Consultation Response

Tuesday 13th April 2021

The Future Buildings Standard

Consultation on changes to Part L (conservation of fuel and power) and Part F (ventilation) of the Building Regulations for non-domestic buildings and dwellings; and overheating in new residential buildings

The Energy and Utilities Alliance (EUA) provides a leading industry voice helping shape the future policy direction within the sector. Using its wealth of expertise and over 100 years of experience, it acts to further the best interests of its members and the wider community in working towards a sustainable, energy secure and efficient future. EUA has seven organisational divisions - Utility Networks, the Heating and Hotwater Industry Council (HHIC), the Industrial & Commercial Energy Association (ICOM), the Manufacturers of Equipment for Heat Networks Association, the Hot Water Association (HWA), the Manufacturers' Association of Radiators and Convectors (MARC) and the Gas Vehicles Network (GVN).

EUA represents all the main heating manufacturers in the UK along with the majority of major installation companies, training providers and component manufacturers. Approximately 98% of heating measures installed in UK homes comes from an EUA member.

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111. Do you agree that we have adequately covered matters which are currently in the Domestic Building Services Compliance Guide in draft Approved Document L, volume 1: dwellings for existing homes?

No. There are two main areas where EUA do not believe the draft ADL text is adequate. This as it does not reflect where initial "guidance" has subsequently evolved the state of the art, and so failing to transpose what are now minimum industry requirements, risks a regression of standards.

For the proposed removal of text relating to treating the feed water to combi boilers and water heaters, in hard water areas, one such area of concern, please see our dedicated response to question 118, where we provide more detail on this.

Within the 2013 DBSCG, the following supplementary information was included: "A filter can also be fitted to the central heating circuit to help maintain the efficiency and reliability of the system." With the 2019 update to BS 7593, the standard now explicitly states that an inline filter should be installed to the heating system. As such this should also be drawn out in the proposed ADL text, to recognise its equal importance alongside system cleansing, flushing, and the use of a suitable chemical inhibitor, as the recognised means to maintaining system efficiency and reliability, and so to achieving regulatory compliance.

<u>Proposed rewording of Section 8.6:</u>

"Before a new heating appliance is installed, all central heating and primary hot water circuits should be thoroughly cleaned and flushed out and an inline filter installed. A suitable inhibitor

should be added to the primary heating circuit to protect against scale and corrosion. Domestic central heating systems should be prepared and commissioned to BS 7593:2019.

112. Do you agree with the proposed minimum standards for building services in existing homes, as detailed in Sections 5 and 6 of draft Approved Document L, volume 1: dwellings?

Yes.

113. Do you agree with the proposals for replacement fixed building services in existing homes, as detailed in Section 5 of draft Approved Document L, volume 1: dwellings?

Yes. In 5.10 (page 47) of the consultation draft Approved Document L (dwellings); Controls and zoning, there is the following statement: "For wet heating systems in new dwellings with a floor area of 150m2 or greater, a minimum of two independently controlled heating circuits should be provided."

We note that this is framed as for "new dwellings", whereas the Domestic Building Services Guide currently frames this requirement as for "new gas fired wet central heating systems" seemingly regardless of whether the "new" system is being installed in new or existing dwellings. When the entire heating system is replaced, then it would be prudent to require zoning of the heating system where total floor area exceeds 150m2, even for existing dwellings, as this promotes a more efficient heating solution for larger properties…"

Minimum standards for existing buildings should include, under domestic hot water, a section to check the suitability of the property for wastewater heat recovery and, where appropriate, the technology should be installed. If a new hot water system is being installed, especially if it includes a cylinder, the benefits are significant and include:

- Reduction in overall domestic hot water demand by 20-40% depending on the product and installation method.
- Could result in smaller space being required for cylinder.
- Less recovery time needed between long domestic hot water draw offs (e.g. showers).
- Futureproof the home for future transition to low carbon heating

An average new hot water cylinder will have a daily heat loss of approximately 2 kWh per day, but for 8 months of the year this heat loss actually contributes to the heating load in the home so only 245 kWh is really lost over the year. Compare this to a family home who may lose over 4 kWh per day through the drain from showering and this is every day, which is approx. 1500 kWh per year, so six times as much as we actually loose from the cylinder. Therefore, possibly waste water heat recovery should be considered in homes with three or more bedrooms or where the extension will create a total of 3+ bedrooms for the dwelling.

114. Do you agree with our proposed approach to mandating self-regulating controls in existing domestic buildings, including technical and economic feasibility, as detailed in Sections 5 and 6 of draft Approved Document L, volume 1: dwellings?

Yes.

115. Do you agree with the proposed specifications for building automation and control systems installed in a new or existing home, as detailed in Section 6 of draft Approved Document L, volume 1: dwellings?

Yes.

116. Do you agree with the proposals for extending commissioning requirements to Building Automation and Control Systems and on-site electricity generation systems, as detailed in Sections 8 and 9 of draft Approved Document L, volume 1: dwellings?

Yes.

117. Do you agree with the proposals for requirements relating to the assessment of overall energy performance of building services installations and providing information to homeowners, as detailed in Sections 8 and 9 of draft Approved Document L, volume 1: dwellings?

Yes, but the format of the homeowner's guide will need to echo and supplement, not detract from, the importance of the equipment manufacturers instructions on usage.

We agree and support the approach taken to assessing "technical building systems", including enabling documentation and processes already in place to fulfil many of the requirements, e.g. manufacturers technical fiche (ErP) and the HHIC Benchmark commissioning documentation (e.g. for boilers and heat pumps).

What we would raise is that for this assessment to be more meaningful, data should be captured and documented in a way that the installed building services efficiency, and performance of the dwelling, is available for future reference, in a digital form.

The HHIC Benchmark scheme has recently gone live as a digital medium, and we would encourage MHCLG to engage with us on this particular topic/question, as we see great potential for the digital scheme to act as a vehicle for the ongoing improvement and maintenance of installed UK heating systems.

118. Do you agree with the proposed changes to water treatment guidance and removing formal guidance on water softening?

No. EUA agree with the proposed changes to water treatment guidance (noting consultation update clarification note) but do please cross-refer to our answer to question 111, where we feel that the need for an inline filter should be explicitly referenced also.

For the second aspect of the question, the text on treating the feedwater to combis and water heaters, when hardness exceeds 200 ppm, then this must absolutely remain a requirement within Part L. We would highlight that the correct language and terminology needs to be used, i.e. that treating the feed water is the key, to control the production of limescale in hard water areas. Whole house "water softeners" can provide this, but equally so can dedicated limescale reduction devices, e.g. those installed on the cold mains inlet to combi boilers.

EUA challenge the assumption that the requirement to treat the feed water does not relate directly to Part L scope, as it *directly* impacts on the overarching objective for the conservation of fuel and power. It is proven and well documented that even very fine levels of scale adversely affect the energy needed to heat water. Even at a thickness of 0.1mm, this requires a 5% increase in energy. At 1mm thickness the energy increase is 40%(1) (note that the increase is linear).

(1) https://www.awt.org/resources/seed-program/water-careers/science-of-scaling

Increasingly, MHCLG's stated assumption also appears to be contradicted by Government's own advisers*, and commissioned work**:

*Committee on Climate Change, 6th Carbon Budget; Buildings; page 10 - https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Buildings.pdf

*"..**Water softening**: **Build-up of limescale in a home's central heating system due to hard water can reduce the efficiency of heating systems**. We therefore include measures for water softening in our scenarios…"*

**See also page 62-63 - BEIS Heat Distribution Systems Evidence Gathering - Final Report_Draft_ISSUED (publishing.service.gov.uk)

This is another example where the existing compliance guide text has driven installer behaviours which have led to high standards of consumer protection, and the conservation of fuel and power, through safeguarding against limescale production. In particular for the combi boiler market, which is currently circa 1.2m new units pa, EUA fear that removing this text will lead to a regression in installation practices and standards, increased appliance breakdowns due to scale formation, and so negative consequences and increased costs for both consumers and industry alike.

119. Do you agree with the guidance proposals for adequate sizing and controls of building services systems in domestic buildings, as detailed in Sections 5 and 6 of draft Approved Document L, volume 1: dwellings?

No, the guidance should be improved. The guidance given in 5.7 and 5.9 appears to be based on historical fixed output appliances, and does not reflect modern heating technology, or modern consumer expectations. Today's modulating appliances will intelligently match their output to varying heating and hot water loads.

Where space heating (5.7) is considered then this is complemented by the existing heating controls requirements of Part L (e.g. Boiler Plus), where compensating controls further optimise heating appliance output to varying loads arising from internal and/or external temperature changes.

For hot water storage (5.9), then typically the required heat output of the heat generator is much larger than for space heating, to ensure fast cylinder recovery times, and so meet consumer comfort and performance requirements.

The current text in 5.7 and/or 5.9 could lead the heat generator to erroneously be deemed "oversized" for either the space heating requirement, hot water, or both. Strict text on oversizing may also be at odds with low-carbon, future-proofing measures to be adopted for the hot

water system, such as renewables compatibility, demand side response and/or load-shifting capability (multiple heat sources).

Lastly, we do not feel that MHCLG should reference specific industry guides in this area, even as examples, but be more generic.
We would propose the text for sections 5.7 and 5.9, as per below:

5.7:

The specification of space heating systems should be based on an appropriate heat loss calculation for the building, based on the manufacturer's instructions, and a suitable sizing methodology that takes account of the properties of the dwelling~~., such as The Energy Saving Trust's CE54 Domestic Heating Sizing Method or the Chartered Institute of Plumbing and Heating Engineering's Plumbing Engineering Services Design Guide~~. Depending on system type/protocol, s~~S~~ystems should not be significantly oversized. ~~In most circumstances this means that the heating appliance should not be sized for more than 120 per cent of the design heating load.~~

5.9:

Domestic hot water systems should be sized for the anticipated domestic hot water demand of the building, based on BS EN 12831-3 or suitable industry guidance.~~the Chartered Institute of Plumbing and Heating Engineering's Plumbing Engineering Services Design Guide~~. Depending on system type/protocol, s~~S~~ystems should not be significantly oversized. NOTE: For temperature limits to control legionella bacteria in domestic hot water systems, see Approved Document G (sanitation, hot water safety and water efficiency).

120. Do you agree with the guidance proposals on sizing a system to run at 55°C when a whole heating system is replaced, as detailed in Section 5 of draft Approved Document L, volume 1: dwellings?

No. EUA believes that this should be a maximum Mean Water Temperature (MWT) of 50 degrees. Asking the system to run at 55 degrees could actually lead to poorer outcomes for consumers.

A MWT would be a more technology agnostic approach as both heat pumps and boilers run at an optimal level at at MWT of 50. For example, the optimal flow and return temperatures for a boiler are 60/40 and for a heat pump 55/45. Both these have a MWT of 50. Boilers have an optimal dew point at 55 degrees which a max temperature of 55 would probably not achieve but a MWT of 50 would. For heat pumps, the optimal running setting should not be above 55 degrees due to the drop off in COP.

121. Do you agree with the proposed changes to the supplementary guidance and the external references in Appendix D and Appendix E, in the draft Approved Document L, volume 1: dwellings as outlined in paragraph 6.8.2.?

Yes, but not with the changes to the supplementary guidance. Please see our answers to questions 111 and 118, as regards to why we disagree currently with the removal of previous "supplementary information".