

## **SAP development debate 19<sup>th</sup> September 2014.**

### Attendees

#### **SAPSIG members:**

Robert Lowe (RL) [Group chair]  
Martin Searle (MS)  
Neil Cutland (NC)  
Tassos Kougionis (TK) [standing in for Tessa Hurstwyn]  
Malcolm Bell (MB)

Apologies for absence - John Counsell

#### **DECC:**

Alan Christie (AC)

#### **BRE:**

John Henderson (JH)  
Will Griffiths (WG)  
Bruce Young (BY)  
Les Shorrocks (LS)

Apologies for absence – Brian Anderson

#### **Other Stakeholders:**

Paul Decort (PD) (DCLG)  
Giorgia Franco (GF) (AECOM)  
Dyfrig Hughes (DH) (NES)  
Cassie Sutherland (CS) (OFGEM)  
Ross Holleron (RH) (Zero Carbon Hub)  
Nick Howlett (NH) (FETA)

***The purpose of this meeting was for the “other stakeholders” to debate with SAPSIG, DECC, and BRE a number of SAP development issues which had been discussed in a SAPSIG meeting earlier in the day. The briefing note for both meetings is appended to these minutes.***

### Introductory presentation

RL opened the meeting by welcoming the “other stakeholders” and inviting all meeting participants to introduce themselves.

LS gave a short presentation covering the background to the meeting, intended to remind attendees of the six issues for debate which were contained in the briefing note that had already been circulated. Following the SAPSIG meeting it had been decided that only five of the topics should be debated in this meeting (“Issues of liability” was to be excluded). The

discussions on these topics are summarised below (in the order in which they were presented in the briefing note rather than in the order in which they were discussed).

#### Relationship between Appendix Q and RdSAP

RH asked whether the problem being debated was the fact that there are two versions of SAP (RdSAP applying to existing dwellings and SAP applying to new dwellings) and that the results from the two will differ. AC clarified that the issue was whether new technologies could be brought in more quickly to RdSAP and indicated that the drive behind this was related to Green Deal (for which RdSAP is used rather than SAP).

PD noted that for post-2008 dwellings any SAP calculation should be undertaken with full SAP. AC said that it was a general principle that once assessed using full SAP a dwelling should continue to be assessed in future using full SAP – it was not recommended to use RdSAP for dwellings that had already been assessed with full SAP.

NH felt the terminology being used was confusing and DH asked what problem we were trying to solve.

It was clear from these opening discussions that there was still confusion and it was clarified again that the problem was essentially about getting new measures into RdSAP via Appendix Q and this was needed because Green Deal uses RdSAP – i.e. it was essentially about keeping Green Deal as simple and low cost as possible.

RL noted that the earlier SAPSIG discussions had highlighted that more thought was needed regarding modifying the way SAP works, to reduce the barrier between SAP and RdSAP.

GF asked whether there was any way of reducing timescales to allow an annual update to the Product Characteristics Database (PCDB). BY noted that the problem was that a new PCDB structure was needed in order to incorporate any new products, and the software would then have to be re-written to read the file. Software was therefore constrained to be fixed for a period until the PCDB could be updated (and this was linked to the Building Regulations changes).

JH noted that fixed and updateable versions of SAP could in principle exist in parallel provided it was very clear what they are to be used for.

No real conclusions were reached but the following were noted:

**PD suggested that a flow chart would be helpful to visualise the processes that have to be gone through. AC indicated that he had a diagram that might help and he would send it to LS for circulation.**

**ACTION: AC to send diagram to LS for circulation**

**DH agreed to write a short note regarding the issues surrounding software updating.**

**ACTION: DH to prepare note on issues surrounding software updating**

### Faster Appendix Q2 process for low risk products

AC introduced this topic noting that the question was whether an alternative SAP 'Appendix Q2' application process should be adopted allowing new technologies to be recognised in SAP using a simple and quick assessment method.

RL added that Appendix Q was a faster way of getting new products into SAP. What was being discussed here was an even faster way.

CS said that this would be attractive as regards ECO product applications but she noted that any change in score due to a later downgrading of an in-use factor would be problematical. WG noted that any change in the in-use factor was likely to be in the opposite direction towards better performance, because the initial assumptions would be deliberately very conservative. Nonetheless, CS still felt there was a high risk of challenges to such changes being made.

AC noted that there is an equity issue here as well – i.e. what products could be allowed and what products could not?

MB noted that each product has its own “dynamic”, meaning, for example, that if a product is going to take two years to take through the Appendix Q process then that is how long it takes and that should just be accepted. In other words, we should not be trying to shortcut the process via such a faster but less robust route (this was the recommendation of the earlier SAPSIG meeting).

RL suggested that it might be possible to place restrictions on the number of installations that could be undertaken before a product has to go through the full Appendix Q assessment (to avoid ending up with lots of potentially useless products saturating the market).

JH cited the example of voltage optimisers for which following such an “Appendix Q2” process would have given them a part of the saving that was being claimed, but the full analysis, which took a substantial time to undertake, revealed that they were actually not worthwhile. In other words, there is a “line of least resistance” with introducing this sort of even faster approach but it has to be recognised that this carries dangers. MB supported this view saying that the process of assessing a product should either be done properly or not at all.

From a manufacturer perspective, NH noted that there is a price for every market you enter and problems can arise with manufacturers from other countries if their products are treated differently. Thus, he felt that there was a need to take Appendix Q further and make it more open. RH commented that doing this would imply spreading the workload, which could potentially make Appendix Q work the way that was originally envisaged. It would be important to “keep the gateway high” but to involve more people, implying a need for more funding (which raised the unanswered question of from where this funding would come). RL suggested that potentially there may be a role for a body such as Carbon Trust in administering an expanded Appendix Q scheme.

No conclusions were reached.

### “De minimis” provisions in Appendix Q

It was first noted for the sake of clarity that the term ‘de minimis’ was effectively being used to mean “things that are too small to be worth considering in SAP”. This meant that certain products/technologies could potentially be excluded from SAP, although they could still be allowed under individual schemes/policies.

CS confirmed that under the ECO scheme there was no means of excluding products – anything that could save energy, however little, would in principle still be eligible.

GF asked whether anyone could be stopped from applying for recognition under Appendix Q – to which the answer was “probably not”, although they could be informed that initial feasibility work indicated that the product was likely to produce negligible savings, so it would not be worthwhile proceeding further. The initial feasibility study, of course, carries a cost and AC said he would think about whether such costs could somehow be borne by the overall SAP Appendix Q process.

NH asked whether there was “a barometer” for assessing whether a saving was sensible or not (there is not), saying that there was a need to establish some thresholds and that these should be provided in guidance.

Returning to costs, MB noted that the cost associated with administering any ‘de minimis’ process associated with Appendix Q could be funded at the policy level or at the SAP level. Doing so at the SAP level, however, seemed unreasonable because it provided no gain whatsoever to the core SAP work but simply created a “stick for our backs”.

The discussions indicated that there was no clear view on whether there should be a ‘de minimis’ level or how it should be defined. No conclusions were reached.

### Publicly available “live” working version of SAP software between official versions?

Although the idea of introducing a core calculation engine had not been favoured by much of the stakeholder group discussions (see later) there was a general view that having a version of cSAP that was kept up to date would be helpful. The SAPSIG meeting had noted dangers with such a tool suggesting that any “live” working version (or “development” version) would need to be restricted to academia/industry since a wider availability could lead to loss of control as well as potential confusion. But provided it was carefully restricted in this way it would be useful.

MB noted that people who have written their own spread sheet implementations of SAP could use these to quickly assess the effect of changes - and it would be useful if this facility could be replicated in any “live” working version.

RL noted that the case for and against open source software was finely balanced. On the one hand the SAPSIG meeting had strongly cautioned against such a move but there were nonetheless points in favour:

- The present written spread sheet specification was hard to follow; open source software could overcome this

- An open source approach would be good for documenting SAP
- The consultation version is something that people are generally in favour of
- It would provide a platform for software providers

DH noted that a change to the way SAP is specified would help - so an accompanying specification to the open source software would be welcome.

### Issues of liability

Following the earlier SAPSIG meeting it had been decided not to discuss this issue.

### Move to a fixed core calculation engine for SAP

RL introduced this topic noting that the SAP specification existed as a pdf document which software developers were then coding up themselves. This was leading to inconsistencies between implementations and potentially also errors in interpreting the specification. Core software could potentially solve such problems.

PD noted that core software was an approach adopted for SBEM and this had advantages as just outlined. The potential disadvantage was that the core software could just appear to be a black box to the ordinary user. However, PD noted that for SBEM there was already a degree of transparency available on the NCM website.

[Following the meeting PD provided the following specific details: From the download page at [www.ncm.bre.co.uk](http://www.ncm.bre.co.uk) the NCM Modelling Guide and SBEM Technical Manual for all versions of SBEM can be downloaded and scrolling to the bottom of the page also allows text of the C++ coding for version 4.1e to be downloaded.]

RL emphasised that making the source code available was another proposal that needed to go along with introducing core software.

MB noted that some accredited SAP software had been found to contain errors in the core engine.

DH was asked to offer the perspective of software providers. He noted that introducing core software had a lot of implications. Points to bear in mind were:

- The present arrangements mean that there is a body of knowledge present in organisations involved in software development – they are deeply involved in the code
- There is a danger that this knowledge would be stripped out of the industry if core software were introduced
- Smaller software suppliers, without the level of knowledge noted above, would be empowered by the availability of core software and there is a risk that the quality of available software would decline as a result

- There are issues about accuracy. Present arrangements mean that bugs in the core calculation are more likely to be identified and rectified – i.e. there is a peer review process in place. Core software could risk there being bugs present that are not identified.
- Batch processing is impeded by having core software
- There would be a lack of transparency with core software (SBEM was cited as a case in point with communication felt, by software providers, to be lacking – e.g. nothing published)
- Calculation engines nowadays need to run on many devices and that would present a challenge for a core calculation engine
- It would be better to find out what the problems are from the industry and to work with providers rather than imposing something
- Introducing core software would help those software providers that are not very good at software development

DH went on to say that the problem for software providers currently (referring largely to Green Deal) is that specifications are provided too late, testing is delayed, and deadlines are not clear and are not adhered to. He noted finally that there is a lot of good practice in the software provider industry and it makes sense to utilise this.

**RL summarised DH's comments saying that the message was that the benefits of diversity outweigh the benefits of a single core engine. DH was invited to set his arguments out in more detail in a short paper.**

**ACTION: DH to prepare a short paper.**

# Briefing note for the meeting (circulated in advance)

## SAP Development Debate

### Background

The National Calculation Method for energy rating of dwellings (SAP) is an assessment tool that has an important role to play in the delivery of several Government policy initiatives. These roles include:

- Building Regulations for England and the Devolved Administrations for the Parts that relate to the conservation of heat and power - it was first cited in Part L of the Building Regulations for England and Wales as a means of assessing dwelling performance in 1994; in 2006 SAP became the only method of demonstrating compliance
- HM Treasury's Stamp Duty exemption for zero carbon homes
- Department of Finance and Personnel for Northern Ireland Rate Relief Regulations for low and zero carbon homes
- As a National Calculation Methodology, as specified by the Energy Performance of Buildings Directive, SAP and its derivative Reduced Data SAP (RDSAP), which was developed in 2005, is used to produce Energy Performance Certificates
- To calculate the maximum allowable level of Green Deal finance for energy efficiency improvement measures
- To calculate Renewable Heat Incentive payments
- As an important element of the Code for Sustainable Homes score
- To calculate savings for measure installed under the Energy Companies Obligation (ECO)
- To calculate savings for measure installed under Warm Front
- To produce figures for local authority stock reporting, etc.

Furthermore, SAP has a consumer protection role. In general, consumers have neither expertise nor effective representation in matters related to the above policies. It is therefore essential that there is impartial and unbiased assessment via the NCM.

Thus, SAP helps DECC fulfil its duties to consumers, who might otherwise be misled by exaggerated manufacturer claims, potentially encouraging or forcing them to purchase products of little value (e.g. purchasers of new homes effectively paying for such products because the designer found they were the cheapest route to achieving Part L compliance). This emphasises that it is important that the default performance factors for technologies in the NCM are markedly conservative estimate of the typical performance of a range of products in that technology; and the measured performance of a particular product is tested against the same assumptions as everything else in the notional house as opposed to circumstances more favourable to its performance. In particular for Green Deal, Green Deal providers need a level of assurance that the financing instrument can be met from energy savings.

Assessing the performance of an energy efficiency measure is complex and it may not always be possible to describe it in terms of a single number for comparison purposes. In such instances the assessment of performance is only possible using whole-building assessments that utilise specific product performance data.

Energy Performance Assessments to deliver the Green Deal policy and most objectives in the ECO policy are undertaken using RdSAP (Reduced Data SAP), a simplified version of the SAP method that can be carried out more quickly and cheaply. The SAP method is used for new-build Building Regulation compliance and some ECO objectives.

In order to assess a dwelling's energy performance, information is needed that enables the assessment of the building fabric and building services. Such data is either generic, determined by the materials and type of product used ('type data') or specific, where validated individual branded product performance data has been made available ('product data'). Product performance data is normally held in the Product Characteristics Database (PCDB). Both SAP and RdSAP can read data held in the PCDB.

Typically, the performance of a product recognised as a new technology is initially assessed using data held in the Appendix Q database and undertaken as an adjunct to the SAP assessment. Consequently, this information cannot currently be used in RdSAP assessments, which use a simplified version of the SAP assessment developed for assessing existing dwellings. Product performance data held in the SAP Appendix Q database will generally migrate to the PCDB when a new version of SAP/RdSAP is released, enabling RdSAP assessors to access this data.



## Questions for debate

DECC has requested that BRE set-up a workshop session to discuss the following issues that affect the delivery of Green Deal and ECO policies, but are also critical to SAP's ongoing success. Item 3 is probably the most crucial of the issues:

### 1. Relationship between Appendix Q and RdSAP

How should we get new technologies into RdSAP more frequently, having been through an Appendix Q type process, now this is potentially to be updated annually?

We need to consider what principles can be applied such that RdSAP can be updated annually with information in Appendix Q before the 3 yearly update with SAP. We need to consider the pros and cons of how this might be achieved.

### 2. Faster Appendix Q2 process for low risk products

Should an alternative SAP 'Appendix Q2' application process be adopted allowing new technologies to be recognised in SAP using a simple and quick assessment method developed by BRE? Such an approach would need to encompass the following principles:

- a. It would need to impose a sufficiently conservative 'in-use factor' in the model (e.g. reducing savings by 50%) to downgrade the performance in lieu of a more detailed analysis being conducted
- b. Technologies could migrate to recognition via the standard Appendix Q application process in due course (with a lower or no 'in-use factor')
- c. The process would still require a robust naming and identification system (as per standard applications) such that SAP assessors can identify the technology for assessment purposes. This often takes time to develop.
- d. The process could only be adopted for technologies that pose minimal technical risk during and after installation.
  - i. One example could be a complex product that required complex technical documentation incorporating system design and installation guidance and training. In this case, BRE would need to undertake assessments of sufficient rigour to ensure energy savings could be delivered in practice. In this instance it may be that such technologies should not be recognised
  - ii. Another example could be a simple controller, where the only technical risk is correct identification by the SAP assessor

### 3. "De minimis" provisions in Appendix Q

The development of a 'de minimis' level of energy savings, whereby applications for recognition of new technologies within SAP would go through a still simpler Appendix Q process; or alternatively, be rejected for inclusion in SAP/RdSAP if potential savings were

below an agreed threshold. This is a crucial matter for on-going development of SAP, Green Deal and ECO.

The key issue is whether the benefit (in the form of energy saving) is disproportionate to the difficulty and cost of analysis to the manufacturer, where the result is unlikely to affect the SAP rating.

4. Publicly available “live” working version of SAP software between official versions?

It is necessary to have a version of SAP that is fixed for several years to support Part L of the building regulations. Would there be merit in maintaining a concurrent publicly available ‘development version’ of SAP which could be adjusted between official versions of SAP to incorporate new methodology? Potentially this could be used to support Appendix Q, by providing a means to include technologies not yet in full SAP. This would have the advantage of providing a ready-made consultation version of SAP (currently ‘cSAP’ is produced specifically for each consultation). If so, would there be any negative consequences for commercial software providers, or others?

5. Issues of liability

A number of situations can be envisaged when issues of liability could potentially arise. For example, who would be liable if:

- A Technical Note contained something that was incorrect.
- Changes were made to SAP as a result of an error being identified (e.g. perhaps an error in a PCDB data entry).
- PCDB records were removed or amended as a result of audits.....

6. Move to a fixed core calculation engine for SAP

At present each SAP software provider produces their own SAP calculation engine. This results in a possibility of inconsistencies between different versions of software and entails duplication of effort by software companies and additional software testing costs. Would it be better to produce a single core engine to be used by all SAP software, while still allowing software companies to compete on the quality of their interfaces? Would there be any disadvantages to this approach?

As an adjunct to this, one possible benefit is that it would be easier with a core software model to start to model dynamic situations, for example where several heat technologies supply heat to a cylinder in different circumstances. The downside is that the transparency of SAP may be compromised.