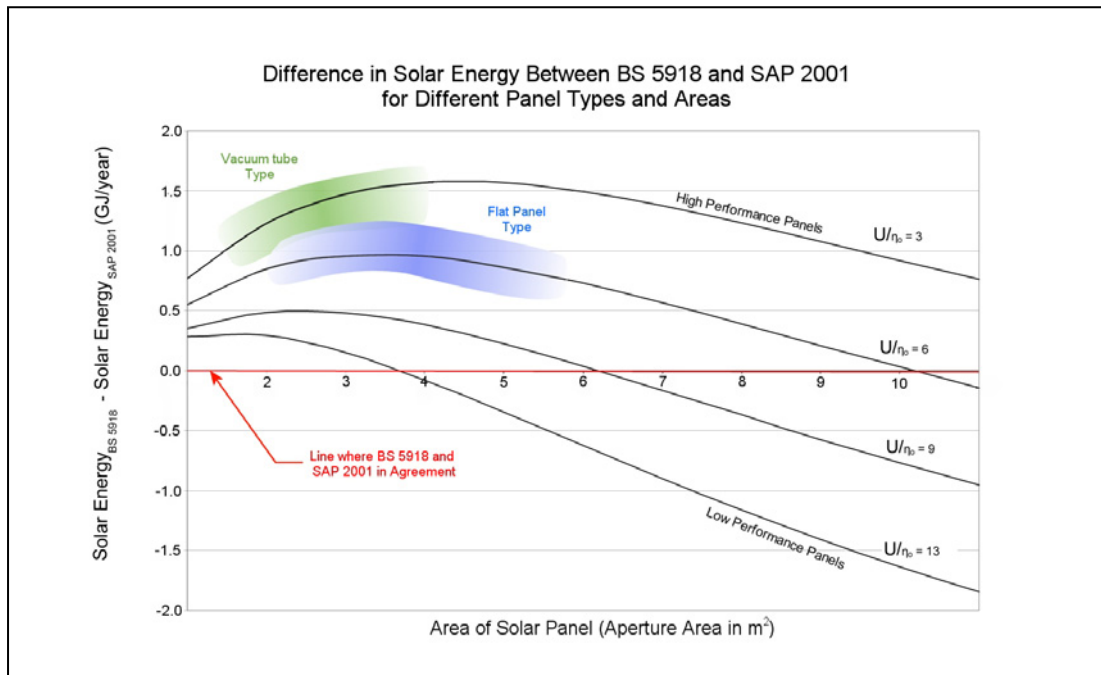
## Comparison of SAP 2001 Solar Calculation With BS 5918:1998

The Standard Assessment Procedure (SAP 2001) calculation is an important guide to house builders choosing the right balance of carbon-reducing measures. Section 4 of the SAP Worksheet includes provision for solar panels with an estimate of the energy they save.

The SAP 2001 calculation of the energy from solar panels is based on Figure 4 of British Standard BS 5918:1998<sup>1</sup>. Figure 4 itself is derived from the empirical method given in Appendix D of the standard.

Viridian has compared the two methods across a range of solar panel types and sizes.

**It appears that the SAP methodology produces estimates that are significantly lower than BS 5918 for solar installations of a type representing common practice.**

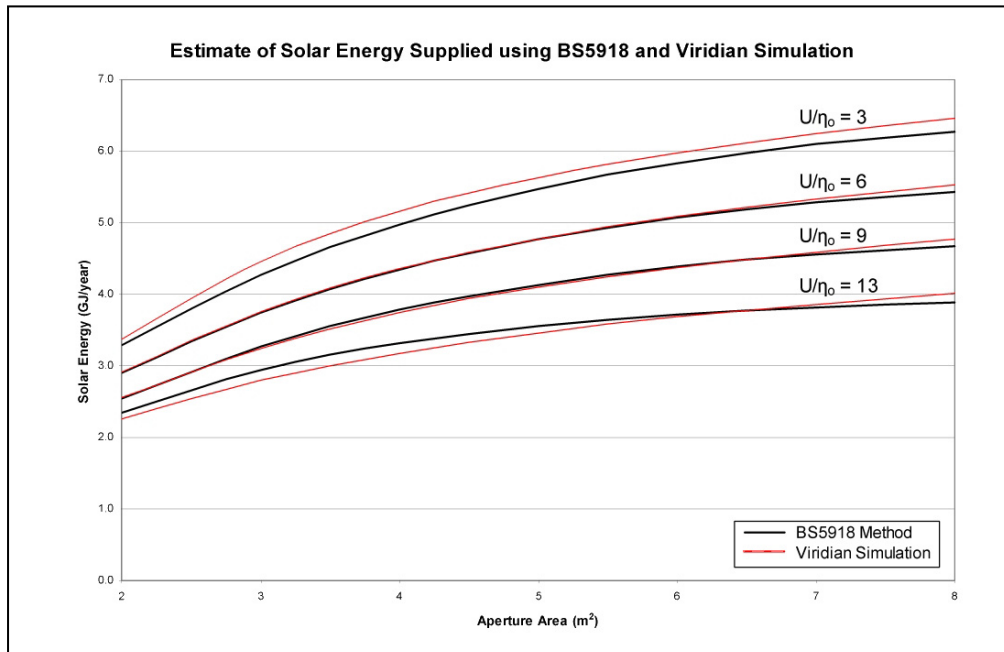


The graph above shows the difference in calculated energy between BS 5918 and the SAP as the area of the solar panel is increased. It is calculated based on a SW facing solar panel near London and a demand of 150l per day of water at 55C. The four curves are for solar panels of different performance. Please see *Supplementary File 1* for further detail.

The red axis indicates the situations where the SAP is in agreement with BS 5918 - for small areas of very low performing solar collector or relatively high areas of average performance collector. Regions marked in green and blue represent performance of commercially available solar systems and the area of collector it is common practice to specify. This is based on analysis of performance data for 204 commercially available products (see *Supplementary File 2*).

**It appears that for most commercial solar panels the SAP calculated energy is 0.75 to 1.5 GJ lower than BS 5918. This is significant proportion of the 2.0-3.0 GJ annual energy estimated by the SAP.**

Viridian has developed a theoretical simulation model for predicting the solar energy produced by a solar panel and system. As can be seen from the graph below the Viridian simulation is in good agreement with the British Standard across a wide range of panel types and sizes.



### Wider Applicability

Repeating the exercise with a lower household demand of 100l of hot water per day at 55C yielded results that followed a very similar pattern, albeit with a reduced absolute difference.

### Other Considerations

The preceding analysis has only considered the use of BS 5918 in a strictly comparable way to the SAP. However, it should be noted that the worked examples in the British Standard indicate that distribution losses and storage tank losses should be added to the hot water demand when calculating the total household demand.

Inclusion of these factors would add another 0.1-0.2 GJ to the discrepancy.

### Notes

1. Personal communication with Chris Roberts, Clear Skies Programme Manager, BRE. 7<sup>th</sup> April 2004

#### FOR FURTHER INFORMATION

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