

Response ID ANON-N96P-VREB-V

Submitted to Scottish Building Regulations: Proposed changes to Energy Standards and associated topics, including Ventilation, Overheating and Electric Vehicle Charging Infrastructure
Submitted on 2021-11-25 12:52:07

Section 1 - Energy - New Buildings - Questions 1 - 11

1 Do you support the extension of standard 6.1 to introduce an energy target in addition to the current emissions target? If yes, do you have a view on the metric applied - primary or delivered energy?

Yes, a primary energy target

Please provide a summary of the reason for your view below::

EUA has no overriding preference, however if required then a primary energy target would probably lead to more focus on fabric first and therefore reduced energy demand.

2 What level of uplift to the 2015 standard for new dwellings do you consider should be introduced as an outcome of this review?

Option 1: 'Improved' standard (32% emissions reduction)

Please provide a summary of the reason for your view below::

A 32% reduction is a good interim step ahead of tighter restrictions that will come later in the decade. This will allow manufacturers, installers and the wider supply chain to upskill and grow to be able to achieve greater emission reductions in the future. 32% will still be challenging and will require new learning and new installation skills. It should not be viewed as an easy or unambitious target.

3 What level of uplift to the 2015 standard for new non-domestic buildings do you consider should be introduced as an outcome of this review?

Option 1: 'Medium' standard (16% emissions reduction)

Please provide a summary of the reason for your view below::

A 16% reduction is a good interim step ahead of tighter restrictions that will come later in the decade. This will allow manufacturers, installers and the wider supply chain to upskill to be able to achieve greater emission reductions in the future. 16% will still be challenging and will require new learning and new installation skills. It should be viewed as an easy or unambitious target.

4 Do you have any comments or concerns on the values identified for the elements which make up the domestic notional building specification for either option, e.g. in terms of their viability/level of challenge?

Yes

If yes, please provide your comments below::

A specified WWHR efficiency of 55% (proposed for gas notional dwelling) may not be appropriate for flats, where components may need to be housed in flats below (vertical units). Developers would be reluctant to do this, and so 35-40% for horizontal systems may be more appropriate in these cases (see also recent Welsh Govt. Response to stage 1 consultation, where several respondents highlighted this concern)

5 Do you have any comments or concerns on the values identified for the elements which make up the non-domestic notional building specification for either option, e.g. in terms of their viability/level of challenge?

Yes

If yes, please provide your comments below::

6 Do you have any comments on the simplified two-specification approach to defining the domestic notional building from 2022?

No

If yes, please provide your comments below::

7 Do you have any comments on the simplified two-specification approach to defining the non-domestic notional building from 2022?

No

If yes, please provide your comments below::

8 Do you have any comments on the proposal to separate and provide a more demand-based approach to assignment of domestic hot water heating within the non-domestic notional building specification from 2022?

Yes

If yes, please provide your comments below::

The DHW demand should not be based on a volume of water per m² of a building. This is because buildings have different requirements and come in different area sizes. For example, a Laundrette would normally occupy a relatively small floor area but the water volume is vast. The same can be applied to many hospitality venues. These can have large floor area, but the demand would be less than a high demand building. Also, this kind of building type would still need high volume hot water due to the dish washing and food prep but could also utilize Point of Use hot water in areas such as toilets.

Calculation methods for heating and hot water demand should be used to select the relevant technology.

9 Do you support the change in application of targets for supplied heat connections to new buildings, focussed on delivering a consistent high level of energy performance at a building level?

Yes

Please provide a summary of the reason for your view below::

EUA agrees with the proposed changes. However, we are concerned that the approach to HIU heat losses intimated in 6.1.6 is a divergence from the approach being taken in England and Wales. Here, HIU heat losses will be taken from the BESA test regime with losses published in the Product Characteristic Database (PCDB) by the manufacturer. The method mentioned in 6.1.6 looks to hint at a different approach where useful heat losses are taken into account. EUA would urge that uses of heat losses are consistent across the UK for ease of comparison and consistency.

10 Do you agree with the principle set out, that the benefit from on-site generation within the compliance calculation should be limited by a practical assessment of the extent that generated energy can be used on-site?

Yes

Please provide a summary of the reason for your view below::

11 Are there any particular concerns you have over this approach, e.g. with regards particular technologies or solutions?

No

If yes, please provide your comments below::

HHIC would not support the omission of "zero direct emissions" (still to be fully defined?) buildings from an emissions target, in principle, and as this fails to recognise upstream carbon (e.g. marginal generation from coal/gas), despite SAP carbon-emission-factors applying to all fuels used in dwellings

Section 1 - Energy - New Buildings - Questions 12 - 23

12 Do you agree with the proposal that new buildings where heat demand is met only by 'zero direct emissions' sources should be exempt from the need for a calculation to demonstrate compliance with the Target Emissions Rate?

Yes

Please provide a summary of the reason for your view below::

EUA agrees. However the information given to the householder needs to be technology agnostic to allow for all future energy vectors to be considered, such as hydrogen.

13 Do you support the need for new buildings to be designed to enable simple future adaptation to use of a zero direct emissions heat source where one is not installed on construction. And for information setting out the work necessary for such change to be provided to the building owner?

Yes

Please provide a summary of the reason for your view below::

The fabric of the building should be addressed first. This will bring down the overall heat demand. This will then allow for a more appropriately sized technology to be installed. It will also ensure that the right type of technology will be installed.

14 Do you have any comments on the level of information needed to support such action in practice and on the extent to which alterations other than at, or very close to, the heat generator can be justified?

Not Answered

If yes, please provide your comments below::

15 Do you support the retention of the current elemental approach to setting minimum standards for fabric performance in new dwellings, supported by the option to take an alternate approach via calculation of the total space heating demand for the dwelling (as described)?

Not Answered

Please provide a summary of the reason for your view below::

16 In the context of the proposed approach, do you have any comments on the maximum U-values proposed for elements of fabric, in relation to their level of challenge and achievability at a national level?

Not Answered

If yes, please provide your comments below::

17 Do you support the move to airtightness testing of all new dwellings, by registered members of an appropriate testing organisation?

Not Answered

Please provide a summary of the reason for your view below::

18 Do you support the move to increased airtightness testing of all new non-domestic buildings, by registered members of an appropriate testing organisation?

Not Answered

Please provide a summary of the reason for your view below::

19 Do you support the adoption of CIBSE TM23 as the basis for airtightness testing in Scotland?

Not Answered

Please provide a summary of the reason for your view below::

20 Do you support the introduction of the pulse test method of airtightness testing as a further means to testing and reporting on the performance of new buildings?

Yes

Please provide a summary of the reason for your view below::

EUA agrees. However, a more robust and descriptive set of conditions that define a 'major renovation' should be outlined.

21 Are there any particular benefits, risks or limitations you would seek to identify?

Yes

If yes, please provide your comments below::

22 Do you consider the amended provision provides an appropriate balance between: the requirement to improve building energy performance in new buildings; enabling the reuse of better performing modular elements; and enabling use of small units for short term use at short notice?

Yes

Please provide a summary of the reason for your view below::

We would also welcome your views on the proposed simplification achieved by setting of a single set of values for all building work to new and existing buildings.

23 We welcome any other comments you may wish to make on the proposed changes to the setting of performance targets for new buildings or the application of other amended provisions within Section 6 (energy) of the Technical Handbooks which apply to the delivery of new buildings.

Please provide your comments below::

If you wish to provide additional information to support your comments regarding the proposals for new buildings please upload relevant file below::

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Section 2 - Energy - All Buildings - Questions 1 - 9

1 The term 'major renovation' means the renovation of a building where more than 25% of the surface of the building envelope undergoes renovation. Do you agree with the proposed introduction of this term as an additional means of identifying when aspects of building regulations shall be applied to an existing building?

Not Answered

Please provide a summary of the reason for your view below::

2 Do you support the proposed improvement in maximum U-values for elements of building fabric for domestic buildings?

Not Answered

Please provide a summary of the reason for your view below::

3 We would also welcome your views on the proposed simplification achieved by the setting of a single set of values for all building work to new and existing domestic buildings.

Please provide your comments below::

4 Do you support the proposed improvement in maximum U-values for elements of building fabric for non-domestic buildings?

Not Answered

Please provide a summary of the reason for your view below::

5 We would also welcome your views on the proposed simplification achieved by setting a single set of values for all building work to new and existing non-domestic buildings.

Please provide your comments below::

6 Do you support the proposed standardisation of values and approach for conversions, extensions and shell buildings?

Not Answered

Please provide a summary of the reason for your view below::

7 If you have a view on the preferred format for presentation of information on compliance of building services, what would be your preference?

Move Compliance Guides into Section 6 as an Annex

Please provide a summary of the reason for your view below::

This would simplify via removal of an additional tier of guidance, but maintain the content and correctly position the compliance guides as intrinsically linked to the fulfilment of the requirements set out in the handbook. The handbook itself being statutory guidance.

8 Do you support the continued alignment of minimum provisions for fixed building services at a UK level within the Domestic Building Services Compliance Guide?

Yes

Please provide a summary of the reason for your view below::

Many of our members operate across the UK. Alignment of minimum standards facilitates market access, simplifies compliance, and lends itself to supply chain development. Therefore we would urge the Scottish Government to ensure a consistent level of alignment.

9 Are there any issues you wish to raise in relation to the amended specifications set out in the draft Guide?

Yes

If yes, please provide your comments below::

Section 1.9 of the consultation draft Domestic Building Services Compliance Guide (hereafter "DBSCG") talks of a maximum mean water temperature (MWT) of 55C. HHIC/EUA advocate MWT as a more appropriate metric for low temperature systems, but we believe this to be an error, and the figure should be 50C. This aligns with our previous feedback about technology agnosticism, and enabling both heat pumps and boilers to perform optimally.

- Section 1.10 – There is no mention of the Benchmark commissioning scheme, widely adopted and employed by the heating industry. The scheme and its supporting documentation, provided with the appliance(s) to be installed, has for many years been referenced in the DBSCG (at least document for England & Wales), which has ensured installer awareness and aided compliance. The scheme encompasses a range of heating technologies (e.g. boilers/heat-pumps), and is now digital for boiler installations, with the digitalisation of other technologies set to follow. Benchmark is also intrinsically linked to appliance warranty provision, so aids consumer protection. We would suggest text amendments here, as the CIBSE/BSRIA are not in isolation sufficient, e.g. "manufacturers' instructions" are also key to correct and successful commissioning, and Benchmark supports the overarching requirements of 6.7.2. & 6.7.3. in Section 6 (commissioning outputs and documents). Please mirror the text from the last seen draft Approved Document L for England (Future Buildings consultation draft):
"..System specific guidance for commissioning
Hot water systems for space and domestic hot water heating

8.6 Before a new heating appliance is installed, all central heating and primary hot water circuits should be thoroughly cleaned and flushed out. A suitable chemical 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.

NOTE: The Benchmark commissioning checklist can be used to show that commissioning has been carried out satisfactorily for the heating and hot water system and its heat generation source...."

- Table 2 of the draft DBSCG makes a necessary reference to BS 7593:2019. This is valid in the "commissioning" section, as stands, is equally, if not more applicable, to the "system preparation and water treatment" section of the table. Please reproduce in this section as these matters are the focus of BS 7593:2019.

- In table 2, the guidance for "Boiler replacement (planned/emergency)" is ambiguous, when considering the planned implementation of Boiler Plus standards. It currently makes no reference to combi boilers, which is where the "additional measure" requirement applies, so we would suggest the highlighted text as an addition:

"...in addition to the above, at least one of the following energy efficiency measures should be installed where a combi boiler is specified. The measure(s) chosen should be appropriate to the system in which it is installed, and not affect the safe operation of the replacement appliance. • Flue gas heat recovery • Weather compensation • Load compensation • Smart thermostat with automation and optimisation..."

- Table 4 guidance on planned radiator replacement is also ambiguous. It can be read that if only a single radiator is replaced, all others in the dwelling require self-regulating-devices (SRD's) to be installed?.....is this the intent of BSD?....The underpinning new section 15.3 talks only of new buildings and the replacement of heat generators (in existing) as effecting the SRD requirement. The existing text, and so this point, is mirrored for table 4, covering oil fired heating systems

- The "...additional recommendations..." footnote at the bottom of table 10 "system preparation and water treatment", contains an incorrect reference to BS 7593:2006 (now superseded by BS 7593:2019, as correctly referenced elsewhere in the draft DBSCG). HHIC would suggest removing this footnote, as some aspects referred to have changed with the BS 7593:2019 update, so to avoid confusion and conflicting guidance. The key high level requirements and information will be retained in the table(s).

- Table 15 "Heat pumps" (hydronic) – the "installation & commissioning" section does not reference Benchmark or BS 7593:2019. As previously stated, Benchmark encompasses these heating technologies, and should be referenced, again as per the consultation draft text from the Approved Document L for England. BS 7593:2019 should also be referenced in this section, as the appropriate standard for closed circuit hydronic heating systems for dwellings. BS 7593:2019 should also be added to the list of relevant standards in section 4.4. of the DBSCG.

- Whist not our primary focus as a trade association, there may be elements of the points made previously, applicable to Table 17 (electric boilers), and potentially solid-fuel-fired heating systems

Section 2 - Energy - All Buildings - Questions 10 - 17

10 Do you support the continued alignment of minimum provisions for fixed building services at a UK level within the Non-domestic Building Services Compliance Guide?

No

Please provide a summary of the reason for your view below::

For existing buildings where a dual fuel boiler is needed (hospital), the choice is limited if the efficiency is set to the same level of new building. Also, attention should be drawn to direct fired water heaters. Due to the nature and usage of these types of appliances, they are difficult to replace with alternative fixed building services due to space, performance and installation issues.

The proposal is to increase of efficiencies for both new build and existing buildings for the category of direct-fired water heaters. This level of uplift would be difficult for manufacturers to effectively prepare for within the timeframes set and could lead to a product hiatus in the market. This product gap would lead to technical and economic feasibility issues, whilst enabling the potential deployment of higher carbon and not fit-for-purpose technology. In general, we support the goal to increase the market penetration of more-efficient hot water heaters in non-residential buildings, thereby contributing to overall reductions in greenhouse gas emissions (GHGs) in the built environment. With this goal in mind, the proposal for expanding the current seasonal efficiencies of hot water heaters in new non-domestic buildings to existing non-domestic buildings is too ambitious and will cause unintended consequences for manufacturers, buildings owners, and policymakers.

The adoption of the minimum seasonal efficiencies reflecting the use of condensing technology for non-domestic buildings with such a short compliance period will cause significant impacts to existing building owners.

More specifically, many of the building owners and operators of non-domestic buildings plan and save over a multi-year period well in advance of water heating system upgrades due to the costs associated with the equipment and associated installation. We are concerned that many building owners will forgo much needed replacements and extend the life of their existing equipment due to the small compliance window coupled with the increased costs of installing condensing equipment. Many of these non-domestic building owners will not be able to afford the increased costs associated with condensing products and installation in the near term forcing them to extend the life of their 10 to 15 year water heating system.

This significant cost cannot be overlooked and building owners must be given the time necessary to prepare for another transition. Consequently, we respectfully request that the compliance date being considered for the increased seasonal efficiency for replacement water heaters should coincide with the introduction of the 2025 Future Building Standards January 1, 2026. Extending the time for compliance would allow building owners to plan accordingly for the increases in costs associated with condensing equipment and installation, while allowing the savings from low-NOx water heaters to continue to be locked in over the next 5 years. This is the best outcome to help reach the policy goals of reducing emissions, while allowing both industry and its customers a managed transition to more efficient water heating equipment.

Our proposal is to maintain the current levels as detailed below for direct fired water heaters (minimum base efficiencies) until full implementation of the Future Building Standard in 2026.

DHW system Type Fuel Type Heat Generator seasonal efficiency Product Standard

- Direct-fired: New buildings

- o Natural gas > 30 kW output 90%

- o Natural gas ≤ 30 kW output 73%

- o LPG > 30 kW output 92%

- o LPG ≤ 30 kW output 74%

o Oil 76%

• Direct-fired: Existing buildings

o Natural gas 73%

o LPG 74%

o Oil 75%

• Indirect-fired: New and existing buildings

o Natural gas 80%

o LPG 81%

o Oil 82%

The proposal above will ensure that the best available technology is implemented during this uplift period ready for greater efficiencies and different energy vectors in the future

11 Are there any issues you wish to raise in relation to the amended specifications set out within the draft Guide?

Not Answered

If yes, please provide your comments below::

12 Do you agree with the proposal that the option of installing a less efficient heat generator and compensating for this using heating efficiency credits in existing buildings should be withdrawn from the Non-domestic Buildings Services Compliance Guidance?

No

Please provide a summary of the reason for your view below::

The use of heating efficiency credits encourages a more holistic approach to boiler replacements. The overall efficiency of the system is more important than the efficiency of only the boiler.

There have been significant improvements across the efficiencies of boiler and water heating technologies but there are technological and economic considerations from a consumer perspective that need to be addressed.

It is our belief that the use of heating efficiency credits also has the added benefit of imparting best practice, irrespective of heat generator efficiency the use of heating credits can benefit the overall efficiency of the system. Decentralising and appropriately sizing are key criteria in energy usage for hot water delivery and therefore should be maintained in the wider context of energy usage.

Other considerations that can have significant benefits are highlighted below with evidence.

1. Turndown Ratio of an appliance. Gas appliances have been developed to have increasing ranges of modulation, which means they can react more accurately to the demands of the system by adjusting their burner. This technology has been overlooked but it can contribute to reducing CO2 volumes by simply having greater control over a system whether that be heating and hot water.

For example: Using a DHW system on a secondary return, if that system has a heat loss of around 6kW/h then a modulating water heater would be able to reduce its input relevant to the demand.

If the technology deployed does not have the expansive range of modulation that are available within today's direct fired water heaters, then there would be the following outcome.

1. The temperature of the water would need to drop to a level where the water heater could come on or the flow rate of the system would need to increase to allow for the higher input requirement. This scenario would increase the CO2 contribution as it would mean that more energy would be used compared to a water heater that can modulate down expansively to maintain a small kW demand.

See below for an example of two Gas Appliances with the same efficiency but different modulation range.

Appliance.1. - 96% Gross Efficiency, 60kW Input, modulation range of 13:1. Min heat input is 4.6kW

Appliance.2. - 96% Gross Efficiency, 60kW input, modulation range of 6:1. Min heat input is 10kW

We therefore recommend that the heating efficiency credits are kept in place and extended to include modulation and best practice whilst supporting greater system efficiency.

Decentralization - The benefits of decentralized hot water are well documented and support the need to size water heating equipment appropriately. In existing buildings, centralised heating and hot water systems have traditionally adopted the thermal storage design. These systems are frequently over-sized at the design stage creating safety margins in design. Ultimately resulting in higher energy usage and losses from the need to store and pump hot water around a buildings for anti-legionella good practice.

Findings in an independent report by AECOM calculated that direct fired water heaters are 7.5% more economical when used in a decentralised arrangement.

The heating efficiency credits are also an opportunity to recognise the impact of water heaters and boilers that are developing at speed to incorporate hydrogen fuel for combustion. The blending of hydrogen with methane is being discussed as starting in 2023 in the northwest of England with other regions to follow.

The blending of hydrogen presents large scale potential for decarbonisation. Using the calculation below we can establish that a 20% hydrogen blend with methane will deliver a near 8% reduction in carbon emissions.

Summary

We propose that the heating efficiency credits, remain and are extended to support the development of best practice and recognition of future energy vectors that will impact the heating and hot water market from now until 2025 and beyond.

13 Do you agree with the proposal to limit distribution temperatures in wet central heating systems to support effective implementation of low and zero carbon heat solutions and optimise the efficiency of heat generation and use?

Yes

Please provide a summary of the reason for your view below::

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.

14 Do you agree with the proposed extension to the provision of self-regulating devices to include when replacing a heat generator?

Yes

Please provide a summary of the reason for your view below::

15 Do you have any comment on issues of technical feasibility or determining when installation should be at a room/zone level?

Not Answered

If yes, please provide your comments below::

16 Do you agree with the proposed introduction of a requirement for building automation control systems, of the type specified, in larger non-domestic buildings with systems with an effective rated output over 290kW?

Yes

Please provide a summary of the reason for your view below::

17 We welcome any other comments you may wish to make on these topics and broader changes to the setting of minimum standards for all buildings.

Please provide your comments below::

If you wish to provide additional information to support your comments regarding the proposals for all buildings please upload relevant file below::

No file uploaded

About you

What is your name?

Name:

Isaac Occhipinti

What is your email address?

Email:

isaac@eua.org.uk

Are you responding as an individual or on behalf of an organisation?

Organisation

What is your organisation?

Organisation name:

EUA

If responding on behalf of an organisation please select the most relevant type of organisation from the list below:

Industry Association/Manufacturer

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The Scottish Government would like your permission to publish your consultation response. Please indicate your publishing preference:

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Yes

I confirm that I have read the privacy policy and consent to the data I provide being used as set out in the policy.

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Evaluation

Please help us improve our consultations by answering the questions below. (Responses to the evaluation will not be published.)

Matrix 1 - How satisfied were you with this consultation?:

Slightly satisfied

Please enter comments here.:

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