RIBA

Royal Institute of British Architects response to the Ministry of Housing, Communities & Local Government: The Future Homes Standard 2019 Consultation on changes to Part L (conservation of fuel and power) and Part F (ventilation) of the Building Regulations for new dwellings

The Royal Institute of British Architects (RIBA) is a global professional membership body that serves its members and society in order to deliver better buildings and places, stronger communities and a sustainable environment. We provide the standards, training, support and recognition that put our members – in the UK and overseas – at the peak of their profession. With government and our partners, we work to improve the design quality of public buildings, new homes and new communities.

The RIBA welcomes the opportunity to respond to this consultation on the regulations governing the energy performance of new residential buildings.

On 29 June 2019 RIBA Council voted to join the global declaration of an environment and climate emergency, two days after the UK government passed a law to require the UK to end its contribution to global warming by 2050 by bringing all greenhouse gas emissions to net zero.

The climate emergency demands urgent action and leadership by architects and the wider construction industry. We welcome the direction of travel signified by many of the measures proposed in this consultation. However, we believe that there is a need for greater ambition on behalf of the Government if we are to significantly improve the performance and reduce the environmental impacts of the built environment.

The RIBA launched our 2030 Climate Challenge which calls for our Chartered Practices to meet net zero (or better) whole life carbon for new and retrofitted buildings by 2030. It sets a series of targets for practices to adopt to reduce operational energy, embodied carbon and potable water usage. Our responses to this consultation reflect these targets and other objectives including meeting internationally recognised standards.

For further information or if you have any questions on this response, please contact Phoebe MacDonald, Senior Policy & Public Affairs Advisor: Phoebe.MacDonald@riba.org 0207 307 3271

Chapter 2 The Future Homes Standard

1. **Do you agree with our expectation that a home built to the Future Homes Standard should produce 75-80% less CO_2 emissions than one built to current requirements?**
   a. Yes
   b. No – 75-80% is too high a reduction in CO_2
   c. No – 75-80% is too low a reduction in CO_2

   If no, please explain your reasoning and provide evidence to support this.

a. Yes

Homes built to the Future Homes Standard should produce 75-80% less CO_2 actual operational emissions than homes built to the current building regulations.

This reduction in CO_2 is in line with the RIBA's 2030 Climate Challenge targets, which tasks architects to reduce operational energy demand in domestic buildings by at least 75%.

It would be beneficial for the Government to create specific targets for carbon emissions with an absolute scale of $kgCO_2/m^2$, rather than comparing emissions to existing buildings. Carbon emission reductions that are relative to the buildings shape and size inherently benefit buildings of poor shape and design. Actual energy targets would encourage architects, developers and homeowners to be innovative with their designs.

Furthermore, a specific carbon target is a useful secondary metric as it includes not only operational energy but embodied carbon.

Both operational energy and embodied carbon are key metrics for the RIBA's 2030 Climate Challenge which calls for RIBA Chartered Practices to reach net zero whole life carbon by 2030.

The Government should also stipulate that the 75-80% reduction is before off-setting.

RIBA 2030 Climate Challenge target metrics for domestic buildings

RIBA Sustainable Outcome Metrics	Current Benchmarks	2020 Targets	2025 Targets	2030 Targets	Notes
Operational Energy $kWh/m^2/y$	146 kWh/m^2 /y (Ofgem benchmark)	< 105 $kWh/m^2/y$	< 70 $kWh/m^2/y$	< 0 to 35 $kWh/m^2/y$	UKGBC Net Zero Framework 1. Fabric First 2. Efficient services, and low-carbon heat 3. Maximise onsite renewables 4. Minimum offsetting using UK schemes (CCC)
Embodied Carbon $kgCO_2e/m^2$	1000 $kgCO_2e/m^2$ (M4i benchmark)	< 600 $kgCO_2e/m^2$	< 450 $kgCO_2e/m^2$	< 300 $kgCO_2e/m^2$	RICS Whole Life Carbon (A-C) 1. Whole Life Carbon Analysis 2. Using circular economy Strategies 3. Minimum offsetting using UK schemes (CCC)
Potable Water Use Litres/person/day	125 l/p/day (Building Regulations England and Wales)	< 110 l/p/day	< 95 l/p/day	< 75 l/p/day	CIBSE Guide G

2. **We think heat pumps and heat networks should typically be used to deliver the low carbon heating requirement of the Future Homes Standard. What are your views on this and in what circumstances should other low carbon technologies, such as direct electric heating, be used?**

The Future Homes Standard should stipulate that any new home requires low carbon heating and that it should not be attached to the gas grid or reliant on any fossil fuel.

Heat pumps and heat networks are two effective ways that new homes can achieve low carbon heating. It is essential, however, that heat pumps are designed, specified, installed and operated correctly to avoid high energy bills for the consumer.

As research and development continue, there may be new technologies and products that are low carbon and produce similar results to heat pumps, these should not be discounted.

However, the RIBA believes that fabric efficiency should be the primary consideration when designing a new home; any method of delivering heat should be secondary to fabric efficiency.

As mentioned above, it is important that any low carbon heating does not cause large energy bills for the home user; this should be taken into consideration in the Building Regulations. For example, direct electric heating should only be permitted if improved fabric energy efficiency is achieved.

3. **Do you agree that the fabric package for Option 1 (Future Homes Fabric) set out in Chapter 3 and Table 4 of the impact assessment provides a reasonable basis for the fabric performance of the Future Homes Standard?**
   a. Yes
   b. No – the fabric standard is too demanding
   c. No – the fabric standard is not demanding enough

   If no, please explain your reasoning.

c. No – the fabric standard is not demanding enough

Overall, the building fabric package set out is broadly in line with other fabric-based standards, such as *Passivhaus*, which the RIBA welcomes. In addition, the call for triple-glazed windows is positive.

However, it is important that the performance of thermal bridges is considered. Thermal bridges on highly insulated facades can be overlooked, leading to mould; the calculation of non-repeating thermal bridges is vital during the design process to ensure energy efficiency. The RIBA suggests that these be reviewed again in the Future Homes Standard post-2020.

In addition, the suggested minimum standard for air permeability is too high and should be reduced to 3m3/m2.h at 50Pa.

Finally, the Future Homes Standard 2020 suggests the removal of the fabric energy efficiency standard. Removing the fabric energy efficiency standard means that technology can be used under the 2020 proposals to mask poor building fabric. The current proposals create a risk that homes could be built with less insulation in 2020 than currently required under Part L 2013. No home built in 2020 should add to the retrofit burden because it was built with poor fabric efficiency.

The marginal cost of improving fabric efficiency is low; it is more expensive to retrofit fabric efficiency measures than to do it during construction. Keeping the fabric energy efficiency target is a positive measure to ensure that energy efficient fabrics are chosen for new homes.

4. **When, if at all, should the government commence the amendment to the Planning and Energy Act 2008 to restrict local planning authorities from setting higher energy efficiency standard for dwellings?**
   a. In 2020 alongside the introduction of any option to uplift the energy efficiency standards of Part L
   b. In 2020 but only in the event of the introduction of a 31% uplift (option 2) to the energy efficiency standards of Part L
   c. In 2025 alongside the introduction of the Future Homes Standard
   d. The government should not commence the amendment to the Planning and Energy Act

   Please explain your reasoning.

d. The government should not commence the amendment to the Planning and Energy Act

Setting a national energy efficiency standard for dwellings is the RIBA's preferred option as it allows for consistency and creates a national market for innovation in products and skills. If the national minimum standard is set at the correct level (i.e. is sufficiently ambitious but achievable) there would be no need for local authorities to go further. However, the RIBA has concerns that as currently proposed, the Future Home Standard may not be sufficient to meet the ambitious levels we need to address the impact of climate change in new dwellings.

Therefore, the RIBA suggests that the Future Home Standard be updated to include a requirement for:

1. Adequate fabric efficiency standards to ensure that homes built today do not require retrofitting in the future. This includes reducing the current air permeability levels in the Future Homes Standard which are too high;
2. All heating to be low carbon and off the gas grid;
3. Standalone incentives to encourage solar PV deployment on buildings regardless of the level of fabric efficiency or presence of low carbon heating; and
4. Setting actual energy targets, rather than the current system in which there are no specific level of emissions being mandated; reductions are relative to the buildings shape and size which inherently benefits buildings of poor shape and design. Actual energy targets would encourage architects, developers and homeowners to be innovative with their design.

To date, the ability for local authorities to set higher energy efficiency standards has been well received. Research highlighted that over half (51%) of all local authorities have implemented standards that go above national requirements.[1]

Until a sufficient national standard for Future Homes, the Planning and Energy Act should not be amended.

5. **Do you agree with the proposed timings presented in Figure 2.1 showing the Roadmap to the Future Homes Standard?**
   a. Yes
   b. No – the timings are too ambitious
   c. No – the timings are not ambitious enough

   If no, please explain your reasoning.

c. No – the timings are not ambitious enough

To ensure that the UK meets it climate change commitments it must move as quickly as possible to reduce the impact of carbon emissions from the built environment. Therefore, some key dates should be amended.

The first key date that should be amended is the "implementation and coming-into force" of the Future Homes Standard. The Future Homes Standard must be fully implemented by 1 January 2025 to ensure that no building after this date requires retrofitting in the future.

To ensure that this 1 January 2025 date is achievable, other stages in the process must begin earlier than the consultation suggests. The RIBA recommends the establishment of the "Future Homes Standard Industry Task Force" to start immediately after Part L 2020 is published.

The Future Homes Standard should focus on delivering as-built performance. For this to be successful, testing during construction and occupation is required. Therefore, moving the Task Force a year earlier will allow for the timings to incorporate a period of comprehensive testing.

A period of comprehensive testing will help ensure that the Future Homes Standard is meeting the required energy reductions and that there are no unintended consequences.

The testing period should be a minimum of one year; but, should ideally include two winters for energy performance and air quality monitoring.

[1] Half of councils beating out national policy on building standards as Future Homes Standard slammed, https://www.solarpowerportal.co.uk/news/51_of_councils_beating_out_national_policy_on_building_standards_as_future

Chapter 3 Part L Standards for New Homes in 2020

6. **What level of uplift to the energy efficiency standards in the Building Regulations should be introduced in 2020?**
   a. No change
   b. Option 1 – 20% CO_2 reduction
   c. Option 2 – 31% CO_2 reduction (the government's preferred option)
   d. Other

   Please explain your reasoning.

d. Other

The key issue with the options provided is that they are compared to reductions in current standards.

Currently, there are no specific levels of carbon emissions or operational energy targets mandated. This method is flawed as it inherently benefits buildings of poor shape and design.

Therefore, the RIBA recommends setting actual operational energy efficiency targets for homes. Setting actual operational energy targets encourages architects, developers and homeowners to be innovative with their design.

The RIBA suggests that reduction targets should align with our 2030 Climate Challenge.

For 2020, this is a 20% reduction of operational energy compared to the Office of Gas and Electricity Markets (Ofgem) benchmarks.

Going forward, the RIBA 2030 Climate Challenge should be used as guidelines for further uplift in the Future Homes Standard, with 2020 delivering the first increment towards this.

The 2030 Climate Challenge operational energy targets are below:

2020 Target - < 105 kWh/m² /y
2025 Target - < 70 kWh/m² /y
2030 Target - < 0 to 35 kWh/m² /y

7. **Do you agree with using primary energy as the principal performance metric?**
   a. Yes – primary energy should be the principal performance metric
   b. No – CO_2 should remain the principal performance metric
   c. No – another measure should be the principal performance metric

   Please explain your reasoning and provide evidence to support this.

c. No – another measure should be the principal performance metric

Primary energy does not provide consumers with actual building performance and does not encourage building performance directly, as it is heavily dependent on the wider energy system.

The RIBA suggests that operational energy (kWh/m²/yr) should be the preferred way to measure and demonstrate energy use intensity (EUI).

Operational energy is the amount of actual energy use of a building. This should be calculated from the design stage and reviewed in a Post Occupancy Evaluation (POE). POE is essential to ensure that a home is working as it was intended.

8. **Do you agree with using CO_2 as the secondary performance metric?**
   a. Yes
   b. No

   Please explain your reasoning.

a. Yes

Continuing to use CO_2 as a secondary metric is important because it is a well-known metric, it ensures continuity and allows comparison with previous targets.

However, the RIBA also suggests another key metric should be included; embodied carbon.

Embodied carbon is emissions generated from the processes associated with sourcing materials, fabricating them into products and systems, transporting them to site and assembling them into a building. They also include the emissions generated from maintenance, repair and replacement, as well as final demolition and disposal.

Currently, there is some guidance on appropriate levels of embodied carbon for buildings. However, the lack of specific regulations has meant that this guidance has not been widely utilised.

Excluding embodied carbon calculations when constructing a new home would be an oversight, as the materials used in constructing any new building has a large impact on the total level of carbon emitted.

The embodied carbon metrics should be calculated in accordance with the *RICS Whole Life Carbon Assessment for the Built Environment*, which aligns with BS EN 15978. This metric is widely accepted within the built environment as an appropriate way to measure embodied carbon.

The RIBA suggests the following embodied carbon targets for dwellings:

Current benchmark	2020 Target	2025 Target	2030 Target
1000 $kgCO_2e/m^2$ (M4i benchmark)	< 600 $kgCO_2e/m^2$	< 450 $kgCO_2e/m^2$	< 300 $kgCO_2e/m^2$

9. **Do you agree with the proposal to set a minimum target to ensure that homes are affordable to run?**
   a. Yes
   b. No

   Please explain your reasoning.

a. Yes

The RIBA agrees with the implementation of a minimum target to ensure that developers do not simply implement energy saving measures without thought of the cost to the homeowner.

Currently, one in ten households in England are fuel poor and energy inefficiency can be a key driver of fuel poverty. Therefore, addressing energy efficiency is a positive step to addressing fuel poverty in England. New housing should aim to alleviate fuel poverty rather than exacerbate it.

In addition, it is reasonable to assume that some developers may choose a path of least economic resistance in approaching compliance with the Future Homes Standard, which might impact affordability; therefore, minimum affordability targets are required.

The minimum affordability target mechanism must be robust to ensure that it cannot be manipulated.

10. **Should the minimum target used to ensure that homes are affordable to run be a minimum Energy Efficiency Rating?**
    a. Yes
    b. No

    If yes, please suggest a minimum Energy Efficiency Rating that should be achieved and provide evidence to support this.

    If not, please suggest an alternative metric, explain your reasoning and provide evidence to support this.

b. No

The RIBA agrees that a minimum target should be used to ensure that homes are affordable to run.

However, existing metrics do not provide a suitable basis for setting a minimum energy efficiency rating for ensuring affordability in use. SAP does not include unregulated energy sources, which is a primary cause of the well-documented performance gap between design and the actual operation of a building.

The Energy Efficiency Rating is part of the current Energy Performance Certificate (EPC); EPCs have proven to be extremely inaccurate when compared to actual energy usage.

It is important that the affordability rating of a new home is as accurate as possible and for this reason, the Energy Efficiency Rating should not be used.

The RIBA suggests using a revised Standard Assessment Procedure that includes unregulated energy sources (which the RIBA suggests consulting on) to calculate the affordability of energy usage in a new home. This should then be reviewed a year after the property has been occupied with a POE which measures actual energy use.

This would ensure that the original estimation for the affordability rating was accurate and would provide homeowners the opportunity to adjust and become more energy efficient. Metered energy consumption considers fabric efficiency, heating system efficiency and the use of renewables.

Furthermore, Government must recognise that there are regional differences in affordability, and this should be reflected in the target.

11. Do you agree with the minimum fabric standards proposed in table 3.1?

If you do not agree with any one or more of the proposed standards, please explain your reasoning and provide evidence to support this.

The RIBA does not agree with proposed minimum fabric standards and these should be revised.

Fabric performance should always be the first step in reducing carbon emissions as part of a hierarchical approach to energy savings. Therefore, the U-values should be revised, and the fabric energy efficiency standard should not be removed.

The RIBA suggests the following U-values:

Solid Walls	0.1 – 0.15 W/m².K
Roof	0.1 – 0.12 W/m².K
Ground Floor	0.1 – 0.12 W/m².K
Curtain Walling including frame	1.2 W/m².K
Windows including frame	1.2 W/m².K
Doors including frame	1.8 W/m².K

Furthermore, the minimum standard for air permeability is too high and should be reduced to 3m3/m2.h at 50Pa.

The RIBA recommends modelling be undertaken to investigate whether higher performance standards applied to multiple elements and the minimum standard applied to one element could lead to risk of damp and moisture formation on the underperforming element.

12. **Do you think that the minimum fabric standards should be set in the Building Regulations or in the Approved Document (as is the current case)?**
    a. In the Building Regulations
    b. In the Approved Document

    Please explain your reasoning.

a. In the Building Regulations

The RIBA suggests that including the minimum fabric standards in the Building Regulations is likely to result in a more robust implementation.

13. **In the context of the proposed move to a primary energy metric and improved minimum fabric standards, do you agree with the proposal to remove the fabric energy efficiency target?**
    a. Yes
    b. No

    If no, please explain your reasoning.

b. No

As mentioned above, the key metrics for energy efficiency should be operational energy, embodied carbon and CO_2. The fabric energy efficiency target, however, is still a useful tool.

The marginal cost of improving fabric efficiency is low; it is more expensive to retrofit fabric efficiency measures than to do it during construction. Keeping the fabric energy efficiency target is a positive measure to ensure that energy efficient fabrics are chosen for new homes.

Furthermore, removing the fabric energy efficiency target means that technology can be used under the 2020 proposals to mask poor building fabric. Under the current proposals, homes can be built with less insulation in 2020 than required under Part L 2013. New homes should not add to the retrofit burden due to being built with poor building fabric in 2020.

14. **Do you agree that the limiting U-value for roof-lights should be based on a roof-light in a horizontal position?**
    a. Yes
    b. No

    If no, please explain your reasoning and provide evidence to support this.

a. Yes

15. **Do you agree that we should adopt the latest version of BR 443?**
    a. Yes
    b. No

    If no, please explain your reasoning and provide evidence to support this.

a. Yes

16. **Do you agree with the proposal of removing the fuel factors to aid the transition from high-carbon fossil fuels?**
    a. Yes
    b. No

    If no, please explain your reasoning.

a. Yes

17. **Do you agree with the proposed changes to minimum building services efficiencies and controls set out in table 3.2?**

    If you do not agree with any one or more of the proposed changes, please explain your reasoning and provide evidence to support this.

The RIBA agrees with the proposed changes to minimum building services efficiencies and controls.

18. **Do you agree with the proposal that heating systems in new dwellings should be designed to operate with a flow temperature of 55°C?**
    a. Yes
    b. No – the temperature should be below 55°C
    c. No – dwellings should not be designed to operate with a low flow temperature
    d. No – I disagree for another reason

    If no, please explain your reasoning and provide evidence.

19. **How should we encourage new dwellings to be designed to operate with a flow temperature of 55°C?**
    a. By setting a minimum standard
    b. Through the target primary energy and target emission rate (i.e. through the notional building)
    c. Other

    Please explain your reasoning.

20. **Do you agree with the proposals to simplify the requirements in the Building Regulations for the consideration of high-efficiency alternative systems?**
    a. Yes
    b. No

    If no, please explain your reasoning.

a. Yes

The RIBA agrees with the proposals to simplify the requirements in the Building Regulations for the consideration of high-efficiency alternative systems; however, these must be non-fossil fuel.

21. **Do you agree with the proposal to adopt the latest Standard Assessment Procedure, SAP 10?**
    a. Yes
    b. No

    If no, please explain your reasoning.

b. No

SAP (and SBEM) were not developed to predict energy consumption and they do not relate to real world energy and carbon performance. Therefore, SAP and SBEM are inappropriate methodologies to reduce the climate impact of the built environment.

SAP is based on a per cent reduction from notional baseline building measurements which does not address poor design. In addition, SAP uses a gas boiler as default in the notional building which inflates the improvement in a new building if a more energy efficient heating system (for example, a heat pump) is used.

SAP cannot deliver the improvements needed for designing to an operational energy standard. This is a significant hurdle to delivering net zero buildings.

SAP should be replaced with a more sophisticated advanced modelling methodology that can more accurately model building performance.

Government should consult on this new tool and look to existing models, such as the Australian NABERS, CIBSE's tools on evaluating operational energy performance of buildings at the design stage (TM54 and DomEARM), Passivhaus Planning Package (PHPP) and Dynamic Thermal Simulation (DTS), as a starting point.

22. **Do you agree with the proposal to update the source of fuel prices to BEIS Domestic energy price indices for SAP 10.2?**
    a. Yes
    b. No

    If no, please explain your reasoning.

b. No

As mentioned above, SAP does not relate to real world energy and carbon performance and cannot deliver the improvements needed for designing to an operational energy standard.

23. **Do you agree with the method in *Briefing Note – Derivation and use of Primary Energy factors* in SAP for calculating primary energy and CO_2 emissions factors?**
    a. Yes
    b. No

    If no, please explain your reasoning.

b. No

As mentioned above, SAP does not relate to real world energy and carbon performance and cannot deliver the improvements needed for designing to an operational energy standard.

Furthermore, the RIBA does not agree with the use of primary energy as a metric for energy efficiency.

24. **Do you agree with the removal of government Approved Construction Details from Approved Document L?**
    a. Yes
    b. No

    If no, please explain your reasoning.

b. No

The current Approved Construction Details are outdated, rarely used and irrelevant for many projects.

Nevertheless, there is a lack of information on linear thermal bridge performance compared to standard methods of construction. The Approved Details provide a reference to current default values used in thermal modelling and therefore should not be removed. Thermal bridge performance will become more critical as U-values improve.

The Scottish Approved Details have been updated and improved and could be used as a model for updating the English Details.

25. **Do you agree with the proposal to introduce the technology factors for heat networks, as presented in the draft Approved Document?**
    a. Yes
    b. No, they give too much of an advantage to heat networks
    c. No, they do not give enough of advantage to heat networks
    d. No, I disagree for another reason

    Please explain your reasoning.

26. **Do you agree with the removal of the supplementary guidance from Approved Document L, as outlined in paragraph 3.59 of the consultation document?**
    a. Yes
    b. No

    If no, please explain your reasoning.

b. No

Daylight guidance, future temperatures (thermal comfort) and commissioning are, or will be, critical issues in the development of new dwelling projects. Daylight and thermal comfort are both important for occupant wellbeing and the removal of this guidance risks these aspects of the user experience being ignored.

We recognise the need for the guidance to be streamlined; however, the RIBA suggests that this supplementary guidance is rewritten to be more succinct rather than removed.

27. **Do you agree with the external references used in the draft Approved Document L, Appendix C and Appendix D?**
    a. Yes
    b. No

    If no, please explain your reasoning and suggest any alternative sources.

a. Yes

28. **Do you agree with incorporating the Compliance Guides into the Approved Documents?**
    a. Yes
    b. No

    If no, please explain your reasoning.

a. Yes

29. **Do you agree that we have adequately covered matters which are currently in the Domestic Building Services Compliance Guide in the new draft Approved Document L for new dwellings?**
    a. Yes
    b. No
    If no, please explain which matters are not adequately covered.

30. **Do you agree that we have adequately covered matters which are currently in the Domestic Ventilation Compliance Guide in the new draft Approved Document F for new dwellings?**
    a. Yes
    b. No

    If no, please explain which matters are not adequately covered.

31. **Do you agree with the proposals for restructuring the Approved Document guidance?**
    a. Yes
    b. No

    If no, please explain your reasoning.

a. Yes

32. **Do you agree with our proposed approach to mandating self-regulating devices in new dwellings?**
    a. Yes
    b. No

    If no, please explain your reasoning.

a. Yes

Installing self-regulating devices are standard in new builds.

33. **Are there circumstances in which installing self-regulating devices in new dwellings would not be technically or economically feasible?**
    a. Yes
    b. No

    If yes, please explain your reasoning and provide evidence.

b. No

34. Do you agree with proposed guidance on providing information about building automation and control systems for new dwellings?
a. Yes
b. No

If no, please explain your reasoning.

a. Yes

The RIBA agrees with the proposed guidance that information on building automation systems should be provided to building users. It is important that this information is of a high standard, clear and easy for users to understand.

Chapter 4 Part F Changes

35. **Do you agree that the guidance in Appendix B to draft Approved Document F provides an appropriate basis for setting minimum ventilation standards?**
    a. Yes
    b. No

    If no, please explain your reasoning.

36. **Do you agree that using individual volatile organic compounds, informed by Public Health England guidelines, is an appropriate alternative to using a total volatile organic compound limit?**
    a. Yes
    b. No – the Public Health England guidelines are not sufficient
    c. No – individual volatile organic compounds should not be used to determine ventilation rates
    d. No – I disagree for another reason

    If no, please explain your reasoning, and provide alternative evidence sources if appropriate.

a. Yes

The RIBA agrees that using individual volatile organic compounds (VOC) is an appropriate alternative to using a total VOC limit. However, it should be noted that the issue of internal air quality is not one simply of whether individual or total VOCs should be used for establishing guidelines but a general lack of consideration and measurement of VOC levels in new dwellings.

Indoor pollutants are rarely, if ever, measured post-practical completion except for in limited academic research. If VOC levels for new dwellings are to be a focus for Future Homes Standard then the documents should direct developers to measuring indoor air quality, both at completion and in-use.

In addition, the Approved Documents should provide guidance on adequate ventilation and highlight to designers and developers the importance of: specifying less noxious materials; give greater consideration of extract of pollutants at source; and consideration of how buildings are used by occupants.

This would consider activities like food preparation and drying clothes (for example, the direct extract of cooker hoods should be the default and the provision of areas with dedicated extract for drying clothes in apartments).

37. **Do you agree with the proposed guidance on minimising the ingress of external pollutants in the draft Approved Document F?**
    a. Yes
    b. No

    If no, please explain your reasoning.

a. Yes

The recommendations represent good practice and reflect approaches that are currently being used on new dwelling developments in urban areas.

38. **Do you agree with the proposed guidance on noise in the draft Approved Document F?**
    a. Yes
    b. No – this should not form part of the statutory guidance for ventilation, or the guidance goes too far
    c. No – the guidance does not sufficiently address the problem
    d. No – I disagree for another reason

    If no, please explain your reasoning.

a. Yes

The recommendations reflect good practice in the in design of new dwellings for addressing the risk of noise.

39. **Do you agree with the proposal to remove guidance for passive stack ventilation systems from the Approved Document?**
    a. Yes
    b. No

    If no, please explain your reasoning.

b. No

The RIBA understands and recognises that passive stack ventilation is rarely used in domestic construction; however, it has the potential to be useful in the future if overheating homes is an issue.

Passive stack ventilation can give homeowners the ability to employ strategies to allow for night cooling, for example, to provide comfort using a low level and high-level openings in locations where security might be an issue. Therefore, the guidance should not be removed from the Approved Documents.

40. **Do you agree with the proposal to remove guidance for more airtight naturally ventilated homes?**
    a. Yes
    b. No

    If no, please explain your reasoning.

b. No

The RIBA recognises that there can be tension between airtightness to achieve energy efficiency in naturally ventilated dwellings and indoor air quality and thermal comfort. However, addressing the issue of indoor air quality should include consideration of internal finishes, the location and nature of dedicated extract to bathrooms and kitchens; and the provision of drying areas for clothes, rather than simply focus on the issue of airtightness.

It is our recommendation that the guidance is amended to reflect this rather than removed entirely.

41. **Do you agree with the proposal to remove guidance for less airtight homes with mechanical extract ventilation?**
    a. Yes
    b. No

    If no, please explain your reasoning.

a. Yes

The RIBA agrees with the proposal to remove the guidance for less airtight homes with mechanical extract ventilation with the condition that there is a strict airtightness target of 3m3/m2.h at 50Pa introduced.

42. **Do you agree with the proposed guidance for background ventilators in naturally ventilated dwellings in the draft Approved Document F?**
    a. Yes
    b. No – the ventilator areas are too large
    c. No – the ventilator areas are too small
    d. No – I disagree for another reason

    If no, please explain your reasoning.

a. Yes

43. **Do you agree with the proposed approach in the draft Approved Document for determining minimum whole building ventilation rates in the draft Approved Document F?**
    a. Yes
    b. No – the ventilation rate is too high
    c. No – the ventilation rate is too low
    d. No – I disagree for another reason

    If no, please explain your reasoning.

44. **Do you agree that background ventilators should be installed for a continuous mechanical extract system, at 5000mm2 per habitable room?**
    a. Yes
    b. No – the minimum background ventilator area is too low
    c. No – the minimum background ventilator area is too high
    d. No – other

    If no, please explain your reasoning.

a. Yes

The RIBA agrees that background ventilators should be installed for continuous mechanical extract system at 5000mm2 per habitable room.

45. **Do you agree with the external references used in the draft Approved Document F, in Appendices B, D and E?**
    a. Yes
    b. No

    If no, please explain your reasoning and suggest any alternative sources.

46. **Do you agree with the proposed commissioning sheet proforma given in Appendix C of the draft Approved Document F, volume 1?**
    a. Yes
    b. No

    If no, please explain your reasoning.

47. **Do you agree with the proposal to provide a completed checklist and commissioning sheet to the building owner?**
    a. Yes
    b. No

    If no, please explain your reasoning.

a. Yes

Including a completed checklist and commissioning sheet to the building owner would be a positive step to improving building owner confidence in the quality of new homes.

Chapter 5 Airtightness

48. Do you agree that there should be a limit to the credit given in SAP for energy savings from airtightness for naturally ventilated dwellings?
a. Yes
b. No

If no, please explain your reasoning.

b. No

As mentioned above, SAP does not relate to real world energy and carbon performance and cannot deliver the improvements needed for designing to an operational energy standard.

SAP should be replaced with a domestic version of design for performance tool. Government should consult on this new tool and look to existing models, such as NABERS, TM54 and DOMEARM, as a starting point.

The new system should, however, consider that in cases where ventilation is provided solely by windows, doors, rooflights and trickle vents, or if it can be demonstrated that the greater airtightness has resulted in the increased dependency on mechanical ventilation or poorer air quality, that there should be a limit to the number of credits given.

The RIBA recognises that there can be issues with air quality in naturally ventilated buildings with high levels of airtightness; however, addressing these issues should include the consideration of internal finishes, the location and nature of dedicated extract to bathrooms and kitchens; and the provision of drying areas for clothes, rather than simply focus on the issue of airtightness.

49. Do you agree that the limit should be set at 3m3/m2.h?
a. Yes
b. No – it is too low
c. No – it is too high

If no, please explain your reasoning and provide evidence.

50. Is having a standard level of uncertainty of 0.5 m3/m2.h appropriate for all dwellings undergoing an airtightness test?
a. Yes
b. No – a percentage uncertainty would be more appropriate
c. No – I agree with having a standard level of uncertainty, but 0.5 m3/m2.h is not an appropriate figure.
d. No – I disagree for another reason

If no, please explain your reasoning.

d. No – I disagree for another reason

It is not appropriate for all dwellings to have a standard level of uncertainty. The limit should be 3m3/m2.h and this should be an absolute target that all buildings should achieve. The uncertainty of 0.5m3/m2.h is similar to the actual airtightness already achieved by some buildings.

51. Currently only a proportion of new dwellings are required to be airtightness tested. Do you agree with the proposal that all new dwellings should be airtightness tested?
a. Yes
b. No

If no, please explain your reasoning and provide evidence to support this.

a. Yes

There is evidence that some new dwellings are not sufficiently airtight. Airtightness is key to ensure a building retains heat and therefore all new dwellings should be tested.

The RIBA understands that testing all new dwellings will increase the costs, but we believe that this will significantly improve the quality and consistency of new homes. We understand that there have been cases where the units identified to be part of the air pressure test are built to pass the test, but the same level of detail is not applied to units that are not being tested.

52. **Currently, small developments are excluded from the requirement to undergo any airtightness tests. Do you agree with including small developments in this requirement?**
    a. Yes
    b. No

    If no, please explain your reasoning and provide evidence to support this.

a. Yes

The RIBA understands that poor quality buildings standards, which a failed airtightness test can highlight, can sometimes be more acute on small developments built by small contractors and developers. Airtightness is key to ensure a building retains heat and therefore all new dwellings of developments of all sizes should be tested.

53. **Do you agree that the Pulse test should be introduced into statutory guidance as an alternative airtightness testing method alongside the blower door test?**
    a. Yes
    b. No

    If no, please explain your reasoning.

b. No

The RIBA does not agree that the Pulse test should be introduced into statutory guidance as an alternative testing method for airtightness. Air pressure testing at +/- 50Pa is standard across the EU. It is built into various fabric performance standards, including *Passivhaus,* and produces results which may be compared across regions and historically.

Any new technology should be able to test down to 0.1m3/m2.h at 50Pa, new buildings are already achieving this level of airtightness.

54. **Do you think that the proposed design airtightness range of between 1.5 m3/m2.h and the maximum allowable airtightness value in Approved Document L Volume 1 is appropriate for the introduction of the Pulse test?**
    a. Yes
    b. No

    If no, please explain your reasoning and provide evidence to support this.

b. No

The RIBA does not agree that the Pulse test should be introduced into statutory guidance as an alternative testing method for airtightness.

55. **Do you agree that we should adopt an independent approved airtightness testing methodology?**
    a. Yes
    b. No

    Please explain your reasoning.

a. Yes

The Government should adopt an independent approved airtightness testing methodology. This methodology should include both pressurisation and depressurisation testing and taking the average of the two results; *Passivhaus* certification uses this methodology.

An advantage of using this approach is that it is more robust and places greater emphasis on window performance. The depressurisation test can be particularly revealing of leakage paths around window casement seals, where inadequate or poorly tuned gearing mechanisms fail to hold the window casement tightly in the frame.

56. **Do you agree with the content of the CIBSE draft methodology which will be available via the link in the consultation document? Please make any comments here.**

Chapter 6 Compliance, Performance and Providing Information

57. Do you agree with the introduction of guidance for Build Quality in the Approved Document becoming part of the reasonable provision for compliance with the minimum standards of Part L?
a. Yes
b. No

Please explain your reasoning and provide evidence to support this.

a. Yes

The introduction of guidance on build quality is a positive step to ensuring compliance with the minimum standards in Part L. However, the provision of guidance will be insufficient to ensure quality and therefore any guidance should be considered as part of a wider suite of measures.

58. Do you have any comments on the Build Quality guidance in Annex C?

The build quality guidance relating to thermal bypass is useful, including the that the insulation board and joints should be taped and sealed. It would be useful to apply this advice to insultation roll and loose lay insultation. We suggest the guidance be amended to say: “loose lay and insulation roll should be fully encapsulated...”.

In addition, guidance on airtightness and build quality should include the use of suitable flexible tap seals alongside “mechanical means, compressible seals and expanding foam.”

59. Do you agree with the introduction of the standardised compliance report, the Building Regulations England Part L (BREL) report, as presented in Annex D?
a. Yes
b. No there is no need for a standardised compliance report
c. No – I agree there should be a standardised compliance report but do not agree with the draft in Annex D

If no, please explain your reasoning

c. No – I agree there should be a standardised compliance report but do not agree with the draft in Annex D

Broadly the compliance report in Annex D is in line with a compliance report that RIBA would expect to see. However, the RIBA does not agree with the inclusion of the target emission rate, dwelling emission rate, target primary energy rate and dwelling primary energy. These should be replaced with the operational energy target calculation, the embodied carbon calculation, CO_2 emissions and the fabric efficiency target.

In addition, the compliance report should be reviewed within a year of practical completion and verified as an element of a light touch POE.

60. **Do you agree with the introduction of photographic evidence as a requirement for producing the as-built energy assessment for new dwellings?**
    a. Yes
    b. No

    If no, please explain your reasoning.

a. Yes

Photographic records are a useful tool to help understand the as-built assessment of the energy performance of a new building.

Photographs are currently used for *Passivhaus* buildings as part of the evaluation process. The photographs are reviewed by the *Passivhaus* certifier as a step towards gaining certification.

However, this approach is successful because the *Passivhaus* certifier has sufficient time, resource and expertise to review the photographic record against construction drawings. The certifier also has the authority to withhold certification. In addition, the photographs are reviewed alongside the results of forensic airtightness tests (undertaken before the final test).

If photographic evidence is to be used for an as-built assessment of energy performance, as part of the Future Homes Standard, then a role similar to the *Passivhaus* certifier will be required.

In addition, if photographic records are to be part of evaluation process, then thermographic photographs should also be considered to evaluate the integrity of the thermal envelope.

It should be noted, however, that the submission of photographic evidence alone will be insufficient to address quality issues and should be part of suite of measures to address build quality that includes forensic testing, post-construction testing and greater supervision.

On site construction standards are a significant issue and whilst the requirement of a photographic record is positive step the questions of oversight, supervision and enforcement of building standards and design intent still remain.

61. **Do you agree with the proposal to require the signed standardised compliance report (BREL) and the supporting photographic evidence to be provided to Building Control?**
    a. Yes
    b. No

    If no, please explain your reasoning

a. Yes

The RIBA agrees that the signed standardised compliance report and the supporting photographic evidence should be provided to Building Control.

However, this information should be reviewed and acted on in accordance with the other information provided, for example, air pressure test certificates. All the information provided should be reviewed as a whole, rather than through a piecemeal approach.

It should also be noted that photographic evidence should not be used as a substitution for site attendance. A lack of supervision on site can lead to poor quality construction.

Whilst a photographic record is a step in the right direction, it will require a professional with the time and expertise to review the photographs and possess the relevant authority to compel contractors to address the issues.

62. **Do you agree with the proposal to provide homeowner with the signed standardised compliance report (BREL) and photographic evidence?**
    a. Yes
    b. No

    Please explain your reasoning.

a. Yes

The RIBA believe that providing homeowners with information about the build quality of their new homes is a positive measure.

However, it is currently unclear how much homeowners will benefit from the signed compliance report and photographic record. The report and photographic records will be useful for legal disputes brought by the homeowner but, in the case of the photographs, without some specialist knowledge or input, it will not be clear what represents standard construction practice and what is a problem.

We recommend that this proposal is trialled with homeowners before implementation.

63. Do you agree with the proposal to specify the version of Part L that the home is built to on the EPC?
a. Yes
b. No

Please explain your reasoning.

b. No

Including the version of Part L that the home is built to would help inform the context of the certificate.

However, the RIBA does not agree that EPCs are the best measure of energy efficiency and actual in-use operational energy should be measured and captured. The Part L that a building is designed to should be included in a reformed EPC.

64. Do you agree Approved Document L should provide a set format for a home user guide in order to inform homeowners how to efficiently operate their dwelling?
a. Yes
b. No

If yes, please provide your views on what should be included in the guide.

If no, please explain your reasoning.

a. Yes

Standardising a home user guide is useful for the homeowner, occupant and home builder as it allows for uniformity and reliability. A uniform guide also allows for comparisons which can easily highlight strengths and weaknesses.

The BREEAM Home Users Guide suggests that a guide should include the following information:

- Energy efficiency – information on energy-efficient features and strategies relating to the home and provide an overview of the reasons for their use, e.g. economic and environmental savings. Including a user guide in plain English on technologies and appliances.
- Water use – details of water saving features and their use and benefits, e.g. low/dual flush toilets, low water use showers, low water use white goods (washing machines, dishwashers etc), and tips as well as details of external water use and efficiency, e.g. the use of water butts or other type of rainwater recycling systems.
- Transport facilities – including details of resident car-parking and cycle storage provision, cycle paths in the area including if available cycle path network maps for the whole town/local area plus local public transport information, maps and timetables where relevant (i.e. this may not be relevant to existing occupied homes). Information on alternative methods of transport such as park and ride, car sharing schemes and/or car

pools/car hire in the area and local ‘green’ transport initiatives should be included.
- Materials & waste
- Emergency information
- Local amenities
- Provision of information in alternative formats

These are key pieces of information that any home user guide should include. Clarity of information should be paramount in the development of the home user guide template.

Chapter 7 Transitional Arrangements

65. **Do you agree that the transitional arrangements for the energy efficiency changes in 2020 should not apply to individual buildings where work has not started within a reasonable period – resulting in those buildings having to be built to the new energy efficiency standard?**
a. Yes – where building work has commenced on an individual building within a reasonable period, the transitional arrangements should apply to that building, but not to the buildings on which building work has not commenced
b. No – the transitional arrangements should continue to apply to all building work on a development, irrespective of whether or not building work has commenced on individual buildings

If yes, please suggest a suitable length of time for the reasonable period in which building work should have started.

If no, please explain your reasoning and provide evidence to support this.

a. Yes – where building work has commenced on an individual building within a reasonable period, the transitional arrangements should apply to that building, but not to the buildings on which building work has not commenced

The RIBA suggests that a reasonable period in which the work should have started is 12 months.

66. **Do you foresee any issues that may arise from the proposed 2020 transitional arrangements outlined in this consultation?**
a. Yes
b. No

Please explain your reasoning and provide evidence to support this.

b. No

Currently, some developers may make a partial start to a development and then stop in order to build to earlier Building Regulations. The new transitional arrangements must ensure that this loophole is closed.

Should a project start and stop, to continue with the previous Building Regulations, any works that have started must be meaningful and substantial.

For example, enabling works should not be included as a meaningful start. A meaningful start would be one which involved some physical construction work.

67. **What is your view on the possible transitional arrangements regarding changes to be made in 2025?**

The transitional arrangements for Future Homes Standard in 2025 should be 12 months, as is suggested for 2020.

Chapter 8 Feedback on the Impact Assessment

68. The Impact Assessment makes a number of assumptions on fabric/services/ renewables costs, new build rates, phase-in rates, learning rates, etc for new homes. Do you think these assumptions are fair and reasonable?
a. Yes
b. No

Please explain your reasoning and provide evidence to support this.

b. No

The modelling in the Impact Assessment is based on SAP which the RIBA believes to be inherently flawed. The data is misleading as it does not relate to real world operational outcomes.

As mentioned above, the RIBA recommends consulting on a design for performance tool and then cost-benefit analysis and modelling can be used.

69. Overall, do you think the impact assessment is a fair and reasonable assessment of the potential costs and benefits of the proposed options for new homes?
a. Yes
b. No

If no, please explain your reasoning and provide evidence to support this.

a. No

The modelling in the Impact Assessment is based on SAP which the RIBA believes to be inherently flawed. The data is misleading as it does not relate to real world operational outcomes.

As mentioned above, the RIBA recommends consulting on a design for performance tool and then cost-benefit analysis and modelling can be used.