



**Department for Business, Energy and Industrial Strategy
consultation**

**Proposed changes to Government's Standard
Assessment Procedure (SAP)**

Submission from CIBSE

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The Chartered Institution of Building Services Engineers (CIBSE)

- CIBSE is the primary professional body and learned society for those who design, install, operate and maintain the energy using systems, both mechanical and electrical, which are used in buildings. Our members therefore have a pervasive involvement in the use of energy in buildings in the UK with a key contribution to sustainable development. Our focus is on adopting a co-ordinated approach at all stages of the life cycle of buildings, including conception, briefing, design, procurement, construction, operation, maintenance and ultimate disposal.
- CIBSE is one of the leading global professional organisations for building performance related knowledge. The Institution and its members are the primary source of professional guidance for the building services sector on the design, installation and maintenance of energy efficient building services systems to deliver healthy, comfortable and effective building performance.
- The Homes for the Future Special Interest Group aims to inform and promote best practice in building services when constructing or renovating better homes. The main areas of interest are energy strategies and services for new and refurbished homes, and their integration with overall fabric and design.
- The special interest group has identified a need for guidance on good practice building services design and environmental design for the homes sector which includes houses, apartments and care homes. To address this, in 2017 a Technical Memorandum on the best practice in the design of homes will be published, offering guidance on preferred design practice relating to building engineering services and the approach to environmental design. It will contain a detailed methodology for the assessment of overheating in the design of homes.
- The CIBSE Combined Heat & Power (CHP) & District Heating (DH) group raises awareness and disseminates knowledge about both the technical and economic aspects of CHP including both conventional equipment and new developments such as fuel cells and micro CHP.

General Comments

CIBSE supports proposals to increase the accuracy and scientific basis for the SAP calculation methodology. This gives designers, constructors and clients better assurance that there is an evidence basis for the way carbon compliance is assessed. There is a general need to ensure improved compliance, more rigorous enforcement of Building Regulations and for greater diligence in the building control industry to drive higher quality residential development. At the same time as rigour is increased however, it does imply that competency in the assessment and checking process needs to increase. We would recommend that mechanisms to check the competency of assessors, the SAP certification bodies and building control officers are reinforced. This may require additional monitoring in order to limit performance gaps that can arise from the Part L assessment and construction activities on site.

1. Do you agree with the proposal to use the methodology set out in the technical working paper for calculating carbon emission factors and update the figures?

Carbon emission factors can unfairly skew people towards certain technologies and we should be aware that this can make SAP appear to not be technology agnostic. Average grid factors are not necessarily representative of what certain technologies are achieving and contributing in terms of carbon reduction.

There should also be careful consideration of wider infrastructure implications if there is a significant shift to electric heating due to decarbonisation of the grid. The consequences of the proposal for grid displaced electricity, energy from waste and biomass need further consideration (possibly taking into account the proposed revisions to the EPBD, which may come into effect before the UK leaves the EU, and should therefore be considered for transposition into UK law).

We recommend the Department for Business, Energy and Industrial Strategy undertake an infrastructure impact assessment to investigate the potential increase in electricity demand.

2. Should we keep the current set of heating patterns set out in SAP or move to using two heating periods every day of the week? Please provide supporting information for your view.

We agree with the proposal to change heating patterns in line with the evidence to reflect a more typical heating pattern of having two heating periods every day of the week including weekends.

Although we do not have any additional information, we encourage ongoing collection of data to inform analysis and note that the surge in the market for smart controls presents an opportunity to do so.

3. Do you agree with the proposal to amend default Distribution Loss Factors for Heat Networks?

We agree that the default Distribution Loss Factors for Heat Networks should be amended as accurately reflecting reality is a priority. We support the use of the CIBSE/ADE Code of Practice to encourage high quality heat networks.

We have the following observations:

- i) There is an inconsistency in losses from heat network (HN) designed in accordance with the CIBSE Heat Network Code of Practice (CoP implies 30% distribution loss, proposed SAP methodology implies 50% losses) - clarity of the calculation process would be appreciated
- ii) The design stage assessment should allow the same inputs as per the proposed as-built assessment rather than a default factor of 1.2 to prompt assessors and designers to interrogate distribution losses at design stage when changes can be incorporated into the design as necessary.
- iii) Input of a calculated DLF should be the preferred option.
- iv) It will also be important to define the boundary of the DLF, i.e., from boiler/heat generating source to the end customer i.e. up to the dwelling, inside the building, otherwise this may be subject to adjustment to obtain desired outcomes.
- v) It is important that the as-built assessment process is rigorous and evidenced. The as-built assessment review should interrogate the design assessment information and require sufficient evidence to verify the distribution losses are in line with the selected distribution loss factor stated.
- vi) Given that the proposed change will potentially result in greater competency required by the Part L assessor and the Building Control agencies we recommend that the Government increases the level of interrogation of the quality of the assessor bodies and supporting the training of Building Control agencies because insufficient competencies in assessing district heating network losses would result in poor enforcement of Part L.
- vii) We recommend the government assess the impact on the government's own heat strategy policy.

4. Do you agree with the proposal to change the way that lighting is calculated in SAP?

We agree with this proposal to change the way that lighting is calculated as it is more detailed and rigorous.

5. Do you agree with the proposal to remove the default values in Table K1, review default values as proposed, and recognise Certified Thermal Details and Products schemes? Do you agree with the proposal in due course to amend the default y-value to 0.2?

We agree with the proposal to remove the *approved* values in Table K1. The database of Certified Thermal Details and products should be monitored and updated to enable the inclusion of new details such as curtain walling.

We agree with the proposed amendment of default psi-values and that the individual psi-values seem reasonable. Furthermore we agree with the proposal to amend the default y-value to 0.2, providing that the default figure always provides a worst case scenario.

We suggest that the individual calculation of thermal bridges is preferred and that the default y-value should be the last resort. We have observed that the default y-value has in some instances proved more favourable to overall performance than the sum of the measured thermal bridges and corresponding psi-value. It was suggested that sensitivity testing should be undertaken and the default y-value adjusted as necessary so to avoid the potential scenario where a less-competent assessor may be inclined to choose the default y-value in order to achieve a better result.

We note the need for effective assessment of calculated psi-values by competent persons and the effective inspection by Building Control in order to ensure that design intent is continued through the construction process.

As pointed out in the response to Q.3 we highlight that a higher level of checking will be required of the competency of domestic Part L assessors and Building Control agencies, given the potential additional complexity, and recommend that the government consider how this can be managed and resourced.

6. Do you agree with the proposals to adjust U-values and Ψ -values for elements next to unheated spaces?

We agree with these proposals, however there are issues with internal spaces that are surrounded by heated spaces e.g. corridors which often overheat and do not behave in the same way as other unheated spaces such as garages. Indeed overheating in internal corridors can be a real problem in modern apartment blocks. In reality temperatures in internal corridors are similar to the temperatures in the dwellings themselves (or can be greater). We

recommend there should be a differentiation between an internal corridor which is surrounded by heated spaces and a corridor that is adjacent an unheated space such as a garage or cold plant room or the corridor is a sheltered walkway.

7. Do you agree with the proposal to change the default U-values for walls for existing buildings in RdSAP?

We agree with the proposal to change the default U-values for walls for existing buildings as it is based on evidence that better reflects reality.

8. Do you agree with the proposal to amend the hot water methodology in SAP?

We agree with the proposal to amend the hot water methodology and suggest that it could be linked to the Building Regulations Water Efficiency Calculator.

9. Do you agree with the proposals to change the questions in the assessment of internal temperature in summer (Appendix P)?

Whilst we support the proposed changes relating to noise pollution and security risk and consider these changes a positive step forward in a more thorough assessment of the potential for natural ventilation in summer. We propose that an additional question regarding 'security risk' is also included. This question would be specifically aimed at identifying whether window stays are installed on openable windows, which could significantly reduce air movement. Project experience shows that window stays are commonly installed on mid- to high-rise apartment blocks, but easily overlooked in a SAP assessment due to developers not providing appropriate information unless specifically asked. An additional question relating to 'security risk' would provide the assessor with a specific prompt to allow them to identify if window stays are proposed early on in the design process.

We also recommend changing the name of this section from being called 'assessment of internal temperature' to a 'heat gain check'. The terminology currently oversells what is being checked and the language in Appendix P can be confusing. It should not be seen as a confidence assessment as a list of questions cannot sufficiently investigate overheating risk in homes. This is a simple check and detailed thermal dynamic analysis would normally be required to establish risk magnitude and mitigation options. CIBSE will be publishing a detailed methodology for the assessment of overheating in the design of homes as part of a new Technical Memorandum later this year.

10. Do you agree with the proposal to amend the treatment of Mechanical Ventilation Systems in SAP?

We agree with the proposals as these better reflect reality. In addition to the above we agree that further work should be undertaken to investigate the effectiveness of by-pass dampers in MVHR as these could influence heat gain checks.

11. Do you agree with the proposal to change the assumed air flow rate for chimneys and flues in SAP?

The group did not comment on these proposals.

12. Do you agree with the proposal not to alter assumptions on storage heating secondary fractions in SAP?

We agree with the proposal not to alter assumptions.

13. Do you agree with the amendments proposed to solid fuel heating efficiencies?

We do not have any contrary information and therefore agree with the proposals.

14. Do you agree with the proposal to amend the procedure for determining overshadowing of solar PV installations?

We do not have any contrary information and therefore agree with the proposals.

15. Do you agree with the approach to adjust the carbon savings where solar PV electricity is used in the home to heat water or where it is put into battery or other storage? Do you have a view on the correct export tariff for PV electricity exported to the grid? Do you have ideas on how solar thermal space heating, or storage of solar PV or hot water through a battery or other medium can be modelled?

We agree with the proposals to adjust the carbon savings where solar PV electricity is used in the home to heat water or where it is put into battery or other storage. We support further research on assessing and promoting the case for storage systems in compliance. Solar thermal heating requires additional, separate research.

16. Do you agree with the proposal to provide a series of seasonal efficiencies for boilers on the Product Characteristics Database dependent on the controls they use and the design flow temperature of the system? Do you agree with the proposed change to the Energy Balance Validation method?

We agree with the proposals.

17. Do you agree with the proposal to amend the default values for some heat pumps based on evidence from RHPP field trials?

We agree with the proposals, but note the need for consideration of larger ASHPs for community systems, which are not currently considered in the product database.

18. Do you have any evidence on the technology costs used in RdSAP?

We do not have any evidence on the technology costs used in RdSAP, but would support research.

19. Do you have any evidence to update the assumptions that SAP makes about heating controls?

We would support the gathering of data from smart controls and the potential to include in future SAP revisions.

20. Can you provide any evidence on the cost and benefits to business of revisions to SAP independent of changes to any particular set of Buildings Regulations?

We noted that there is a notable uplift in the evidence required to demonstrate as-built performance and that this would come at the expense of the SAP assessor as it may be difficult to reflect in assessment costs to developers.

It was noted that that there should be a greater emphasis on as-built checking and auditing of information, as per previous comments, and that one way this should be achieved is through better resourcing of building control officers. We recognise that that this will incur a cost uplift, which we suggest could be covered by developers.

As previously mentioned an infrastructure impact study should be undertaken to evaluate the impact of the proposed changes which may make electric heating systems appear more favourable and therefore result in an influx in demand on the mains grid network.