



Building Standards Energy review

Consultation proposals – Frequently asked Questions and Clarifications

During September and October 2021, a series of online engagement events took place to discuss the proposals within the consultation on review of energy and ventilation standards within Scottish Building Regulations. That consultation is published [here](#).

This document collates questions and answers that have been posed at or outside consultation events and also clarifies a number of points within consultation proposals.

It is intended that this document will provide a summary of the key points raised in discussion to assist consultees in offering a more informed response to proposals before the consultation closes on the 26 November 2021. Questions are listed under the relevant section of the consultation (Parts 2 to 7) and by topic. Further information is provided in annexes to this document.

Note: in relation to Part 6 'Improving and Demonstration Compliance', a broader consultation on this topic – ['Building regulations - compliance and enforcement'](#) is now published for comment.

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Part 1 – Introduction

1. Further information on timetable for implementation

Q. Clause 1.3.5 of the consultation document notes amendment of Building Regulations and supporting guidance in late 2021 and bringing changes into force in 2022, with proposals for electric vehicle charging provision subject to further development and implementation during 2022. Is there any more information at this time on an ‘in-force date’?

A. At present, the anticipated timetable for implementation of any changes arising from Parts 2 to 6 of the consultation is publication of standards and guidance in February 2022, with implementation following a six months lead-in in August 2022. Noting again this is subject to confirmation by Ministers following the end of the Consultation. Action on Part 7 (EV charging infrastructure) will be progressed separately.

2. Availability of Section 6 compliance software

Q. Will there be a phasing in period where the new Section 6 compliance software (including DSM such as IESVE) is readily available prior to the new regulations going live, i.e. to allow the design teams to test the concept or planning stage proposals against the new Section 6 energy targets?

A. It is intended that standards and guidance will be published six months prior to coming into force. The intention is that software tools will be available as soon after this publication as is practicable. We will be working with software developers to enable this.

3. Why are further improvements to newbuild standards sought?

Q. Why are the Scottish Government considering new buildings in the context of net-zero requirements when they are already being constructed to a good level of energy performance?

A. The Scottish Government has committed to ambitious carbon reduction targets, with a target for Scotland to reach net zero carbon emissions by 2045. To meet this target, all sectors need to deliver improvement to the extent that this is practicable – this will include both newly-built and existing buildings.

Accordingly, this current review seeks your views on proposals to further limit energy demand and emissions from new buildings and new building work, based upon what is currently considered practicable and achievable at a national level.

4. Impact of decarbonisation of heat and introduction of EV charging.

Q. Will the electrical grid have enough capacity to cope with the additional demand from decarbonised heating and electric car charging infrastructure?

A. This review will retain the option to use any fuel or heating system for new buildings. It is the [New Build Heat Standard](#), programmed to take effect in 2024, that will call for zero direct heating systems to be installed in new buildings.

The Scottish Government is working with Ofgem and DNOs to unlock investment in network infrastructure to support the connection of zero carbon heating solutions onto the electricity network.

SG have worked closely with Scottish Network companies to support successful bids to the Ofgem green recovery funding, and £40-50m of this fund is being allocated to projects in Scotland. This will support further innovation in green energy, unlocking capacity in our networks.

5. Absence of proposals to address embodied emissions within review.

Q. Why is embodied carbon not being considered, rather than operational carbon in use? As there is a risk the regulation changes could end up with a greater carbon footprint as a consequence of (increase in) embodied carbon being greater than the savings in operational carbon.

A. It is welcome that there is a growing awareness of broader environmental impact arising from the design and specification choices developers can make and awareness and action on this topic is encouraged.

As with any emerging topic, the potential for regulation arises where industry good practice alone does not address an issue. There are both Scottish and UK initiatives in this area.

Part 2 – Energy, new buildings

1. Correction to cost information in Domestic research paper

Q. In the cost breakdown of the [domestic research paper](#) (table A.1) it appears a higher specification roof or window costs less than a lower specification?

A. There was an error transposing information from the supporting cost data set into the research report. The correct data is now provided in the table in Annex A to this document.

2. Fuel Choice Options for 2022

Q. Will there be limitations placed on the type of fuel that may be used to heat new buildings?

A. No, whilst there are less fuel specifications used for setting the notional building targets, designers retain flexibility in fuel choice. There is no prescription against the continued use of solutions such as mains gas, oil or LPG at this time. Such change will form part of the 2024 [New Build Heat Standard](#).

3. Non-domestic Buildings - carbon factors

Q. Will there be limitations placed on the type of fuel that may be used to heat new buildings? We are keen to understand how the decarbonisation of Grid Electricity will be recognised in the Non Domestic Energy Standards. We note that SAP 10.1 is proposed for Domestic, however is there an equivalent SBEM update using lower carbon factors?

A. Information on amended carbon factors within the published consultation version of SBEM can be found on page 45 of the draft NCM Modelling Guide for Scotland.

Values cited remain UK values and are generally the same as for SAP 10.1 except where BRE have assessed that the non-domestic fuel mix dictates a variation – e.g. for heating oil used in ND buildings.

4. Air tightness testing - reason for increase in level of testing of new buildings

Q. What is the justification for going from sample air tightness testing to 100%?

A. Review of EPC data indicates around one third of new dwellings have been subject to an airtightness test and are commonly achieving air infiltration rates below 5 m³/(h.m²). As this level of airtightness requires greater consideration of the ventilation strategy to be adopted we consider that all new homes should be tested.

This would provide greater assurance that the infiltration rate actually achieved in the dwelling is a fair representation to that declared at the design stage. It will also provide assurance that the ventilation strategy adopted in the building is appropriate for the level of air infiltration present within the dwelling.

5. Air tightness testing - access to testing services in rural areas

Q. Have the Scottish Government considered the impact of moving to 100% air tightness testing in rural and island parts of the country?

A. Air tightness testing is already required throughout Scotland and it is expected that the increased demand for these services will be met by industry. Noting also that the level of testing on smaller developments is proportionately higher than on larger and, at present, single plot developments are always tested.

6. Air tightness testing – industry capacity to respond to change

Q. Are you confident that the industry will have the capability and capacity to move up to 100% airtightness testing?

A. Yes, early discussions with key stakeholders suggest industry will build capacity to meet the revised approach to airtightness testing. EPC data indicates 1/3 of new housing is already being tested.

Discussions with industry will continue so that we have assurance that the increase in airtightness testing can be delivered and consideration can be given to a phased introduction should industry need additional time to build capacity.

7. Air tightness testing – action where results differ from declared value

Q. What guidance is offered where an air tightness test delivers a result different from the declared design rate?

A. Guidance on remedial action following a test failure is provided within the Scottish Government's [Sound and air tightness testing](#) publication. This document will be further updated for 2022.

8. New homes & use of the iSAP tool – PCDB entries

Q. Some products available on the SAP 12 PCDB do not appear on the SAP 10 PCDB. Why is this?

A. The version of the PCDB was the same as was used for the consultations in other parts of the UK but was further upgraded in September. The version used by Scottish iSAP does now have most 'live' products from the 2012 PCDB.

9. New homes & use of the iSAP tool – understanding heat pump efficiency

Q. Is there information available which can assist in understanding how SAP assesses heat pump efficiency?

A. On the specific point around use of heat pumps and understanding how SAP converts Manufacturer's CoP data into a system efficiency based upon unit heat output versus building heat demand ('Plant Size Ratio'), BRE have pointed to an assistive resource on their website - <https://www.bregroup.com/heatpumpefficiency/index.jsp>, which they have noted may be useful to consultees.

10. Zero direct emission heat – described term.

Q. The term Zero Direct Emissions seems to be interchanged with 3 other terms "zero direct carbon emissions" and "zero direct greenhouse emissions" and "no gaseous emission at all" can this definition be more concise as hydrogen boilers will emit greenhouse gases.

A. Our consultation makes reference only to 'zero direct emissions' heat as the term used in the scoping consultation on the 2024 [New Build Heat Standard](#) (NBHS). For the purposes of the NBHS, we are seeking to ensure that there are zero direct greenhouse gas emissions produced from the heating or cooling system contained within a building (at the point of use). We are continuing to develop the NBHS, and we will set out a clearer definition of this in early 2022.

11. Zero direct emission heat – applicable solutions.

Q. What type of technologies or heating systems will be considered as a 'zero direct emissions' solution?

A. The main premise is that the solutions will not emit any emissions at point of use. Accordingly electricity and thermal energy from heat networks would be considered 'zero-rated' (i.e. considered to produce zero direct emissions at the point of heat consumption). With regards to energy which is supplied to new buildings via grid electricity, our proposed approach is to consider this to be zero-rated emissions as any emissions would occur upstream and these would be regarded as being the responsibility of electricity system actors - not the building owner/ user.

12. Zero direct emission heat – costs in operation.

Q. Is there a concern that moving towards electric as the primary fuel will increase energy costs for building occupants?

A. This review does not propose limiting fuel choice for developments. It is the 2024 [New Build Heat Standard](#) that is intended to limit heating system choice to those that emit zero direct emissions at point of use. Review of building regulations does seek to further reduce energy demand in new buildings.

Reporting on capital and ongoing costs within the [domestic research](#) published in support of the 2022 proposals does indicate a small increase in energy and renewal costs is likely (aggregated over a 60 year period) - see Table 1.14g.

13. Zero direct emission heat – capacity to support change from 2022.

Q. With a natural transition to ASHP technology, there is an industry shortage of skilled technicians for installation, service and ongoing maintenance. To support the skills gap in the face of the upcoming demand, are the SG working with manufacturers / industry to ensure there will be a supply for virtually all homes built from next year?

A. It is not envisaged that there will a significant shift in the dominant heating solutions employed in new buildings as a consequence of the proposed changes to the energy standards in 2022.

The [New Build Heat Standard](#) will drive significant change from 2024 and officials are working with industry to address the issue of skills and capacity to deliver this policy. We know the pace of the heat in buildings transition will require a substantial growth in supply chains, particularly in the availability of skilled heating and energy efficiency installers.

We have partnered with Scottish Renewables and Skills Development Scotland to undertake a 'Heat in Buildings Workforce Assessment Project' which will help us better understand the timing of workforce growth and how best to support people transitioning into key sectors, this work will report in Spring 2022. In 2020 there were 134 contracting companies based in Scotland accredited to carry out heat pump installations under the Microgeneration Certification Scheme. To date we have provided £164,700 capital investment in colleges in the north of Scotland (with funding in the South of Scotland covered by Scottish Power Green Economy Fund) for heat pump and insulation training equipment, this is helping to support young people train to install technologies such as heat pumps. We have also provided funding for through the Energy Saving Trust for heating engineers with an interest in installing heat pumps, to become MCS accredited.

14. Zero direct emission heat – exempting buildings from emissions target.

Q. It is proposed to exempt dwellings from the carbon standard in 6.1 if a zero direct emission system is used. Do you think there is a risk that this could allow dwellings to use high carbon fuels for other energy demands such as water heating which would then not be limited by the CO₂ standard?

A. The consultation refers to situations “where the heat and cooling requirements of a new building are met only by solutions which meets the definition of a ‘zero direct emissions’ heat source”. This would include both space and water heating.

15. Impact of proposals on on-site generation and issues with grid connections.

Q. With the increase in electricity import/export promoted through these proposals has the Scottish Government been liaising with Energy Providers/DNOs to ensure adequate capacity is available when developments start to come on stream?

A. The Scottish Government have been in contact with the network operators to make them aware of the consultation so they have an awareness of the potential impact new developments constructed to meet the new standard may have on the grid.

The notional building specification is intended primarily for the purposes of setting a compliance target that the actual building needs to meet. It is not intended to

promote one technology or design over another leaving the designer the flexibility to make informed design choices on how compliance can be met.

Limiting the assigned benefit from on-site generation of electricity to exclude any export component assists in better representing the direct benefit of solutions to a household. It is noted that this and changes in the carbon factors of fuels are not likely to increase current levels of specification of such technologies.

16. New Homes - assessment of costs – ventilation solutions in notional building.

Q. For the difference between the Improved and Advanced Notional Standard, has there been any work to understand the difference in maintenance cost for homeowners - e.g. Nat Vent vs MVHR?

A. Table 1.14g of the domestic research paper that supports this review provides information on lifetime costs for the options of improvement proposed in the consultation. The research paper (Improvements to energy standards for new buildings within Scottish building regulations – modelling report: domestic buildings) can be accessed [here](#).

17. New Homes – confirmation of final SAP specification.

Q. There have been 3 revisions of SAP 10 guidance and associated carbon factors. I understand heat network carbon factors are yet to be resolved. Can you confirm if there are likely to be any changes to other proposed carbon factors?

A. The carbon factors contained within version 10.2 are not to be further amended with the exception of those relating to heat networks. However, as noted in section 2.2.9 of the main consultation document, an alternative approach to handling connections to heat networks is proposed in so much as the characteristics of the fuels in the heat network will not be taken into account in determining the targets for primary energy or carbon emissions. Pending updates to SAP on this topic will not therefore affect the proposed compliance method under standard 6.1.

18. New Homes – reason for consideration of Primary Energy metric.

Q. Is the reason for using primary energy purely to align with EU directives? The PE factor of electricity is higher than gas which unfairly weights electricity when it seems the long term objective (2024 beyond) is to move away from gas and towards heat pumps which run off electricity.

A. The 2018 amendment to the Energy Performance of Buildings Directive called for member states to adopt Primary Energy as the main metric of compliance for building regulations. Whilst the Scottish Government wish to keep pace with EU legislation, consideration will be given to diverging from this where it is in the interest of Scotland to do so. Accordingly, we are seeking comments on the appropriateness of primary energy or delivered energy as a metric through question 1 of the consultation.

It is proposed to retain carbon dioxide as a metric within standard 6.1 in addition to primary energy, so account can continue to be taken of the benefits derived from heating systems that use lower carbon fuel.

19. New Homes – alternative methodologies – PassivHaus Planning Package.

Q. Will the passive house standards (PHPP) be accepted as an alternative to SAP for Building Standards compliance or will SAP always be required?

A. The scope of this consultation does not extend to the use of alternate calculation methodologies for compliance from the Government's Standard Assessment Procedure for Energy Rating of Dwellings (SAP).

20. Thermal bridging at junctions – availability of example detail sets.

Q. You note in the consultation the Scottish Accredited Construction Details will no longer be supported. I assume this means that ACD Psi-values should no longer be referenced when undertaking thermal bridging assessments for SAP?

A. No new detail set will be published to reflect improved U-values or different construction solutions. Published detail sets may still be cited where a detail is closely representative of the actual construction proposed and this is accepted by the verifier.

21. Thermal bridging at junctions – compliance with proposed details.

Q. Should greater checks on thermal bridging details on site be considered, perhaps through the Compliance Plan Approach?

A. We are proposing to develop additional guidance for 2022 on how to demonstrate effective management of the design and construction process for compliance with section 6. Such topics are likely to be discussed as part of that project.

22. Thermal bridging at junctions – simplification of process (range of junctions).

Q. Is there scope to reduce the number of thermal bridging junctions that have to be modelled as some provide greater heat loss than others?

A. This is not an issue being actively considered. Reference to assessment of thermal bridging will continue to follow the parameters set within the SAP and SBEM methodologies. However, we welcome any industry initiatives that support simpler and more practical assessment of heat loss performance at junctions.

Part 3 – Energy, all buildings

1. Limiting heat loss – alternatives to maximum elemental U-values.

Q. The domestic guidance clause 6.2.1 suggests the proposed 'alternative approach to limiting space heating demand' can be applied to extensions and conversions. Is this the case?

A. No, the proposed alternative approach to limiting space heating demand will only apply to new dwellings (where a SAP calculation is available). SAP can continue to be used for extensions as set out in standard 6.1 and clause 6.2.9 of the current published standards.

2. Limiting heat loss - alternatives to U-values for glazed elements

Q. We note that no reference is made to the use of Window Energy Ratings (WER) as an alternative specification for windows in existing buildings?

A. We recognise that WER is currently a referenced alternative in the retrofit market, cited in the current Technical Handbooks. We will engage with the glazing industry

to review guidance on this point, with a view to continuing citation as an option for existing buildings.

3. Limiting heat loss - Standardisation of U-values across different types of work

Q. We understand that, the same maximum area weighted U-values are being proposed for new buildings, new shell buildings (non-domestic) as well as new work to existing buildings (i.e. extensions, alterations and conversions), with these values differing only between domestic or non-domestic buildings. Is our understanding correct?

A. Yes, it is the same area weighted U-values that are cited for all work to existing buildings, shell buildings and new buildings. Different options of U-values are proposed depending on whether it is a domestic or non-domestic building.

Where the works proposed are a defined 'conversion', the maximum values should be applied to the extent this is 'reasonably practicable'. Please refer to 3.2.2 and 3.2.3 of the consultation document.

4. Introduction of the term 'Major Renovation'

Q. Is it proposed that the term 'major renovation' will be defined purely by the % of building envelope undergoing renovation, not being linked to renovation costs at all?

A. That is the question being asked in question 20 of the consultation. We welcome feedback, in understanding if the definition as proposed is considered fit for purpose. However, note there are further conditions that apply in determining whether electric vehicle charging infrastructure needs to be provided at the time of a major renovation. Refer to section 7, table 12 of the consultation for further information.

5. Works classed as 'renovation'

Q. What type of works will be classed as renovation of the surface of the building envelope?

A. Renovation is not itself a defined term and reference should be made to the dictionary definition – e.g. any construction work to which building regulations apply which is undertaken to improve, rather than simply restore, the external elements of a building. This may include work falling under Schedule 3 of the building regulations which does not require a building warrant but must still meet building regulations.

6. Domestic building services – minimum heat pump efficiency

Q. Minimum seasonal heating efficiency levels for domestic heat pump systems have improved except for domestic hot water heat pumps? What is the reason behind this decision; i.e. why is the minimum SCOP level for DHW heat pumps not being increased?

A. The values, developed at a UK level, reflect a reasonable minimum performance for the function for which the heat source is used. This includes the lower efficiency arising from a higher operating temperature where supplying DHW.

7. Non-domestic building services – removal of heating efficiency credits

Q. The EPC guidance currently allows for heating efficiency credits to be included for existing heating systems with improved control functions when generating EPCs for

existing non-domestic buildings, therefore improving the heating system efficiency and in turn potentially the EPC rating. With the proposal to remove this from the NDBSCG mean that these credits can no longer be assigned for EPC assessments?

- A.** Heating efficiency credits are removed for new or replacement of heat sources as these are no longer considered necessary or desirable – replacement heat sources are widely available at the minimum recommended standard. Any citation of ‘additional measures’ previously identified in this context will be considered under separate work on EPC reforms, noting that many such measures are already modelled and their benefit represented in the ND assessment.

8. Non-domestic building services – minimum control requirements

- Q.** Will there be changes to minimum heating system control requirements, except for the requirement of self-regulating devices, for all new heating generator installations in non-domestic buildings?

- A.** There is a new requirement for the provision of a Building Automation and Control System in new non-domestic buildings that have a heating system or systems for combined space heating and ventilation (with or without air conditioning) with an effective rated output over 290 kW. Other than this and the requirement for self-regulating devices there are no other changes proposed to heating system controls. Please refer to 3.2.11 of the consultation document.

9. Non-domestic building services – Building Automation and Control Systems

- Q.** It is proposed to call for Building Automation and Control Systems (BACS) in new non-domestic buildings that have a heating system or systems for combined space heating and ventilation (with or without air conditioning) with an effective rated output over 290 kW. Would a trigger relating to building size be more effective in delivering BACS to avoid systems being designed lower than the 290 kW threshold?

- A.** We are seeking views on this proposed threshold as part of the consultation – see question 30 in section 3 of the document.

10. Existing dwellings – use of EPC ratings to set minimum performance standards.

- Q.** As there are plans to ensure in the near future that house rentals and house sales will have to meet maximum allowable EPC ratings, shouldn't these maximum allowable EPC ratings be part of the building regulations as well?

- A.** That is a matter outwith the scope of this review. Please note that improvement of the existing stock is the subject of separate regulatory review, with intent set out in our recently confirmed [Heat in Buildings Strategy](#).

11. Existing buildings – requirements to improve via building regulations.

- Q.** Are there any changes to how the regulations will apply to refurbishment projects? As our existing building stock is a significant proportion of our building carbon emissions how are the new regulations going to tackle this to help realise our net zero targets?

- A.** Beyond the application of minimum standards to the extent of building work undertaken, that is a matter outwith the scope of this review.

Please note that improvement of the existing stock is the subject of separate regulatory review, with intent set out in our recently confirmed [Heat in Buildings Strategy](#). As regulations are made to drive the improvement of the existing stock, they will be cited in guidance to give context to action under building regulations.

Part 4 – Ventilation

1. Clause 3.14.5 Continuous mechanical extract ventilation – correction

Note: In the first line of paragraph 1, please note that “very low infiltration” should read “low infiltration”. Provisions specific to ‘very low infiltration’ buildings are covered in clause 3.14.6.

2. Non-domestic ventilation, section 4.1 – COVID 19

Q. We note that these updates focus on Overheating risk and the domestic standards. Are there any proposals to update the Non Domestic Standards in light of COVID-19 guidance relating to increased fresh air ventilation provision?

A. Yes, a fuller review of the ventilation standard is scheduled to start next year. This will consider provisions in non-domestic buildings and experiences from the pandemic and how these may affect industry standards. Research is also ongoing at present to assess the impact of the 2015 domestic ventilation standards and benefits from CO₂ monitors. More information will be provided near the end of 2021.

Q. Standard 3.14 refers to opening angles of windows in relation to the provision of purge ventilation. Is this angle determined when the window is fully open or in the restricted ventilation opening position (for example a child safety device)?

A. For windows that hinge or pivot, the opening angle is the angle between closed and maximum openable position after disengaging any opening restrictor device which can be manually over-ridden.

3. Non-domestic ventilation – current of future review

Q. Are there any changes proposed to standard 3.14 for non-domestic buildings?

A. No, a further comprehensive review of the ventilation standard will commence in 2022.

4. Domestic ventilation – provision for air transfer between rooms

Q. The ventilation guidance on air flow within the dwelling suggests providing a 10 mm gap between the bottom of the door and the threshold/floor finish would achieve adequate air movement between spaces. In the context of fire doors, some certification criteria limits the gap underneath fire doors to 3 mm. On that basis is a 10 mm gap a practical suggestion?

A. Yes. Clarification on this point in relation to certification of fire doors with regard to smoke performance will be provided.

5. Domestic ventilation – means of providing adequate purge ventilation (MVHR)

Q. Where MVHR systems incorporate summer bypass, will this be considered as an alternate approach to providing purge ventilation for the proposed overheating standard?

A. The proposed guidance to clause 3.14.3 confirms that purge ventilation may be provided by a mechanical extract system with a suitable high extract rate.

6. Domestic ventilation – centralised/decentralised mechanical extract

Q. The main consultation document makes reference to dMEV systems not being as effective as anticipated for dwellings with an airtightness from 3-5 but then later makes reference to continuous systems operated via a central fan or dMEV's. Can you clarify whether dMEV's can be used and if so is there additional information that would be required at warrant stage e.g. M&E sub-contractor design?

A. The consultation notes that current guidance for dMEV is not focussed on use as a 'whole dwelling' system and proposes "Revision of advice on dMEV systems to reflect only 'whole dwelling' use as opposed to current provisions which recognise ventilation of individual rooms". The consultation seeks feedback, through Q34, on the appropriateness of calling for decentralised MEV's to be presented on the same design parameters as a centralised MEV system. In other words, the system would be designed on the basis of a whole house solution that takes account of the location of extract terminals and the sizing of background ventilators.

Evidence of the whole house systems would have to be provided to the local authority verifier through the building warrant documentation and compliance demonstrated on commissioning of the completed system.

7. Domestic ventilation – review of benefit of CO₂ monitors

Q. Do you have any research on whether the CO₂ detector installed within Bedroom 1 has been a success, and is there any desire to role this out to other parts of the dwelling?

A. Research is being carried out to review the changes made to the domestic guidance in 3.14 Ventilation. One of the areas of research is the role that CO₂ monitors have played in improving indoor air quality and ventilation. This research is due to conclude by the end of summer/autumn 2022. Until the conclusions and any recommendations from the research is received, no changes are proposed.

8. Domestic ventilation – background ventilators provision

Q. To meet the increased trickle ventilation requirements through windows alone it isn't always ideal to have ventilation grills through the bedroom windows. Going forward is there any other suggested ways to meet these requirements (especially for smaller bedrooms with small windows)?

A. Proposals do not increase minimum trickle ventilation provision (for naturally ventilated dwellings).

Guidance within section 5 of the Domestic Ventilation Guide notes that the installation of trickle ventilators in window heads is often not the best location to encourage free movement of air and the designer should give consideration to installing two or more trickle ventilators at different heights in an apartment to assist

air movement. In addition, the guidance provides possible alternatives to proprietary trickle ventilators.

Part 5 – Overheating risk in new dwellings and other new residential buildings

1. SAP and Appendix P

Q. With a new overheating standard being proposed, what role will Appendix P of SAP perform?

A. As of 20.08.21, Appendix P of SAP has been removed from the most recent version of [SAP 10.2](#). Guidance to standard 6.6 will be amended to reflect this.

2. Simplified method, clause 3.28.3 – action sought

Q. If areas of glazing do not exceed the recommended 25% of room floor area, is any further action needed.

A. No further action is needed for 'Limiting solar gain through glazed openings'. Designers should still assess the building for 'Ventilation to assist in cooling' as this relates to the facility for cross-ventilation.

3. Simplified method, clause 3.28.3 – limiting solar gain

Note: Consultation document labels this clause 2.28.3 in error.

Q. Where glazed area exceeds the recommended 25% of the room floor area, if mitigation is proposed by amending the glazing g-value, what is expected?

A. The g-value would be altered to demonstrate that the total solar gain to the room did not exceed that from the limiting example, based upon 25% of floor area with g-value of 0.6. Example shown below:

% floor area	room area (m ²)	resultant glazing area (m ²)	solar energy arriving (W/m ²)	glazing g-value	solar energy transmitted (W/m ²)	Solar gain to room (W)
25	20	5	10	0.60	6.00	30
30	20	6	10	0.50	5.00	30
35	20	7	10	0.43	4.29	30
40	20	8	10	0.38	3.75	30
45	20	9	10	0.33	3.33	30
50	20	10	10	0.30	3.00	30

4. Extent of application of proposed overheating assessment

Q. Will the proposed overheating standard be applied to non-domestic residential buildings?

A. Q.41 of the consultation seeks views on whether the overheating standard should also apply to non-domestic residential buildings with a similar form and occupancy profile to dwellings.

5. Assessment - consideration of projected increase in temperature

Q. Is there any requirement to assess the overheating risk on future (2050) temp profiles?

A. The Design Methodology for the assessment of overheating risk in new homes (TM59) recommends using the Design Summer Year 1 which is intended to represent 2011 – 2040. TM59 advises that additional weather files are recommended to explore performance where there is a particular concern such as demonstrating mitigation options under more extreme weather events.

6. Assessment - Consideration of choice of heat emitters

Q. A significant amount of heat is retained in underfloor heating systems that may exacerbate the risk of overheating. Are there plans to consider the effects of underfloor heating through the overheating risk assessment?

A. Guidance on such matters would be useful, noting that this is principally an issue of awareness, both for designers and in the setting and review of heating patterns in a building. For example, in the zoning of controls and also in set-back of heating to allow for the beneficial effects of residual heat.

Part 6 – Improving and Demonstrating Compliance

1. Compliance Plan Approach - Compliance Plan Manager & Clerk of Works role

Q. Over recent years, the presence of an independent Clerk of Works has become less common. Would it be beneficial if all sites of a certain scale required a dedicated Clerk of Works who was responsible for managing the Compliance Plan process?

A. For high risk buildings (such as residential buildings over 11m, educational establishments, hospitals, local authority non-domestic public buildings - to be agreed through consultation in 2021) it is proposed that there should be a new Compliance Plan Manager appointed by, and acting on behalf of, the Relevant Person (normally the building owner). This role should be undertaken by a building professional to oversee the Compliance Plan and ensure it is fully discharged. The proposals for a Compliance Plan Manager role and the types of building to be defined as high risk buildings are considered within the [public consultation](#) which opened on the 11 November and closes on the 4 February 2022.

2. Compliance Plan Manager - appropriate professionals

Q. For the proposed Compliance Plan Approach, that is being considered through a separate public consultation, would a chartered architect be considered as an appropriate professional to act as Compliance Plan Manager?

A. That is a matter outwith the scope of this review. Please refer to the [Compliance Plan consultation](#).

3. The Compliance Plan Approach – EPC Assessors and Certifiers of Design

Q. Could EPC assessors or Certifiers of Design contribute to the Compliance Plan Approach providing evidence of compliance?

A. That is a matter outwith the scope of this review. Please refer to the [Compliance Plan consultation](#). It should be noted that the Compliance Plan is focussed on the duty of the applicant as discharged through those engaged to design and construct the building in accordance with building regulations. The use of certification of design and construction will be identified up-front as part of the development of the Compliance Plan and this may result in greater awareness and uptake of certification schemes for both design and construction.

4. The Compliance Plan Approach – higher risk buildings

Q. As part of the Compliance Plan Approach, will ‘higher risk’ buildings be defined to assist in determining the approach to implementing the compliance plan approach?

A. It is expected risk will be discussed in this context within the consultation. Please refer to the [Compliance Plan consultation](#).

6. The Compliance Plan Approach – relevance of other assurance regimes

Q. As an example, through NHBC, new houses are subject to inspections to determine compliance. Will this process of assurance be recognised within the compliance plan approach?

A. That is a matter outwith the scope of this review. Please refer to the [Compliance Plan consultation](#).

7. The Compliance Plan Approach – risk of divergent outcomes

Q. Will the Compliance Plan Approach be framed in a manner that could lead to different interpretations of the requirements?

A. No. The Compliance Plan Approach will seek evidence that the building, as designed and constructed, meets the specification of the buildings warrant, any amended warrant and the building regulations. We would expect proposals to assist in standardising approach rather than leading to differences.

8. The Compliance Plan Approach – other assurance frameworks

Q. Is there a role for PAS 2035 in the proposed Compliance Plan Approach?

A. Yes, the quality assurance information recorded as part of a retrofit project under PAS 2035, which is subject to a building warrant application, will likely contribute towards providing compliance evidence and assurance that the risk of non-compliance with the building regulations has been minimised.

9. The Compliance Plan Approach – conflict of interest

Q. Is there a potential conflict of interest if compliance plan managers are appointed/paid for or employed by developers and builders?

A. The Compliance Plan Manager (CPM) should be appointed by the Relevant Person (normally the building owner or developer) and be responsible to the Relevant Person (as the person legally responsible for compliance).

The CPM's role being to provide the Relevant Person with the necessary assurances that the risk of non-compliance has been minimised and that the Compliance Plan, as detailed and approved by the verifier at the outset, has been fully discharged. The completed Compliance Plan being necessary to support the competent submission of Completion Certificate to the verifier for consideration. Please refer to the [Compliance Plan consultation](#).

Part 7 – Electric Vehicle Charging Infrastructure

1. Proposals for EV charging - conflict against broader active travel objectives

Q. Are you not just perpetuating the reliance on cars with these plans? Why are you encouraging people to drive to work to charge a vehicle rather than do so at home and get them to use public transport and active travel?

A. There is a requirement to achieve a balance between public transport and active travel, and the use of electric vehicles. The plans are aligned to the Scottish Government's overall approach enabling a more sustainable travel and transport system.

Whilst we want transport to be aligned with the planning system - to remove reliance on cars for everyday journeys and car-based developments – we also have to be realistic, and that if people are going to use cars, we would prefer they are electric and, at the moment, the infrastructure is not there to support mass use of electric vehicles.

2. Kilowatt rating of charging installations – minimum rating

Q. Why are you mandating 7kW chargers?

A. We believe that setting the charger power output at a minimum of 7kW adequately allows for overnight charging. It is anticipated that the majority of people will use the charge points overnight and 7kW is sufficient for this. It serves a long dwell time and helps to manage the energy system.

Where a developer or business owner wishes to install a faster charge point, they can - we are just setting the minimum requirement. Developers may look to install faster charge points and utilise that as a selling point to potential buyers over their competitors.

3. Kilowatt rating of charging installations – minimum versus higher standards

Q. If the national minimum requirement for charge points will be 7kW, Local Authorities who wish to have a higher minimum requirement will be undermined, and some developers will not want to go higher than the national standard.

A. We do not want to undermine what Local Authorities are doing or prevent them setting their own standard. What we are proposing is a national minimum standard and Local Authorities will still have the authority to set a higher minimum standard for developments in their area.

By the time this legislation is in force, we do not believe that this will hamper Local Authorities ability to set a higher minimum standard or the viability of developments.

4. Car parking spaces for charging in context of overall parking provision

Q. Are the parking spaces for electric vehicles in addition to the standard spaces required in parking standards?

A. This isn't additional parking, this will be the installation of infrastructure to a proportion of the spaces which are planned or already there (in the case of existing non-residential buildings).

For example, if a new residential block of flats of 15 dwellings with 15 parking spaces is being planned, all those spaces will each have to have access to a its own charge point socket (minimum 7kW).

5. Car parking spaces for charging – accessible parking spaces

Q. Will the accessible parking spaces need to be assigned to blue badge holders only?

A. Our proposals are regarding the provision of charge points for any accessible parking spaces that developers provide for a number of building types, including new residential and non-residential buildings.

6. Application of provisions - car parks not related to a building

Q. What about car parks with no buildings, of which there are many in the our rural areas?

A. The regulations will not apply to car parks without buildings.

7. Charging specification - single or dual charger

Q. Is the requirement to fit single or dual chargers?

A. Whichever is the most suitable for the spaces for that building, the proposals are about ensuring access to a charge point socket.

8. Application of provisions – major renovation

Q. What is classed as major renovation of a building for non-residential buildings?

A. This is covered in section 3.2.1 of the consultation. At the moment there is no defined term. The definition will be in place by the time that the electric vehicle requirements become legislation.

9. Application of provisions – relationship with heat decarbonisation agenda

Q. Have you considered the impact of heat decarbonisation as part of your EV proposals for buildings?

A. Scottish Ministers have made it clear that we need to take action to address the climate emergency. That is not to say that we are not alert to the potential cost implications of introducing zero emission technologies in buildings including heat pumps as well as EV charge points.

But that is what this consultation is for - we want to further develop our understanding and would encourage stakeholders to provide feedback and evidence to our consultation to help us.

10. Application of provisions – lead in period for implementation

Q. What notice are you planning to give building developers?

A. Targeting introduction of legislation next year, therefore we plan to give developers 6 months' notice from the date any legislation is passed.

Annexes

Annex A – correction to Table A1 of Domestic Research paper

Original document published [here](#) - changes highlighted.

Table A1 – Amended cost data for fabric elements that vary between the selected specifications

Element	Specification	Unit	New cost (£ per unit)	Annual maintenance costs (£ per unit)*	Average life expectancy
External Wall – insulated plasterboard (30-60mm insulation), timber frame (120mm PIR insulation between studs), cavity and brick cladding	0.17 W/m ² .K	m ²	£187	£0	60
	0.15 W/m ² .K	m ²	£192	£0	60
	0.13 W/m ² .K	m ²	£196	£0	60
Ground / Exposed Floor (concrete slab, rigid insulation and screed)	0.15 W/m ² .K	m ²	£91	£0	60
	0.12 W/m ² .K	m ²	£100	£0	60
	0.10 W/m ² .K	m ²	£100	£0	60
Roof – mineral wool insulation between and above joists	0.11 W/m ² .K	m ²	£208 216	£0	60
	0.09 W/m ² .K	m ²	£216 208	£0	60
Windows uPVC	1.4 W/m ² .K	m ²	£285 395	£0	30
	1.2	m ²	£335	£0	30
	0.8	m ²	£395 285	£0	30
Doors composite	1.4 W/m ² .K	Nr	£700	£0	30
	1.2	Nr	£800	£0	30
	0.8	Nr	£950	£0	30
Gas boiler (incl flue, pump and controls)	System boiler	Nr	£2025-2340 700	£100	15
	Combi boiler	Nr	£2655 800	£100	15
ASHP	Standard (no cylinder)	Nr	£3,500	£75	15
	Higher efficiency (integrated cylinder)	Nr	£6,500	£75	15
Hot water cylinder	150l standard	Nr	£750	£0	20
	200l standard	Nr	£800	£0	20
	150l for heat pump	Nr	£880	£0	20

Element	Specification	Unit	New cost (£ per unit)	Annual maintenance costs (£ per unit)*	Average life expectancy
Waste-Water Heat Recovery	Vertical pipe system (houses and upper floor flats)	Nr	£450 400	£0	60
	Tray system (ground floor flats)	Nr	£1200	£0	20
Radiators (excluding heating pipework and valves)	Standard	Nr	£60	£0	20
	Sized for lower temperature heating	Nr	£90	£0	20
Extract fans	2 in small flats, 3 in large flats, 4 in semi /mid terraced and detached homes	Nr	£300 450 -600	£0	20
MVHR unit	No ductwork	Nr	£1400	£30	20
MVHR ducting	Rigid ductwork	m ² GIFA	£15-20	£0	60
Roof mounted - photovoltaic panels	Fixed costs for systems <4kWp	Per installation	£1,100	£48	25
	Variable costs for systems <4kWp	Per kWp installed	£800	Incl in fixed	25
	Variable costs for systems >4kWp	Per kWp installed	£1,100	£12	25