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

October 2019
Ministry of Housing, Communities and Local Government

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October 2019

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Scope of the consultation

Topic of this consultation:	The 2019 Spring Statement includes a commitment that, by 2025, we will introduce a Future Homes Standard for new build homes to be future-proofed with low carbon heating and world-leading levels of energy efficiency. Energy efficiency requirements for new homes are set by Part L (Conservation of Fuel and Power) and Part 6 of the Building Regulations. This consultation sets out our plans for achieving the Future Homes Standard, including proposed options to increase the energy efficiency requirements for new homes in 2020 as a meaningful and achievable stepping stone to the Future Homes Standard. This consultation is the first stage of a two-part consultation about proposed changes to building regulations. It also covers the wider impacts of Part L for new homes, including changes to Part F (Ventilation), its associated Approved Document guidance, airtightness and improving 'as built' performance of the constructed home.
Scope of this consultation:	The UK has set in law a target to bring all its greenhouse gas emissions to net zero by 2050 – one of the most ambitious targets in the world. Homes – both new and existing – account for 20% of emissions. Despite progress reducing emissions from homes, we need to go much further. New homes being built now and in the next 5-10 years will still exist in 2050 and therefore we must ensure that the energy efficiency standards we set for them put us on track to meet the 2050 target. As part of the journey to 2050 we have committed to introducing the Future Homes Standard in 2025. This consultation sets out what we think a home built to the Future Homes Standard will be like. We expect that an average home built to it will have 75-80% less carbon emissions than one built to current energy efficiency requirements (Approved Document L 2013). We expect this will be achieved through very high fabric standards and a low carbon heating system. This means a new home built to the Future Homes Standard might have a heat pump, triple glazing and standards for walls, floors and roofs that significantly limit any heat loss. We need to help the industry reach a position where it can deliver in 2025. We propose introducing in 2020 a meaningful but achievable uplift to energy efficiency standards as a stepping stone to the Future Homes Standard. The intention is to make new homes more energy efficient and to future-proof them in readiness for low carbon heating systems.

	We expect to launch a further consultation in the coming months addressing existing domestic buildings, and new and existing non-domestic buildings. This initial consultation relates to new domestic buildings; and includes changes to Part F (Ventilation). The initial consultation addresses: • options to uplift standards for Part L of the Building Regulations in 2020; and changes to Part F • more stringent transitional arrangements for these standards to encourage quicker implementation • draft outline specification for future consultation about the Future Homes Standard • clarifying the role of planning authorities in setting energy efficiency standards. The consultation sets out two options to uplift energy efficiency standards and requirements: • Option 1: 20% reduction in carbon emissions compared to the current standard for an average home. We anticipate this could be delivered by very high fabric standards (typically with triple glazing and minimal heat loss from walls, ceilings and roofs). • Option 2: 31% reduction in carbon emissions compared to the current standard. We anticipate this could be delivered based on the installation of carbon-saving technology such as photovoltaic (solar) panels and better fabric standards, though not as high as in option 1 (typically double not triple glazing). Option 2 is our preferred option. It would deliver more carbon savings and result in lower bills for the householder but has higher build costs. We also expect that it would help to prepare supply chains for heat pumps and increase the number of trained installers. The consultation also considers the impact on airtightness and on Part F (Ventilation) of the Building Regulations. It includes proposals for revising the Approved Documents for Part L and F to make them easier to navigate and to support efforts to simplify Approved Documents more generally. This includes incorporation of the technical requirements of the Compliance Guides for Parts L and F into the Approved Documents and restructuring the suite of guidance for the energy efficiency of dwellings into a single document (Approved Document L volume 1: dwellings).

	The consultation sets out our proposal to change transitional arrangements to encourage quicker implementation of the new energy efficiency requirements. If builders start work later on some homes in a development, they will need to build to the latest standard rather than continuing to build to the older standard over a long period. Small and medium sized building companies are often working on smaller developments, so they can be affected sooner by changes. The proposed new transitional arrangements may therefore be fairer to small businesses. We appreciate both uplift options increase the costs for home builders and so we propose to remove the ability of local planning authorities to set higher energy efficiency standards than those in the Building Regulations. This has led to disparate energy efficiency standards across the country and can create inefficiencies in supply chains, labour and potentially quality of outcomes. Removing this ability will create certainty and consistency.
Geographical scope:	This consultation relates to Building Regulations for England only.
Impact Assessment:	An Impact Assessment is published alongside this document.

Basic Information

To:	This consultation is primarily aimed at: • Property developers and builders • Property owners and occupiers • Construction industry professionals • Manufacturers and suppliers of construction materials • Environmental organisations. • Local authorities and other building control bodies Specific elements may be of interest to members of the public.
Body/bodies responsible for the consultation:	The Technical Policy Division within the Ministry of Housing, Communities and Local Government (MHCLG).
Duration:	This consultation will last until the revised closing date of 7th February 2020.
Enquiries:	For any enquiries about the consultation please contact FutureHomesStandardConsultation@communities.gov.uk
How to respond:	Responses to the consultation questions should be submitted by online survey: https://www.surveymonkey.co.uk/r/TQW8GQ9 We strongly encourage responses via the online survey, particularly from organisations with access to online facilities

	such as local authorities, representative bodies and businesses. Consultations receive a high-level of interest across many sectors. Using the online survey greatly assists our analysis of the responses, enabling more efficient and effective consideration of the issues raised. Should you be unable to respond through the online survey, responses can be emailed to: FutureHomesStandardConsultation@communities.gov.uk If you are responding in writing, please make it clear which questions you are responding to. Written responses should be sent to: Future Homes Standard Consultation, 2SW, Fry Building, 2 Marsham Street, London, SW1P 4DF When you reply it would be very useful if you confirm whether you are replying as an individual or submitting an official response on behalf of an organisation and include: - your name, - your position (if applicable), - the name of organisation (if applicable), - an address (including post-code), - an email address, and - a contact telephone number

Chapter 1 Introduction

1.1. On the 27 June, the UK became the first major economy in the world to pass a net zero emissions target into law. This target will require the UK to bring all greenhouse gas emissions to net zero by 2050, compared with the previous target of at least 80% reduction from 1990 levels. The UK's 2050 net zero target is one of the most ambitious in the world and was recommended by the Committee on Climate Change (CCC).[1]

1.2. Homes – both new and existing – account for 20% of greenhouse gas emissions in the UK.[2] The UK has already made considerable progress in this sector with the overall total of emissions having reduced by about a fifth since 1990 despite there being approximately a quarter more homes. However, as we set out in the Clean Growth Strategy, more must be done to decarbonise homes to help to meet the 2050 target.[3] By improving energy efficiency and moving to cleaner ways to heat our homes, we can reduce carbon emissions and keep down household energy costs now and in the future. The Clean Growth Strategy also set out our commitment to consult on improving energy efficiency requirements for new homes where the evidence suggests that there are cost-effective and affordable opportunities and it is safe and practical to do so.

1.3. The new homes that we are constructing now and in the next 5 to 10 years are homes that will exist in 2050. We must therefore make sure that the standards we set for these homes put us on the right path. We made a commitment in the 2019 Spring Statement that by 2025 we will introduce a Future Homes Standard for new build homes to be future-proofed with low carbon heating and world-leading levels of energy efficiency.[4] This, along with the Clean Growth Grand Challenge mission to halve energy use in all new builds by 2030,[5] will set a path towards decarbonisation of new homes and support the scaling up of low carbon technologies to decarbonise our existing stock.

1.4. Part L (Conservation of Fuel and Power) and Part 6 of the Building Regulations are the means by which we regulate for minimum energy efficiency standards in new homes. The current requirements mean that new homes are very energy efficient with lower heating bills compared to existing older homes.[6] However, we propose that the standard needs to be uplifted as a stepping stone towards the Future Homes Standard, and in particular towards future-proof homes with low carbon heating.

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[1] Net Zero – The UK's contribution to stopping global warming, Committee on Climate Change (2019) https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/

[2] UK housing: Fit for the future?, Committee on Climate Change (2019) https://www.theccc.org.uk/publication/uk-housing-fit-for-the-future/

[3] Clean Growth Strategy, BEIS (2018) https://www.gov.uk/government/publications/clean-growth-strategy

[4] Spring Statement: Written Ministerial Statement, HM Treasury (2019) https://www.gov.uk/government/publications/spring-statement-2019-written-ministerial-statement

[5] The Grand Challenges, BEIS (2019) https://www.gov.uk/government/publications/industrial-strategy-the-grand-challenges/industrial-strategy-the-grand-challenges

[6] Energy efficiency in the British housing stock: Energy demand and the Homes Energy Efficiency Database, Energy Policy (60), Hamilton, Steadman, Bruhns, Summerfield and Lowe (2013) https://www.sciencedirect.com/science/article/pii/S0301421513002413

1.5. This consultation seeks views on two options to uplift the current Part L energy efficiency standards in 2020 for new homes, on the new Approved Document guidance to support the proposed changes to Part L and on changes to transitional arrangements in 2020. The consultation also considers the wider impacts of Part L for new homes, including changes to Part F (Ventilation), its associated Approved Document guidance, airtightness and improving as-built performance.

1.6. The introduction of an uplift to Part L standards in 2020 would not only improve the energy efficiency of new homes but would also mean that home builders, installers and supply chains will be working to higher specifications in readiness for the introduction for a further uplift in 2025 to meet the Future Homes Standard.

1.7. We will consult in the future on the exact technical detail, guidance and impact assessment for the introduction of the Future Homes Standard in 2025. However, we have included in this consultation our view on what we think the Future Homes Standard may look like and the roadmap to achieving it in order to give context to the proposed changes to Part L to be introduced next year.

The Consultation Package

1.8. The key purpose of this consultation is to seek views on proposed changes to Part L (Conservation of Fuel and Power) of the Building Regulations for new homes and the associated statutory guidance (Approved Document L Volume 1). In particular it seeks to make new homes more energy efficient and to future-proof them for low carbon heating systems. It also includes changes to Part L to align it with the 2018 recast of the Energy Performance of Buildings Directive (EPBD)[7], and proposals for a new approach to transitional arrangements.

1.9. In addition, the consultation considers proposals for improving compliance and performance to ensure that energy efficiency requirements are delivered on the ground.

1.10. The Building Regulations are supported by the National Calculation Methodology, which is used to calculate building energy performance for compliance checking purposes. For homes this is the Standard Assessment Procedure (SAP). Changes are periodically made to these tools to ensure that they remain fit for purpose to support the Building Regulations and other government policies. A consultation version of SAP allows consultees to model the effects of the different uplift options.

1.11. This consultation also sets out our view on what we think the Future Homes Standard may look like and the roadmap for achieving it. This gives the necessary context to the proposed changes to the energy efficiency requirements outlined in the consultation.

[7] Directive (EU) 2018/844 amending Directive 2010/31//EU on the Energy Performance of Buildings, OJEU, 2018. On 27 June, the UK became the first major economy in the world to set a legally binding target to achieve net zero greenhouse gas emissions from across the UK economy by 2050. We will continue to work towards this target post-Brexit.

Package Contents

The Future Homes Standard

1.12. This is set out in Chapter 2 including:

- What the Future Homes Standard should look like: including what levels of reductions in carbon dioxide emissions we anticipate and the types of technical specification that can achieve these reductions
- Implementing the Future Homes Standard: what the issues to be addressed are, in order to ensure the home building industry and supply chains are ready for implementation in 2025, and in particular for the roll out of low carbon heating systems
- Certainty and consistency on the setting of energy efficiency standards: proposals to remove the ability of local planning authorities to set energy efficiency standards above the Building Regulations
- Timeline to the Future Homes Standard: timing of key stages towards the implementation of the Future Homes Standard

Part L

1.13. Proposed changes to Part L and Part 6 of the Building Regulations are set out in Chapter 3, including:

- Changing the whole building minimum energy performance target, which involves:
    i. introducing primary energy as the principal performance metric, and continuing to use a CO_2 as a secondary metric
    ii. removing the fabric energy efficiency metric
    iii. incorporating the latest evidence on primary energy and CO_2 emissions of fuels, and removing fuel factors in the calculation for high-carbon fossil fuels and electricity
    iv. introducing a householder affordability standard for new dwellings, so that new homes are affordable to heat
- taking a significant interim step towards the Future Homes Standard through:
    i. uplifting the minimum standard of whole building energy performance
    ii. improving the minimum insulation standards
    iii. improving the minimum efficiencies of fixed building services.
- future-proofing new dwellings to be ready for low carbon heating systems
- improving compliance with Part L in order to improve as-built performance
- aligning the Part L standards for new dwellings with the 2018 revisions to the Energy Performance of Buildings Directive, where relevant
- adopting the most recent version of the government's Standard Assessment Procedure for Energy Rating of Dwellings Version 10 (SAP10.1)

- simplifying the structure and content of guidance relating to Part L

Part F

1.14. Proposed changes to Part F of the Building Regulations are set out in Chapter 4, including:

- simplifying the approach for determining the ventilation rate and system design requirements for a dwelling
- reviewing the way that ventilation systems are presented in the Approved Document to reflect common design practices
- bringing guidance designed to reduce the ingress of external air pollutants into the main body of the Approved Document, and reviewing its technical content
- making technical changes to guidance for ventilation systems in line with the latest evidence and understanding
- simplifying the structure and content of guidance relating to Part F

Airtightness

1.15. Proposed changes to the airtightness requirements of Part L of the Building Regulations are set out in Chapter 5, including:

- reviewing the approved airtightness testing scheme methodology
- considering whether developers should test all individual homes on a development, and removing the option of sample-testing
- limiting incentives in SAP which encourage very airtight naturally ventilated dwellings
- reflecting the uncertainty of air permeability test results in SAP
- exploring the potential for alternative testing methods or alternative approaches to demonstrating compliance with guidance on airtightness

Improving Compliance and Building Performance

1.16. Proposals for improving compliance, performance and providing information are set out in Chapter 6, including:

- providing guidance to improve build quality and reduce the performance gap
- developing a new style Part L compliance report
- Improving accuracy of as-built energy models by proposing photographic evidence for new dwellings
- educating building occupiers on how to operate low-carbon homes by proposing home user guides for new dwellings

Transitional Arrangements

1.17. Proposed changes to transitional arrangements are set out in Chapter 7, including:

- Proposals to introduce new transitional arrangements to encourage building homes to the latest Part L standards
- Possible transitional arrangements for the 2025 Future Homes Standard

Development of these proposals

1.18. We have worked with industry and other external partners to develop policy when reviewing the building regulations. In winter 2018/19 we established industry working groups, reporting to a Building Regulations Advisory Committee technical working party, to offer views on emerging analysis results and advice on the consultation options.

1.19. The industry working groups of the Building Regulations Advisory Committee (BRAC) have supported our work, including work on domestic energy efficiency standards, ventilation and airtightness standards. We are extremely grateful for the advice and assistance provided by the participants in these groups, and we look forward to working with them to finalise proposals after we have received the consultation responses.

Further Consideration

1.20. This consultation focusses on the Future Homes Standard and a roadmap towards bringing the Standard in 2025, including revisions to the Part L and F standards proposed to be implemented in 2020.

1.21. There are a number of items which relate to the energy efficiency standards but fall outside the scope of this consultation. We intend to consult on the matters discussed in the following paragraphs in the coming months.

Work to existing dwellings

1.22. As set out in the Clean Growth Strategy, we intend to consult on standards when work is carried out in existing dwellings, with a view to uplifting the standards where there are cost-effective, safe and practical opportunities to do so. To reduce the risks associated with energy efficiency works to existing buildings, for example the associated impacts on airtightness which reduce the overall amount of fresh air entering the home, we also propose to introduce new guidance for Part F (Ventilation) to provide clarity on the expected ventilation standard when retrofit work is carried out.

New and existing non-domestic buildings

1.23. We also set out in the Clean Growth Strategy our plans for revising standards for buildings other than dwellings. We intend to consult on making improvements to

Building Regulations requirements for new and existing non-domestic buildings, including opportunities to promote low carbon and higher energy efficiency heating, ventilation and air conditioning systems in new buildings.

The Future of Part L beyond Future Homes Standard

1.24. In further consultation, we plan to explore more options for the future of the building regulations energy efficiency standards, for both homes and commercial buildings, beyond 2025, in the context of the Grand Challenge Buildings Mission. The building regulations have a role to play in supporting the Buildings Mission ambition to halve the energy use of new buildings by 2030.

Overheating in new dwellings

1.25. In 2018 the Environmental Audit Committee (EAC) held an inquiry into heatwaves and their impact on the UK. Within the final report the EAC recommended that the government should create a new regulation to stop buildings being built which are prone to overheating.

1.26. The government responded to this recommendation by committing to consult on a method for reducing overheating risk in new homes.[8] the consultation will address this commitment and include proposals to reduce the risk.

Timetable for introduction of changes

1.27. The dates corresponding to the government's preferred option are set out below.

Date	Government's preferred option on timing
Late 2019/early 2020	Subsequent consultation on: • Overheating in new dwellings • Energy efficiency standards for work carried out in existing dwellings • Energy efficiency standards for new buildings other than dwellings • Energy efficiency standards for work to existing buildings other than dwellings
Early/mid 2020	Publication of new Part L, Part F and overheating regulations, associated guidance and supporting analysed consultation response document.
Mid/late 2020	Part L, Part F and overheating regulations come into force.

[8] Tenth Special Report Appendix: Government Response (2018)
https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/1671/167102.htm

Chapter 2 The Future Homes Standard

Background

2.1. The 2019 Spring Statement included a commitment that, by 2025, we will introduce a Future Homes Standard for new build homes to be future-proofed with low carbon heating and world-leading levels of energy efficiency.[9] This is part of our commitment to clean growth and our determination to be the first generation to leave the environment in a better state than we found it. This chapter sets out how we intend to improve energy efficiency standards in new homes as the roadmap to the Future Homes Standard.

2.2. The Future Homes Standard builds on the Grand Challenge Buildings Mission to at least halve the energy use of new buildings by 2030.[10] As outlined in chapter one, both new and existing homes account for 20% of greenhouse gas emissions in the UK.[11] By making our homes and other buildings more energy efficient and embracing smart and low carbon technologies, we can improve the comfort and energy efficiency of people's homes and boost economic growth while meeting our targets for carbon reduction.

2.3. To meet the Future Homes Standard by 2025, industry will need to develop the necessary supply chains, skills and construction practices to deliver low-carbon heat, and highly energy efficient new homes. The first steps in facilitating these changes are to provide a clear vision for implementing the Future Homes Standard and to set an ambitious uplift to the current energy performance requirements in the Building Regulations for new homes. The existing requirements already require good levels of energy efficiency, but we need to push further. We must ensure that new homes are future-proofed to facilitate the installation of low-carbon heat, avoiding the need to be retrofitted later, and that home builders and supply chains are in a position to build to the Future Homes Standard by 2025. Introducing the Future Homes Standard by 2025 will ensure that the homes this country needs will be fit for the future, better for the environment and affordable for consumers to heat.

2.4. Chapter 3 provides our detailed options for an uplift to the energy efficiency standards in Part L (Conservation of Fuel and Power) and Part 6 of the Building Regulations in

[9] Spring Statement 2019: Written Ministerial Statement (13 March 2019) – see section on Clean Growth on p4 available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785618/WMS_final_Commons.pdf

[10] The Industrial Strategy sets out Grand Challenges to put the UK at the forefront of the industries of the future, including on clean growth and buildings. Details on the Industrial Strategy and the Grand Challenge Missions are at: https://www.gov.uk/government/publications/industrial-strategy-the-grand-challenges/industrial-strategy-the-grand-challenges

[11] Energy use in homes accounts for about 14% of UK emissions, with electricity consumption in homes accounting for 6%. Net Zero: The UK's Contribution to Stopping Global Warming, Committee on Climate Change (2019) https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/

2020. It seeks views on two options to strengthen the energy efficiency standards in 2020. The first option is a 20% improvement[12] on carbon dioxide emissions which we expect would be delivered predominantly through an increased fabric standard. This increased fabric standard would typically be achieved through measures such as triple glazing and a waste water heat recovery system. The second option would result in a 31% improvement[13] on carbon dioxide emissions, which we expect would typically be delivered through a more minor increase to fabric standards, alongside use of low-carbon heating and/or renewables, such as photovoltaic (solar) panels.

2.5. Both options outlined deliver a greater improvement in carbon dioxide emissions than the 19% improvement on the 2013 Part L requirements which was proposed as the minimum on-site energy efficiency requirement of the former Zero Carbon Homes policy.[14] We would expect both the proposed 2020 uplift options to lead to fabric standards that are better than the Fabric Energy Efficiency Standard (FEES) recommended by the Zero Carbon Hub.[15]

2.6. This chapter sets out what we think the Future Homes Standard could look like. In addition, it will also outline the 2020 uplift to Part L energy requirements. Overall this chapter aims to explain the steps necessary to introduce the Future Homes Standard in 2025 while ensuring we meet our commitment to deliver 300,000 homes a year by the mid-2020s.

What should the Future Homes Standard look like?

2.7. The Future Homes Standard will have very high fabric standards. It will mean every new home should typically have triple glazing and standards for walls, floors and roofs that significantly limit any heat loss. We consider the fabric package for the Future Homes Standard should be based on the fabric specification proposed for Option 1 which is set out in Table 4 of the Impact Assessment.

2.8. However, although reducing the demand for heat through improved fabric standards in new homes has an important role to play it will not, on its own, meet our ambitions for the Future Homes Standard or our net zero emissions target by 2050. Therefore, in addition to a high level of fabric efficiency we also propose that a low carbon heating system is integral to the specification of the Future Homes Standard.

2.9. The CCC stated in its report *Net Zero: The UK's contribution to stopping global warming* that achieving the net zero target will require the full decarbonisation of buildings by 2050.[16] There are a number of existing low carbon heating technologies with the potential to support the scale of change needed. We anticipate that low

[12] Based on a semi-detached home. More detail can be found in the accompanying Impact Assessment.
[13] Based on a semi-detached home. More detail can be found in the accompanying Impact Assessment.
[14] Details of the Zero Carbon policy can be found in the Queen's Speech 2014, https://www.gov.uk/government/speeches/queens-speech-2014
[15] Fabric Energy Efficiency Standard, Zero Carbon Hub (accessed on 2019) http://www.zerocarbonhub.org/zero-carbon-policy/fabric-energy-efficiency-standard
[16] *Net Zero: The UK's contribution to stopping global warming* was published by the Committee on Climate Change on 2 May 2019 and is available at: https://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf

carbon heating may be delivered through heat pumps, heat networks and in some circumstance's direct electric heating.

Heat pumps

2.10. We anticipate that the installation of heat pumps, particularly air-to-water and air-to-air heat pumps, will play a major role in delivering low carbon heat for homes built to the Future Homes Standard. Heat pumps come with the same low-carbon benefits as direct electric heating, but can deliver heat much more efficiently, which can help to overcome the affordability and grid-resource constraints associated with direct electric heating.

2.11. However, the installation of heat pumps in the UK is at a level much lower than that necessary to meet the ambition of the Future Homes Standard. The CCC states that there is a need to establish heat pumps as a mass market solution for low carbon heating and there are opportunities to start this with new build properties. The Committee also recommends that 'new homes should not be connected to the gas grid from 2025'.[17] This has informed our thinking on how we should frame the Future Homes Standard.

Heat networks

2.12. Heat networks (sometimes referred to as district heating) are a distribution system that takes heat from a centralised source and delivers it to a number of different buildings.[18] These heat networks also form an important part of our plan in the future of low carbon heat, in particular in cities and high-density areas. Heat networks can decarbonise more easily compared to most other heat sources because new technologies can be added to the system with little disruption to individual householders. They provide a unique opportunity to exploit larger scale, renewable and recovered heat sources that can't be accessed at an individual building level. Heat networks also provide system benefits such as thermal storage and reducing the energy demand of the grid at peak times. It is estimated by the CCC that around 18% of UK heat will need to come from heat networks by 2050 if the UK is to meet its carbon targets cost-effectively.[19] We expect that heat networks will have a strong role to play in delivering low carbon heat to new homes in future.

Direct electric heating

2.13. We anticipate that direct electric heating will play a minor role in our plan for the future of low carbon heat. Direct electric heating is a well-established technology that produces heat through a near-100% efficient process, with no emissions at the point of use. Despite this, direct electric heaters can be very expensive to run, and if deployed at scale may have a significant effect on the national grid. Under some circumstances it may be an appropriate technology in applications where heat

[17] UK housing: Fit for the future? CCC (2019). https://www.theccc.org.uk/publication/uk-housing-fit-for-the-future/

[18] Further guidance on heat networks has been published by BEIS. Heat networks, BEIS (2019) https://www.gov.uk/guidance/heat-networks-overview

demand is particularly low, for instance where a home is built to the very highest fabric standards.

Other technologies

2.14. Other technologies, such as hydrogen, may have a role to play in heating systems of the future. However, for new homes, we anticipate that heat pumps and heat networks (and to a lesser extent direct electric heating) will be the principal means of producing low-carbon heat for buildings built to the Future Homes Standard.

The Future Homes Standard specification

2.15. Before we introduce the Future Homes Standard in 2025, we will consult on the full technical details and the associated impact assessment with costings. However, to provide an indication of our expectation for the Future Homes Standard, we anticipate that an average semi-detached home built to meet the Standard would produce 75-80% less carbon dioxide emissions than one built to the 2013 Part L requirements.

2.16. To achieve this, we would expect the home to have low carbon heating, and higher levels of energy efficiency. This would typically mean that a new home built to the Future Homes Standard would have a heat pump, a waste water heat recovery system, triple glazing and minimum standards for walls, floors and roofs that significantly limit any heat loss.

2.17. However, we will set the Future Homes Standard in performance terms, such as minimum levels of primary energy and CO_2 emissions, limiting fabric standards and building services standards, without prescribing the technologies to be used. This allows housebuilders the flexibility to innovate and select the most practical and cost-effective solutions in particular circumstances.

2.18. As we move towards a decarbonised electricity grid, homes built to the Future Homes Standard will become net zero carbon over time with no need for further adaptations or changes, as they will not be reliant on fossil fuels for their heating.

Q1 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.

Q2 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?

Q3 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.

Implementing the Future Homes Standard

2.19. The Future Homes Standard will be introduced in 2025 and will be implemented through the Building Regulations. This means it will be the national minimum energy performance requirement for all new homes in England when introduced.

2.20. We recognise some home-builders are already building to fabric standards above the current Building Regulations and some are already installing low carbon heating systems, which we encourage. However, not all home-builders are ready to build to higher fabric specifications yet. Furthermore, there may not be the necessary supply chains, trained installers and product availability needed for every home-builder to do so. This is particularly the case with heat pumps, as reported by the CCC:

> *"it is not feasible to ramp up installation rates of heat pumps straight away to the current level of gas boiler sales (over a million per year) from the current level of 20,000 per year, not only due to the lack of market development but also because there are not enough qualified heat pump installers".*[20]

Across government we are working with industry to ensure it has skills needed to rise to this challenge. As part of the Department of Education's National Retraining Scheme, we are investing £34 million to scale up innovative training models for construction skills across the country. This includes the Construction Skills Fund, which supports the development of construction on-site training hubs. We have also been working closely with the Construction Industry Training Board (CITB) to implement a significant programme of reform in order to ensure that CITB is better able to respond to the emerging skills needs of the construction sector, including skills for sustainable construction and for improving energy efficiency.

2.21. The Department of Business, Energy and Industrial Strategy is also engaging with heating installers to understand the existing supply chain's ability to deliver low carbon heat installations. This engagement includes a survey of heating installers which aims to give a voice to installers, plumbers and heating engineers to ensure government understands and listens to the opportunities and risks that face installers in the transition to low carbon heating.[21] The outcomes of this engagement will

[20] Net Zero – The UK's contribution to stopping global warming, CCC (2019) https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/

[21] The heating installer survey ran until 30 September 2019 and can be found on the Chartered Institute of Plumbing and Heating Engineering (CIPHE) website at: https://www.ciphe.org.uk/newsroom/Latest_News/heating-installer-survey/.

determine the crucial roles for government, installers and the wider supply chain in ensuring supply is able to meet demand for heat installation.

2.22. We recognise the challenges of transition to low carbon heating, in particular for the replacement heating sector. However, we agree with the CCC there is an opportunity to start to establish a mass market solution for low carbon heating with new build properties and are using the introduction of the Future Homes Strategy in 2025 to facilitate this.

Certainty and consistency in setting energy efficiency standards

2.23. The Planning and Energy Act 2008 (as amended) allows local planning authorities to set and apply policies in their local plans which require compliance with energy efficiency standards for new homes that exceed the requirements of the Building Regulations.[22] This has been very useful in delivering more energy efficient homes and reducing carbon dioxide emissions in local areas but has also led to there being inconsistent minimum energy standards being applied across the country.

2.24. In 2015, the then government set out in a Written Ministerial Statement its expectation that local planning authorities should not set energy efficiency standards for new homes higher than the energy requirements of Level 4 of the Code for Sustainable Homes (equivalent to a 19% improvement on the Part L 2013 standard). Section 43 of the Deregulation Act 2015[23] would introduce an amendment to the Planning and Energy Act that restricts local authorities from setting energy standards above Building Regulations levels for new homes, but this amendment has not yet been commenced.

2.25. We realise that this may have led to confusion and uncertainty for both local planning authorities and home builders. Many local planning authorities are unclear about what powers they have to set their own energy efficiency standards, although a number of local authorities continue to set their own energy performance standards which go beyond the Building Regulations minimum. While most of these adhere to the 19% level set in the 2015 Written Ministerial Statement, some go further.

2.26. This situation is not only confusing but the application of disparate energy efficiency standards across local authority boundary lines often means that homes need to be built to different technical specifications in different parts of England. This inconsistency creates inefficiencies in supply chains, labour and potentially quality of outcomes. It also means that decisions about the technical appropriateness, application and enforcement of energy standards need to be considered by planning officers, committees and Planning Inspectors rather than by a building inspector.

2.27. As we move to the higher energy standards required by Part L 2020 and the Future Homes Standard, there may be no need for local authorities to seek higher standards and the power in the Planning and Energy Act 2008 may become redundant.

[22] Planning and Energy Act 2008, http://www.legislation.gov.uk/ukpga/2008/21/contents
[23] Deregulation Act 2015, http://www.legislation.gov.uk/ukpga/2015/20/contents/enacted

2.28. The government is therefore exploring options, including whether to commence the amendment to the Planning and Energy Act 2008 which would restrict local planning authorities from setting higher energy efficiency standards for new homes. We will consider whether it is appropriate to do this with the introduction of the uplift to energy standards in Part L in 2020, depending on decisions on that uplift; or to wait until the Future Homes Standard is introduced.

Q4 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 standards for dwellings?

a. In 2020 alongside the introduction of any option to uplift to 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.

Roadmap to the Future Homes Standard

2.29. Figure 2.1 outlines our envisioned timeline towards the implementation of the Future Homes Standard:

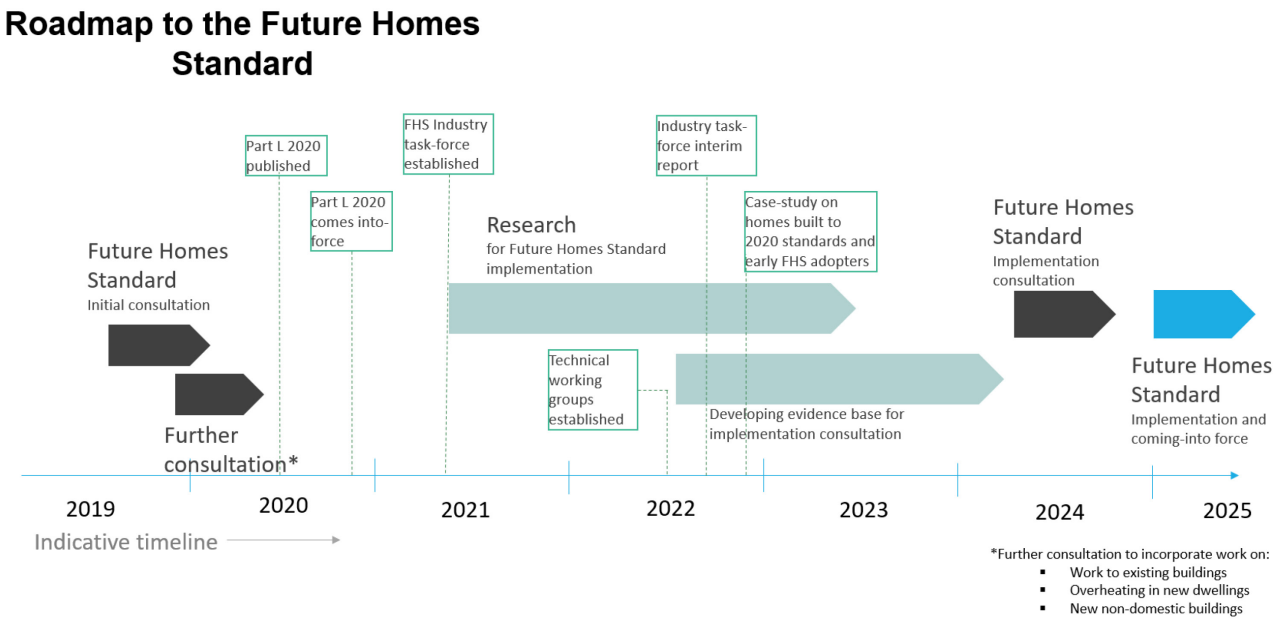

Figure 2.1: Roadmap to the Future Homes Standard

2.30. We are launching this consultation as the initial consultation on the Future Homes Standard, with further consultation on work to existing buildings, overheating in new dwellings and new non-domestic buildings following soon after. We envisage research into the Future Homes Standard to commence from 2021 alongside the establishment of an industry task-force, and research will continue into 2023. From

2022 we will begin to develop an evidence base with the intention of consulting on the implementation of the Future Homes Standard in 2024.

Q5 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.

Chapter 3 **Part L Standards for New Homes in 2020**

Background

3.1. The introduction of the Future Homes Standard in 2025 and installing low carbon heating in new homes requires a very considerable step up in energy efficiency standards compared to the level currently required by Part L of the Building Regulations. We need to get industry in a position where it can deliver in 2025. Therefore, we propose introducing an achievable but meaningful uplift the energy efficiency standards to be brought in as soon as possible as a stepping stone to the Future Homes Standard.

3.2. Our preferred option is to go as far towards the Future Homes Standard as possible in 2020. However, as set out in the previous chapter, we recognise that the transition to low carbon heat requires the market for technologies such as heat pumps to be significantly developed. While it may not be feasible to introduce low carbon heating for all new homes now, we need to make sure that any uplift to energy efficiency standards that we introduce in 2020 means that new homes are future-proofed for low carbon heat, with build standards that minimise heat loss and are affordable to run.

3.3. This chapter focuses on two options for an uplift in energy efficiency standards in Part L to be brought in during 2020. We have sought to find proposals which make a strong and meaningful contribution to reducing the carbon and energy impact of new homes, while recognising that our ambition needs to be balanced against the desire for standards to be cost-effective, affordable and practical.

3.4. In non-technical terms, Option 1 ('Future Homes Fabric') is intended to deliver a 20% improvement on the current Part L standard.[24] We expect this to be delivered predominantly by very high fabric standards, which means lower levels of heat loss from windows, walls, floors and ceilings. Typically, this may include triple glazing. Option 2 ('Fabric plus technology') is intended to deliver a 31% improvement on the current standard. We expect this would typically be delivered through a more minor increase to fabric standards (for example double rather than triple glazing), alongside use of low-carbon heating and/or renewables, such as photovoltaic panels. Details of the costs and benefits of both options are set out below and in the Impact Assessment, but in broad terms Option 2 would deliver more carbon savings and result in lower bills for the householder but has higher build costs. This is our preferred option.

3.5. To note, Part L sets energy efficiency standards by requiring a minimum performance level that must be achieved which is measured in terms of energy and carbon dioxide (CO_2). This is a technical process and as such the sections below are set out in quite

[24] Based on a semi-detached home. More detail can be found in the Impact Assessment.

technical detail. The sections below also refer to homes as 'dwellings' as this is the legal term used in the Building Regulations.

Uplift of the Part L minimum standard

Setting the primary energy and CO_2 targets

3.6. The proposed primary energy and CO_2 targets set the performance level that a new dwelling must achieve; detail on these performance metrics is provided below. We carried out detailed modelling to determine what a reasonable level of energy and CO_2 performance might be for a new dwelling, taking account of carbon savings, running costs, capital costs, and impact on housebuilding.

3.7. Our modelling included considering improvements to the minimum energy efficiency standards in the following areas:

- improving fabric and services
- introducing low-carbon heat
- heat recovery technologies
- on-site generation

3.8. The modelling is described in more detail in the Impact Assessment that accompanies this consultation and the draft Approved Document L.

3.9. Following discussion with our technical working group and assessment of the modelling analysis, two options for the 2020 CO_2 and primary energy targets are proposed for consultation. The options below are presented in terms of CO_2 reduction to aid comparison with current standards. We plan to use either option 1 or option 2 as the basis of the new primary energy and CO_2 targets for new dwellings, with option 2 as the government's preferred option:

a. **Option 1 - 'Future Homes Fabric'.** This would be a 20% reduction[25] in CO_2 from new dwellings, compared to the current standards. This performance standard is based on the energy and carbon performance of a home with:
   i. Very high fabric standards to minimise heat loss from windows, walls, floors and roofs (typically with triple glazing). This would be the same fabric requirement as we currently anticipate for the Future Homes Standard
   ii. A gas boiler
   iii. A waste water heat recovery system

This would add £2557 to the build-cost of a new home and would save households £59 a year on energy bills. The estimated impact on housebuilding is discussed in the impact assessment.

[25] Based on a semi-detached home. As an aggregate across the build-mix, over a 60-year lifespan, this would be an estimated 20% CO_2 saving for option 1, and 30% CO_2 saving for option 2. More detail can be found in the Impact Assessment.

b. **Option 2 -** '**Fabric plus technology'**. This would be a 31% reduction[26] in CO_2 from new dwellings, compared to the current standards. This option is likely to encourage the use of low-carbon heating and/or renewables. The performance standard is based on the energy and carbon performance of a home with:
   i. an increase in fabric standards (but not as high an increase as in Option 1, likely to have double rather than triple glazing)
   ii. a gas boiler
   iii. a waste water heat recovery system.
   iv. Photovoltaic panels

Meeting the same specification would add £4847 to the build-cost of a new home and would save households £257 a year on energy bills. The estimated impact on housebuilding is discussed in the impact assessment.

3.10. The option 2 specification would give a CO_2 saving of only 22% for flats due to the standard including solar panels and flats having a smaller roof area per home. The additional cost per flat is also less at £2256.

3.11. In practice, we expect that some developers would choose less costly ways of meeting the option 2 standard, such as putting in low-carbon heating now. This would cost less than the full specification, at £3134 for a semi-detached house.

3.12. We propose that the targets will be performance-based. The specifications on which both of the options above are based represent one way of meeting the primary energy and CO_2 targets for each of the options; we expect developers will find a wide variety of ways to meet these targets, utilising many different technologies.

Q6 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.

Performance metrics

3.13. We propose four performance metrics for buildings to be measured against. These are:

- Primary energy target
- CO_2 emission target
- Householder affordability rating

[26] Based on a semi-detached home. As an aggregate across the build-mix, over a 60-year lifespan, this would be an estimated 30% CO_2 saving for option 2. More detail can be found in the Impact Assessment.

- Minimum standards for fabric and fixed building services

This is a change from the current performance metrics of:

- CO_2 emission target
- Fabric energy efficiency target
- Minimum standards for fabric and fixed building services

The rationale for each of these is described below.

Setting the energy target for new dwellings using primary energy and CO_2 metrics

3.14. The 2013 Part L standard sets performance targets for new dwellings based on the CO_2 emissions of that dwelling. CO_2 is important, but it is not a direct measure of energy efficiency.

3.15. Over time, the electricity grid will become zero carbon, and we have made considerable progress in reducing the carbon intensity of the electricity grid already. Where a new dwelling uses electricity, CO_2 will become a less important measure of performance because it will ultimately come from an electricity grid that is zero carbon.

3.16. We are proposing that, from 2020 the energy efficiency of new dwellings should be assessed as the basis for the Part L performance target. Primary energy is the means we are proposing as a measure of energy efficiency. More information on our proposals for primary energy, including an explanation of what primary energy is and how it is calculated, can be found in the *Briefing Note – Derivation and use of Primary Energy factors in SAP*, which will be available on the SAP website: https://www.bregroup.com/sap/sap10/.

3.17. Despite the new focus on primary energy, reducing CO_2 emissions of new homes and buildings remains a critical objective for government. Although we consider primary energy to be a good means of driving energy efficiency, it may not drive low carbon choices in all scenarios by itself. For this reason, we propose to continue to use CO_2 targets for buildings alongside a primary energy target. The consultation version of SAP10 shows how we propose to apply primary energy to the compliance calculations in future.

Q7 Do you agree with using primary energy as the principal performance metric?

a. **Yes – primary energy should be the principal performance metric**
b. **No – CO2 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.

Q8 Do you agree with using CO2 as the secondary performance metric?

a. **Yes**
b. **No**

Please explain your reasoning.

Ensuring heating is affordable for householders

3.18. Electricity now has a lower CO_2 emission factor than natural gas. While electricity continues to have a higher primary energy than gas, it could be an appealing low capital cost option for developers to install direct electric heating solutions to meet primary energy and CO_2 targets. Direct electric heating installed in new homes could incur over £350 higher bills per year for occupants when compared to gas heating, unless we change the Part L standards to make sure that new homes do not result in high energy bills.

3.19. To address this issue, and to reduce the risk that energy bills are unaffordable for consumers, we are proposing to introduce a new requirement for new dwellings in addition to primary energy and CO_2, based on the theoretical energy cost of the dwelling. This is referred to in the draft Approved Document L as the Householder Affordability Rating.

3.20. This would ensure that, where direct electric heating is installed, the theoretical energy bills would be reasonable. This could be achieved, for example, through any combination of the following:

- Increased fabric efficiency
- Heat recovery devices
- Renewable generation
- On-site energy storage

As part of producing an Energy Performance Certificate, an energy cost calculation is carried out based on the combined costs of heating, lighting and hot water. This is the Energy Efficiency Rating. A possible test for affordability would be to use the Energy Efficiency Rating as a measure, and to set a minimum Energy Efficiency Rating that must be achieved. As the Energy Efficiency Rating includes the theoretical costs of heating and hot water for the dwelling, higher cost heating approaches (compared to gas heating) can have a large effect on the rating.

Q9 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.

Q10 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 no, please suggest an alternative metric, explain your reason and provide evidence to support this.

Minimum fabric standards and the removal of Fabric Energy Efficiency Standard

3.21. In the 2013 revision of Part L, we introduced the fabric energy efficiency standard to reflect that providing well insulating fabric is an essential component of energy performance. We still consider the principle of a fabric-first approach to be sound, and that the Part L 2020 standards should encourage fabric performance.

3.22. However, there are concerns that continuing to use the fabric energy efficiency standard, while introducing new metrics in the form of primary energy and a householder affordability rating will result in a set of standards which are complex and difficult to understand. We are proposing to remove the fabric energy efficiency standard as a performance metric, and to use other means of making sure that building fabric is efficient.

3.23. We propose to encourage good fabric by retaining and improving the minimum standards for individual fabric elements (walls, roofs, floors, windows etc).

3.24. Without strong minimum elemental fabric standards, designers could use one single, highly-efficient, fabric element with much poorer fabric performance elsewhere, or low carbon technology to achieve regulatory targets.

3.25. The fabric energy efficiency standard is a regulatory standard underpinned by Regulations 26A and 27A. If the fabric energy efficiency standard is discontinued these regulations would need to be revoked, which would leave the functional requirement of Part L of Schedule 1 to the Building Regulations as the requirement against which building control bodies would check fabric performance. A suggestion from our working group was that minimum fabric efficiency values should become regulatory minima through a new regulation, if the fabric energy efficiency standard is discontinued.

3.26. We propose to improve the minimum standards for fabric in the guidance. Our proposed uplifts to the minimum standards can be found in the draft Approved Document L and below. These are based on a statistical analysis of data used to produce the EPCs of all new homes built to 2013 Part L standards. The proposed minimum standards would remove the worst performing 25% of each thermal element being currently built.

3.27. The proposed minimum elemental standards for new dwellings are as follows:

Table 3.1 - Minimum standards for fabric performance	
External walls	0.26 W/m^2.K
Party walls	0.20 W/m^2.K
Floor	0.18 W/m^2.K
Roof	0.16 W/m^2.K
Windows	1.6 W/m^2.K
Roof-lights[1]	2.2 W/m^2.K
Door	1.6 W/m^2.K
Air permeability	8m^3/m^2.K at 50Pa

[1] The U-value of upstands and builders' kerbs is subject to the limiting U-value for external walls.

3.28. We propose that the limiting U-value for roof-lights should be based on a roof-light in a horizontal position, rather than the vertical. Most roof-lights are tested and installed in the horizontal position. This proposed change reduces the need for conversion factors, which add unnecessary complexity.

3.29. We propose to adopt the new version of BR 443, which gives guidance on conventions for U-value calculations. In general, BR 443 (2019) is an update to the 2006 edition, primarily reflecting changes in British, European and International standards; industry practice; and industry publications. The main changes are listed in Annex B to this document, however the new BR 443 should be reviewed in full for other minor changes. The latest version is available for this consultation at: https://www.bregroup.com/sap/sap10/.

Q11 Do you agree with the proposed minimum fabric standards set out 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.

Q12 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.

Q13 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.

Q14 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.

Q15 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.

Removing the fuel factors - phasing out high-carbon fossil fuels

3.30. In the government's Clean Growth Strategy (2017) we set out our intention to phase out high-carbon fossil fuels in the 2020s, starting with new buildings.

3.31. The 2013 version of Approved Document L1A includes a table of 'fuel factors'. The purpose of the fuel factors, which were introduced in 2006, was to provide some relief for those using more carbon intensive fuels either because gas is not available or because (for example) electrically driven heating, such as heat pumps is preferred.

3.32. Grid electricity now has a lower carbon emission factor than gas. It therefore no longer needs a fuel factor to support its use. We propose to remove the fuel factor for grid electricity.

3.33. For other fuels (e.g. liquid petroleum gas (LPG), oil, solid mineral fuel heating) we consider that fuel factors should no longer be applied. This supports our intention to phase out high-carbon fossil fuels.

3.34. We propose to remove fuel factors, so that any new building will need to meet primary energy and CO_2 emissions equivalent to that of one of the options presented in the Impact Assessment and cSAP. Although this is not an outright ban on LPG, oil and solid mineral fuels being used in new buildings, these fuels are all more carbon intensive fuels than gas. This means that if oil, LPG or solid mineral fuel are to be used in new buildings, considerable mitigating measures would need to be installed to reach parity with a new gas-heated building.

Q16 Do you agree with the proposal of removing fuel factors to aid the transition from high-carbon fossil fuels?

a. **Yes**
b. **No**

If no, please explain your reasoning.

Building services - minimum efficiencies and controls

3.35. Part L 2013 sets minimum standards for the efficiency and controls for building services (such as heating, lighting and hot water). These are currently detailed in the Domestic Building Services Compliance Guide.

3.36. We propose that minimum standards for building services should be set in the Approved Documents, and that the guidance for building services should be simplified. The Guidance section of this consultation sets out the proposal to restructure the Approved Document in more detail. We also propose uplifting the minimum building services standards where any of the following apply:

- Evidence suggests that specifying higher performance or controls for certain technologies has become cost-effective
- Evidence suggests that the minimum standards are below that of typical practice
- Other regulatory requirements apply which increase the minimum standard (for example, Ecodesign requirements)

3.37. In response to these criteria, we propose uplifting the minimum standards for building services efficiencies and controls. This includes an uplift in the minimum efficiency of heat pumps, comfort cooling, ventilation systems, and lighting.

3.38. Table 3.2 outlines the proposed changes in minimum standards for the following applications for new dwellings.

Table 3.2: Proposed revisions to minimum building services efficiencies and controls for new dwellings

Application	**Current Part L 2013 standard**	**Proposed Part L 2020 standard**	**Comments**
Gas boiler efficiency	88% SEDBUK 2009	92% ErP	Consistent with Boiler Plus measures for existing dwellings
Heat pump efficiency	SCOP 'D' if ≤12kW COP 2.5	SCOP 2.80	Consistent with Ecodesign standard
Comfort cooling efficiency	EER 2.4 (air cooled) EER 2.5 (water cooled)	SEER 3.87	Consistent with Ecodesign standard
Lighting	45 lamp lumens per circuit-watt	60 lamp lumens per circuit-watt	Uplift to reflect common practice

Q17 Do you agree with the proposed changes to minimum building services efficiencies and controls set out in table 3.2?

a. **Yes**
b. **No**

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

Future-proofing

3.39. In the Clean Growth Strategy, the government committed to consulting on introducing measures for new homes which would make it easier to install low carbon heating in future. This could include making space for hot water storage, installing suitable emitters, improving the building fabric or installing low-carbon heat sooner.[27]

3.40. Because of the diverse possibilities for low carbon heat in future, we cannot futureproof for every scenario. However, one proposal which would provide benefits now, and make it easier to install heat pumps or district heating in future, is for new buildings to have a space heating system which operates at a low temperature. Heat pumps operate best at temperatures of 55°C or lower. This flow temperature would also have benefits of increasing the efficiency of condensing boilers, giving an immediate energy saving to the consumer. It would also reduce losses and improve system efficiencies in district heating and facilitate the transition to low carbon technologies.

3.41. We propose that wet space heating systems should be designed to operate with a flowrate temperature of 55°C or lower in the final heating circuit. To encourage this, we could either:

- design the notional building in the Standard Assessment Procedure with the assumption that its heating system operates at 55°C.
- set a minimum standard that heating systems should be designed to operate at temperatures of 55°C or lower

3.42. The proposal for low-temperature heat would likely result in larger heat emitters (e.g. radiators). The proposal aims to provide low cost and low disruption to householders when low-carbon heat is installed in the future, because they will not need to have new radiators installed.

[27] These four policy options were all considered after a BEIS call for evidence on phasing out fossil fuels on the off-gas grid, which covered future-proofing. The call for evidence, as well as the government's response, can be accessed here: https://www.gov.uk/government/consultations/a-future-framework-for-heat-in-buildings-call-for-evidence

Q18 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.

Q19 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.

Consideration of high-efficiency alternative systems

3.43. Regulation 25A of the Building Regulations deals with high-efficiency alternative systems. It requires the person who is to carry out the work to analyse and consider the technical, environmental and economic feasibility of using high-efficiency alternative systems in the construction. We propose to simplify these requirements by both:

- removing the list of example systems at 1(a)-(d) of Regulation 25A
- removing the requirement to give notice to the local authority that states the analysis has been carried out.

3.44. These proposed amendments do not change the need for the analysis of high-efficiency alternative systems to be undertaken, nor does it prevent Local Authorities from requiring evidence of such an analysis having been carried out.

Q20 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.

Calculating the primary energy rate and emission rate

Changes to the Standard Assessment Procedure

3.45. The Standard Assessment Procedure (SAP) is the methodology used by the government to assess and compare the energy and environmental performance of dwellings, and is used to determine compliance with the energy efficiency

requirements of Part L. The government's Standard Assessment Procedure for Energy Rating of Dwellings will continue to be used to calculate compliance metrics for Part L; proposed in this consultation to be the primary energy rate and the emission rate. A consultation version of the Standard Assessment Procedure 10.1, cSAP, is available at this web page: https://www.isap.org.uk/.

3.46. The government consulted on SAP 2016, now named SAP 10, in 2016.[28] The government responded to this consultation[29] in 2017 and published SAP 10 in 2018.

3.47. We have made minor changes to SAP 10 to create SAP 10.1. The changes not previously consulted on:

- A minimum recognised level of airtightness in naturally ventilated buildings has been introduced (AP_{50} = 3m^3/m^2.h). Lower values may be entered, but further energy savings will not accrue below this level. This is outlined further in chapter five and is consulted on separately there.
- Provision has been added to allow the standing losses for heat interface units (for use with heat networks) to be taken from Product Characteristics Database (PCDB). Where no PCDB data is available a default of 1.46 kWh/day will be used.
- The in-use factor of 1.15 for heat networks has been removed from specification and instead will be part of the PCDB record, allowing it to be varied depending on the nature of the source of the data.
- A procedure for modelling solar thermal heating systems implementing EN15316-4-3:2017 has been added.
- The minimum recognised rate for showers has been set to 8l/min for new homes, or 7l/min for existing homes.
- A requirement and method to include 'significant' point thermal bridges has been added to meet a requirement of EN52016-1:2017.
- The treatment of electricity generated by PV where not connected directly to the dwelling's meter has reverted to being as in SAP 2012.
- The table of reference building characteristics used for setting regulatory targets has been updated. The key changes are to the fabric values and to the building services, which are considered in more detail in this chapter. Please consult Appendix R of SAP 10.1 for the full updated list of reference values.

3.48. At implementation of the new Part L standard we will publish version 10.2 of the Standard Assessment Procedure, to take account of any changes from the outcome of this consultation. Within this we plan to change the source of most fuel prices used in SAP from Sutherland Tables data to BEIS's 'Domestic energy price indices'[30]. This data has been assessed by government to be more robust than Sutherland Chart data for some fuel prices, therefore where BEIS collates price information, this should

[28] https://www.bre.co.uk/sap2016/page.jsp?id=3619
[29] https://www.gov.uk/government/consultations/public-consultation-on-proposals-to-amend-the-standard-assessment-procedure-sap
[30] https://www.gov.uk/government/statistical-data-sets/monthly-domestic-energy-price-stastics

be used to better inform SAP and RdSAP. Figures not available from the BEIS source will continue to be taken from the current source.

Q21 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.

Q22 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.

Approach to calculating Primary Energy and CO_2

3.49. As outlined earlier in this chapter, we propose that primary energy should form one of four performance metrics that buildings are measured against.

3.50. The Standard Assessment Procedure uses factors to convert modelled energy use into primary energy and CO_2. *Briefing Note – Derivation and use of Primary Energy factors in SAP* (available at: https://www.bregroup.com/sap/sap10/) sets out our proposed method for calculating primary energy, CO_2 and emissions factors. The calculated primary energy and CO_2 emissions factors to be used with the 2020 version of Part L can be found in the consultation version of SAP (cSAP) and in the accompanying Impact Assessment.

3.51. In summary, we are using the same general approach towards calculating primary energy and CO2 factors as in the 2013 version of Part L. Our treatment of onsite and offsite renewable electricity is also the same as in Part L 2013, with renewable electricity produced onsite accounted for by deducting the electricity produced by renewables from the electricity demand for the building. For district heating systems with renewable components, any renewable energy in the system will not count towards the primary energy of these systems, with the overall primary energy factor of a district heating system dependent on the mix of renewables and fossil fuels within it.

3.52. We have also updated fuel prices, CO2 and primary energy factors to reflect the latest data and the decarbonising grid. We have moved from a three-year to a five-year average of predicted values.

3.53. New tables have also been added to allow for the monthly variation of electricity, CO2 and primary energy factors. These are detailed in Appendix C of the accompanying Impact Assessment.

Q23 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.

Removal of Government's Approved Construction Details

3.54. Government previously developed and published a series of detailed drawings to help home builders minimise heat loss at joints, junctions and corners (known as 'thermal bridging') and to help achieve performance standards in earlier versions of Part L. However, these drawings, known as Approved Construction Details, have become out of date. We are proposing to remove the option of adopting government's Approved Construction Details, because these will no longer work with new fabric specifications required to meet the new standards detailed in this chapter. Alternative methods of assessing thermal bridging are in the Approved Document under *Continuity of Insulation*.

Q24 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.

New technology factors for community heating schemes

3.55. As outlined in Chapter two, district heat networks comprise an important part of our energy future in England. Significant investment has been made into heat networks in England, and where there is potential for decarbonising, we consider that new connections to existing heat networks can be appropriate, and part of our transition to low carbon heating. We need to maximise the benefits of continuing use of existing heat networks, while also incentivising new networks to be lower carbon.

3.56. In order to encourage heat networks, we propose that weighting, which we refer to as 'technology factors', is applied into calculations for the target emission rate and target primary energy for new dwellings where the design incorporates heat networks. Applying these technology factors is intended to encourage heat networks; this is in recognition of the ability of heat networks to decarbonise over time.

3.57. The draft Approved Document supplied alongside this consultation provides detail of the proposed technology factors for heat networks.

Q25 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 an advantage to heat networks**
d. **No – I disagree for another reason**

Please explain your reasoning.

Guidance

3.58. Dame Judith Hackitt's final report on the Independent Review of Building Regulations and Fire Safety[31] includes in Appendix F recommendations for ways in which the Approved Documents could be improved. The government's response to the Review – *Building a Safer Future: An Implementation Plan*[32] – published on 19 December 2018 sets out plans for producing clearer standards and guidance, including the following commitment:

> *The government will ensure that guidance is as clear as possible and tailored to the needs of people who need to use it.*

This review of Parts L and F presents an opportunity to consider who the intended audience is for the Approved Documents and Compliance Guides, and how the readership can most usefully interact with this guidance.

3.59. We have presented a restructured guidance for Parts L and F alongside this consultation, in line with this recommendation. The new guidance aims to be clearer about what is expected of home builders and developers in complying with the regulatory requirements, while the following supplementary information has been removed:

- guidance on Energy Performance Certificates;
- advice on including adequate levels of daylight;
- note that future temperatures may want to be considered;
- detailed notes regarding the Standard Assessment Procedure;
- advice on facilitating incorporation of improvements in system efficiencies;
- guidance on what might be 'useful' to include in a commissioning plan;
- suggestion that until the building control body receives the commissioning notice, it may not consider it appropriate to give a completion/ final certificate. While this is correct it is unnecessary information to include in an approved document;
- guidance for the minimum efficiencies and controls for building services unlikely to be installed in new dwellings, including in particular oil-fired boilers and solid mineral fuel appliances, among others.

[31] https://www.gov.uk/government/publications/independent-review-of-building-regulations-and-fire-safety-final-report
[32] https://www.gov.uk/government/publications/building-a-safer-future-an-implementation-plan

Q26 Do you agree with removing this 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.

Q27 Do you agree with the external references used in the draft Approved Document L, in Appendix C and Appendix D?

a. **Yes**
b. **No**

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

Restructuring the statutory guidance

3.60. Statutory guidance for Part L is currently given in the following documents:

- Approved Document L1A *Conservation of fuel and power in new dwellings*
- Approved Document L1B *Conservation of fuel and power in existing dwellings*
- Approved Document L2A *Conservation of fuel and power in new buildings other than dwellings*
- Approved Document L2B *Conservation of fuel and power in existing buildings other than dwellings*

3.61. The Approved Documents are supported by the following MHCLG publications, which, in practice, are seen to form an extension to the Approved Documents:

- *Domestic Building Services Compliance Guide*
- *Non-Domestic Building Services Compliance Guide*
- *Guide to the condensing boiler installation assessment procedure for dwellings*

3.62. The structure of the guidance associated with Part L is inconsistent with other Approved Documents, most of which have been split between dwellings and non-dwellings. Each of the Building Regulations functional requirements could be provided with Approved Documents in two volumes as follows: *volume 1* to provide guidance for dwellings, and *volume 2* to provide guidance for buildings other than dwellings. The guidance would therefore be as follows:

- *Approved Document L: volume 1 – dwellings*
- *Approved Document L: volume 2 – buildings other than dwellings*

3.63. The Compliance Guides – namely the Domestic Building Services Compliance Guide[33] and the Domestic Ventilation Compliance Guide[34] – were introduced at a time when the industry was undergoing rapid change to implement new energy efficiency standards, and the documents have served an important purpose in providing additional guidance to the Approved Documents. The Guides themselves comprise a mixture of good practice guidance, minimum standards, and references to regulations other than the Building Regulations. However, we have received feedback that the status of the Compliance Guides is unclear to stakeholders – particularly which parts are regulatory, and which are guidance. There is a case for making this clearer, by restructuring the guidance associated with Parts L and F.

3.64. We propose to take all of the minimum standards from the Compliance Guides and incorporate them into the Approved Documents. To match the style of the Approved Documents, it would mean removing all 'good practice' guidance, supplementary information, and guidance relating to non-Building Regulations matters. We recognise that this means government is providing less guidance for industry on best practice, and system-specific guidance. This is an opportunity for industry, who are better placed to provide best practice and sector-specific guidance, to provide their own guides to supplement the Building Regulations minimum guidance.

3.65. We have also simplified the guidance on building services in a number of ways, including:

- Setting the structure to avoid repetition, and include common guidance which relates to different fuel types
- Simplifying the tables and figures
- Simplifying the pipework heat loss criteria to make this easier for designers to understand, and for building control bodies to check

Q28 Do you agree with incorporating the Compliance Guides into the Approved Documents?

a. Yes
b. No

If no, please explain your reasoning.

Q29 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

33 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/697525/DBSCG_secure.pdf

34 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/456656/domestic_ventilation_compliance_guide_2010.pdf

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

Q30 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.

3.66. Collating all guidance for dwellings into a single document makes it necessary for us to restructure within the Approved Documents themselves. This is an opportunity to review the way in which these Approved Documents work. ADL1A and ADL2A are currently not structured in line with the regulatory requirements, and in the main refer to the Building Regulations *energy efficiency standards* rather than individual regulations. Compliance with the regulations is currently presented as a number of Criteria, as follows:

- Criterion 1: Achieving the Target Emission Rate and Target Fabric Energy Efficiency
- Criterion 2: Limits on design flexibility
- Criterion 3: Limiting the effects of heat gains in summer
- Criterion 4: Building performance consistent with Dwelling Emission Rate and Dwelling Fabric Energy Efficiency
- Criterion 5: Provisions for energy-efficient operation of the dwelling.

The new structure is presented in Section 0: Introduction of the consultation draft of *Approved Document L: volume 1 – dwellings.*

3.67. Introducing a new overheating standard (as outlined in the introduction) may result in *Criterion 3* being relevant to a different part of the Building Regulations. Continuing to use the 'criteria' as a way to describe the Part L guidance is not consistent with the principles of providing clear guidance which matches closely with the legislative requirements. The restructured draft Approved Document, with sections corresponding with each legislative requirement, is provided alongside this consultation.

Q31 Do you agree with all of the proposals for restructuring the Approved Document guidance?

a. **Yes**
b. **No**

If no, please explain your reasoning.

Transition and Implementation

3.68. Proposed transitional arrangements for the Part L changes in 2020 are outlined in chapter seven of this consultation, alongside the transitional arrangements for the 2025 Future Homes Standard.

Energy Performance of Buildings Directive

3.69. Part L of the Building Regulations forms part of an ambitious domestic energy efficiency agenda and is used to set minimum energy performance standards for buildings to drive reductions in emissions. It was in place before the EU introduced the recast Energy Performance of Buildings Directive[35] in 2010, which was informed by policies the UK were already doing, and so Part L has been used to transpose relevant parts of the Directive. The EPBD has recently been amended[36]. Subject to the terms of the EU exit withdrawal agreement and implementation period, Part L may be used to transpose relevant requirements of the revised EPBD. We have set out proposals in this consultation to align with the latest changes to the requirements in the Directive for new dwellings, in the following areas:

- Primary energy (see performance metrics section of this consultation).
- Self-regulating devices (see below)
- Building automation and control systems

3.70. The EPBD requires all new buildings to be 'nearly zero-energy buildings' by January 2021.[37] The UK already exceeds EU minimums in a number of areas, and we will continue to lead the way on these important issues in the future. We consider that both of the uplift options presented in Chapter 3 meet the definition for nearly zero-energy buildings and meet the 'cost optimal' definition.

Self-regulating devices

3.71. We plan to introduce a new regulation in the Building Regulations 2010 to ensure that new homes must have self-regulating devices. Technically this means including devices for the separate regulation of the temperature in each room or designated heating zone (where this is justified) of the building. A common way of achieving this in practice for new homes would be having thermostatic radiator valves (TRVs) on radiators in each room, which are often already installed as standard practice. Further details are provided in the Impact Assessment.

3.72. Suggested guidance for new dwellings is provided in the draft Approved Document L volume 1.

Q32 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.

[35] DIRECTIVE 2010/31/EU of the European Parliament and of the Council of 19 May 2010: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32010L0031&from=EN

[36] EPBD DIRECTIVE (EU) 2018/844 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018 amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency.

[37] https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-performance-of-buildings/nearly-zero-energy-buildings.

Q33 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.

Information about Building Automation and Control Systems

3.73. A building automation and control system is a term used for a centralised system installed to monitor and control a building's environment and services i.e. its heating, ventilation, air conditioning, lighting and other systems (such as security alarms and lifts). Such systems would typically be installed in large commercial buildings but not usually in dwellings. However, it is possible that a building automation and control system could be installed in a large apartment block. If building automation and control systems are installed in new dwellings, we propose that information about the energy performance of the building automation and control system must be provided to the building owner. This requirement aligns Part L with the EPBD.

3.74. Guidance on providing information about building automation and control systems for new dwellings is provided in the draft Approved Document L volume 1.

Q34 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.

Chapter 4 **Part F Changes**

Background

4.1. Ventilation is the supply and removal of air to and from a space or spaces in a building, whether through natural or mechanical means. Adequate ventilation in homes is important for good air quality.

4.2. To investigate whether the ventilation provisions for good indoor air quality set out in Part F 2010 were effective, MHCLG commissioned research into ventilation and indoor air quality in new homes, and the full research report is published alongside this consultation. The research suggested that a large proportion of homes may be failing to meet the technical standards set out in Approved Document F. This led to poor indoor air quality in several of the sample of houses tested. The research also identified some issues where people shut trickle ventilators or turned off extract fans to reduce noise.

4.3. Research produced by the Mackintosh Environmental Architecture Research Unit,[38] the Zero Carbon Hub[39] and MHCLG identified similar issues with new homes not meeting the standards set out in Approved Document F.

4.4. When Part F was last consulted on, several revisions were made to improve the as-built performance of ventilation systems in new homes, these included:

a. Introducing a new regulation that ventilation systems must be installed and commissioned in accordance with a procedure approved by the Secretary of State.
b. Introducing a new regulation that air flow rates for mechanical systems should be measured in all new dwellings.

It is our view that these revisions are still sound in principle, but there are further enhancements we can make in this review to improve the performance and application of Part F in practice.

4.5. The draft Approved Document integrates Appendix D from Part F 2010 into the main body of the statutory guidance. This editorial change clarifies the status of this part of the guidance as an essential part of the performance-based guidance.

4.6. The proposed changes to the Approved Document include simplifying guidance for natural ventilation systems and for mechanically ventilated systems as per Table 4.1.

[38] Sharpe, McGill, Gupta, Gregg, Mawditt (2016) *Characteristics and Performance of MVHR systems.* MEARU, fourwalls, Oxford Brookes University
[39] Nicholls, Dollard, Mawditt, Pannell (2016) *Ventilation in New Homes* . London: Zero Carbon Hub http://www.zerocarbonhub.org/sites/default/files/resources/reports/ZCH_Ventilation.pdf

Table 4.1: Proposed Changes to the Approved Document F	
System Type	**Dwellings covered by proposed guidance changes**
Natural ventilation (formerly System 1)	Less-airtight
Continuous mechanical extract ventilation (formerly System 3)	Highly-airtight
Continuous mechanical supply and extract ventilation (formerly System 4)	Any level of airtightness

4.7. It is the government's view that for scenarios outside the scope of Table 4.1, suitable expert advice should be sought in order to ensure new homes provide healthy indoor environments whilst delivering lower carbon emissions.

Performance based ventilation standards

4.8. We have assessed the underlying assumptions on ventilation rates based on the latest available evidence. The technical work, undertaken as part of the review, suggests that these assumptions are sufficiently robust. Our conclusions from this work are that the performance-based ventilation approach presented in Appendix B of the draft Approved Document is an appropriate basis for determining ventilation rates.

4.9. There is limited evidence on the ventilation rates required to meet individual levels of volatile organic compounds, although we recognise that an assessment of individual volatile organic compounds could be a better means of determining appropriate control of indoor air pollutants. Latest scientific evidence from Public Health England (PHE) proposes a list of pollutants for consideration when designing healthy indoor environments[40].

4.10. We are considering whether designers should have the option to assess ventilation strategies against individual volatile organic compounds informed by empirical evidence from PHE, as an alternative to using total volatile organic compound; we have incorporated that option into the draft Approved Document.

Q35 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.

40 PHE. (2019). IAQ guidelines for selected volatile organic compounds in the UK. https://doi.org/10.1016/j.buildenv.2019.106382
https://www.gov.uk/government/publications/air-quality-uk-guidelines-for-volatile-organic-compounds-in-indoor-spaces

Q36 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.

Minimising the ingress of external pollutants

4.11. The draft Approved Document F provides guidance in section 2 on minimising the ingress of external pollutants. This clarifies the existing guidance in the Approved Document. The new guidance states that particular attention should be given to the guidance for minimising the ingress of external pollution in locations where the Air Quality Standards Regulations 2010 Schedule 2 limit values are exceeded.

Q37 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.

Noise

4.12. We have considered the issue of noise from mechanical ventilation systems. We do not consider that simple product-testing or type-testing is an appropriate mechanism for controlling noise from mechanical ventilation systems, as the noise in-situ is highly dependent on the quality and nature of the installation as much as the products within it. We have not proposed mandatory in-situ noise testing as part of this review, although it is something that government could consider in future (for example, as part of a future Part E consultation). We have, however, clarified the draft Approved Document to make it clear that ventilation installations should not be unduly noisy, and provided some simple guidance.

Q38 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.

Ventilation Solutions for Dwellings

4.13. Part F currently provides guidance for the following ventilation solutions:

- System 1 – Background ventilators and intermittent extract fans
- System 2 – Passive stack ventilation (PSV)
- System 3 – Continuous mechanical extract ventilation (MEV)
- System 4 – Continuous mechanical supply and extract with heat recovery (MVHR)

This section considers:

- Should System 2 still warrant specific guidance in AD F?
- A redrafting of the Approved Document for Part F

Passive Stack Ventilation

4.14. We have considered whether passive stack ventilation is installed sufficiently often by non-specialist designers and installers to warrant detailed guidance in the Approved Document. Our understanding is that, while passive stack ventilation can be an appropriate system for use in new dwellings, it remains a specialist system. Recently published research estimates that the market share of PSV in new homes is estimated to be <1%.[41]

4.15. Because passive stack ventilation is typically installed by specialists carrying out full design, and it is installed in a very small number of new build properties, we proposed that guidance on PSV is no longer included in Approved Document F.

Q39 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.

[41] Crawley, J., Wingfield, J., & Elwell, C. (2019). The relationship between airtightness and ventilation in new UK dwellings. Building Services Engineering Research and Technology, 40(3), 274–289.

Developing simplified ventilation standards

4.16. Approved Document F 2010 recommends two sets of minimum standards for a dwelling's ventilation provision depending on the design air permeability as follows:

- *Default approach*: Intended to work at any level of airtightness.
- *Alternative approach*: Intended only for less airtight dwellings.

4.17. The impact of this approach is that Approved Document F includes two sets of guidance for each ventilation system – one for each of these ventilation standards. This introduces complexity both for the designer in determining the appropriate standard and ventilation provisions and for the building control body to assess compliance at completion. Given the general improvements in air permeability for new homes, and the intention to simplify the guidance, there is a question as to whether setting multiple ventilation standards is still justified.

4.18. For natural ventilation systems (formerly referred to as *System 1*), it is proposed to only provide guidance for less airtight homes. We consider that, in more airtight dwellings, the reliance on purpose-provided ventilators is more important. The design, sizing and positioning of ventilators to provide effective ventilation is more critical, and we propose that is not practical for Approved Document F to provide such guidance.

Mechanical Ventilation

4.19. There is a general trend for more airtight new homes and thus less need for guidance specifically for less airtight homes. Furthermore, mechanical ventilation with heat recovery is generally considered most suitable for more airtight buildings for energy efficiency reasons.

4.20. Continuous mechanical extract systems are intended to remove air on a continuous basis from wet rooms, drawing air via ventilators and infiltration pathways in habitable rooms. If background ventilators are not installed in the dwelling, this risks reduced air supply to some habitable rooms and consequent impact on indoor air quality. To mitigate this risk, it is proposed that background ventilators are also recommended.

4.21. We propose to set guidance for continuous *mechanical extract ventilation* that is only appropriate for more airtight buildings, and for continuous *mechanical supply and extract* which would be appropriate for any level of airtightness.

Q40 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.

Q41 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.

Simplification of Design Guidance

Natural Ventilation

4.22. The current approach to determining minimum size for background ventilators is fairly complex. We have listened to feedback that our approach to calculating background ventilators could be simplified and optimised. Our proposal is to set guidance for the size of background ventilators by room end-use rather than on a whole house basis. Whilst the current approach is more detailed, it can lead to complexities in design and compliance checking.

4.23. In developing the simpler room-based approach, we have looked to achieve at least the same level of background ventilators as in the current Approved Document F. In some cases, it results in more ventilation opening area than necessary to meet the minimum ventilation rates, but in practice, householders have the ability to adjust their ventilation.

4.24. The proposed minimum ventilator areas are given in in the draft Approved Document.

Q42 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.

Intermittent extract fan rates

4.25. No changes are proposed to the actual extract rates for intermittent extract fans. We do propose, however, that the draft Approved Document presents the guidance in a simplified manner.

Mechanical Ventilation

4.26. Approved Document F currently specifies whole dwelling ventilation rates to supply air to habitable rooms according to the number of bedrooms, the number of occupants and a minimum ventilation rate by internal floor area.

4.27. Currently AD F requires an assessment of the likely occupancy of a bedroom and 4 litres per second added to the whole house ventilation rate for each additional occupant (i.e. 4 litres per second for single occupancy and 8 litres per second for dual occupancy). To simplify this, we propose to increase the supply rate to 6 litres per second per bedroom independent of the number of occupants. This saves a designer or commissioning engineer predicting the occupancy of a bedroom (another step and potential uncertainty in the process) and this proposal should help simplify the approach as well as the guidance in the Approved Document. We propose that the minimum whole dwelling ventilation rates are amended to reflect this approach. More detail is provided in the draft Approved Document which accompanies this consultation package.

Q43 Do you agree with the proposed approach 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.

Additional background ventilators for continuous mechanical extract systems

4.28. Based on an analysis of the likely air flow through a background ventilator, we propose that the minimum equivalent area of background ventilators in each habitable room should be 5000 mm^2. Further details are provided in the accompanying Impact Assessment.

Q44 Do you agree that background ventilators should be installed for a continuous mechanical extract system, at 5000mm^2 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.

Updating reference documents

4.29. We have presented simplified guidance in Approved Document Part F alongside this consultation as outlined in Chapter 3. The revised document proposes to update references for British Standards, World Health Organisation guides and CIBSE guides in Appendices B, D and E. This aims to reflect the industry development in providing more robust standards.

Q45 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.

Providing information to building owners

4.30. Existing Part F 2010 requires that a completion checklist and commissioning sheet is completed by the installer of the ventilation system. The completion checklist and commissioning sheet from the Domestic Ventilation Compliance Guide have now been integrated as Appendix C of the draft Approved Document F. As part of educating owners about how their ventilation system performs in practice, we propose that a copy of the completed Appendix C document is provided to the building owner.

Q46 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 and suggest any alternative sources.

Q47 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.

Chapter 5 **Airtightness**

Background

5.1. Airtightness refers to the 'leakiness' or 'draughtiness' of a building. It is a factor in the energy performance of a building; less airtight buildings can waste energy by losing warm internal air to the atmosphere and taking in cold air from the outside during the heating season.

5.2. In the 2020 review we are consulting on improving the way airtightness is considered in the Building Regulations. The proposed changes are detailed below:

Encouraging appropriate levels of airtightness

5.3. To reduce the negative impact of poor indoor air quality associated with making buildings increasingly airtight, we plan to review the way in which the guidance and SAP encourage airtightness through carbon emission incentives.

5.4. Currently increased airtightness is always rewarded in SAP due to the improvement in energy efficiency that airtightness brings in theory. In practice, for naturally ventilated dwellings, very high levels of airtightness can either result in poor indoor air quality, or the need to provide additional ventilation. We wish to discourage making buildings with insufficient ventilation very airtight. To achieve this, we propose to introduce a limit to the energy/ CO_2 credit in SAP so that naturally ventilated buildings are not credited with additional energy savings from any airtightness of $3m^3/m^2.h$ or lower.

5.5. Dwellings with full mechanical ventilation would continue to receive modelled energy savings from increased airtightness, even at air permeability levels less than $3m^3/m^2.h$. This is because mechanically ventilated dwellings, broadly speaking, should have enough ventilation to prevent poor indoor air quality.

Q48 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.

Q49 Do you agree that the limit to the credit should be set at $3m^3/m^2.h$?

a. **Yes**
b. **No – it is too low**
c. **No – it is too high**

If no, please explain your reasoning and provide evidence.

Accounting for uncertainty in airtightness test results

5.6. To better reflect the uncertainty associated with a typical airtightness test, we plan to reduce the precision to which airtightness tests are reported in SAP to a granularity of 0.5 $m^3/m^2.h$. This may have a small effect on the energy calculation in SAP.

Q50 Is having a standard level of uncertainty of 0.5$m^3/m^2.h$ 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$m^3/m^2.h$ is not an appropriate figure**
d. **No – I disagree for another reason**

If no, please explain your reasoning.

Review of sampling approach

5.7. To ensure that airtightness is appropriately tested and understood across developments, and to align with changes to Part F, we plan to mandate airtightness testing in all new dwellings.

5.8. Currently only a portion of the dwellings on a development are required to be airtightness tested, with the option to accept a SAP penalty of +2 $m^3/m^2.h$ at 50Pa for dwellings that are not tested. This may lead to untested dwellings not meeting the required standard.

5.9. AD L1A states that when a dwelling fails an airtightness test, other similar homes should be examined and remediated. We have heard that in some cases, this is not consistently happening. There is also evidence of a 're-test until it passes' culture (with failed tests not consistently being reported), which would suggest that extrapolating results across a site based on sample testing may not be appropriate.

5.10. Testing all properties on a development should demonstrate that they all meet the desired standard. For this reason, we are proposing to airtightness test all new dwellings. If this proposal is taken forward, small developments would no longer be exempt from airtightness tests, and these dwellings must be airtightness tested alongside all other new dwellings.

Q51 Currently, only a proportion of 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.

Q52 Currently, small developments are excluded from the requirement to undergo 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.

Introducing an alternative to the blower door test

5.11. Currently, airtightness is commonly tested using the blower door method. To provide an alternative method of airtightness testing, we are seeking views on introducing the Pulse test as an approved airtightness testing methodology. The Pulse test dynamically measures building air leakage directly at low pressure.

5.12. The Pulse test is performed at a pressure differential of 4Pa as opposed to 50Pa, which is more representative of conditions that properties are likely to experience.

5.13. A constant conversion factor has been identified to convert measurements performed at a pressure differential of 4Pa to 50Pa in SAP.

5.14. The effectiveness of the test in very airtight dwellings has yet to be demonstrated. Therefore, we want to seek views on introducing the Pulse test as an approved method of airtightness testing for new dwellings with a designed airtightness of between 1.5 $m^3/m^2.h$ and the maximum allowable airtightness value in Approved Document volume 1. This is the range that a 58.5l Pulse unit has been demonstrated to perform at in the field trial, which can be accessed via the link below.

5.15. If a building has a design airtightness within the range above, we propose that it can be airtightness tested using the Pulse methodology. If the actual airtightness is then shown to fall outside this range, the test would have to be performed again using a blower door test.

5.16. Further information on the Pulse method of airtightness testing can be found published on the following website, under the downloads tab labelled 'Pulse Test Reports': https://buildtestsolutions.com/technologies/pulse-air-permeability-measurement-system/ or downloaded directly via the following link: https://buildtestsolutions.com/wp-content/uploads/2019/09/Pulse-Test-Reports-as-submitted-to-UK-Government.zip.

Q53 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.

Q54 Do you think that the proposed design airtightness range of between 1.5$m^3/m^2.h$ 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.

Revising the approved methodology

5.17. To ensure that the approved methodology for airtightness testing is independent of all organisations with an associated competent person scheme, we propose approving an airtightness testing methodology written by the Chartered Institute of Building Services Engineers (CIBSE), an independent organisation. A draft consultation version of this methodology will be available on the following website by mid-October: https://cibse.org/knowledge/cibse-publications.

5.18. If the Pulse method is introduced as an approved method for performing an airtightness test, the revised approved document will include a section on the Pulse methodology alongside other methods of airtightness testing.

Q55 Do you agree that we should adopt an independent approved airtightness testing methodology?

a. **Yes**
b. **No**

Please explain your reasoning.

Q56 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**

Background

6.1. Studies have shown there is a significant difference between the design intent and measured energy performance of new build homes, which is often referred to as the "performance gap" [42] [43] [44] [45]. The performance gap in new built homes is particularly affected by three major factors: limitations of energy models; different occupant behaviour of each dwelling; and build quality. Poor build quality in particular can lead to a new home not meeting the intended primary energy rate, CO_2 emission rate, or limiting U-values and can result in higher energy bills for occupants. As the energy performance of new dwellings is also affected by compliance with Building Regulations requirements, the government is considering it within the broader review of reforms on building safety, design, construction and occupation.

6.2. As part of the wider government working package, on 6 June 2019 we published a consultation paper, *Building a Safer Future*, to set out proposals for the reform of the regulatory system that will deliver a stronger system of regulation and oversight. Fundamental to this reform is the creation of a new building safety regulator at the heart of the new regime. The building safety regulator will have responsibility for overseeing design and management of buildings, with a strong focus on ensuring the stricter regime for buildings is enforced effectively and robustly. Our proposals aim to improve compliance and strengthen enforcement and sanctions within the new building safety regulatory system framework.

6.3. In this section of the consultation, we are proposing changes to improve performance and compliance for Part L-specific issues only. Our aim is to enhance the evidence used when producing as-built energy calculations.

6.4. We are proposing to improve the accuracy of as-built energy calculations and reduce the performance gap by providing clearer information about the as-built specifications of new buildings to both Building Control Bodies and to building occupiers. This is part of our wider approved document review.

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[42] Palmer, J., Godoy-Shimizu, D., Tilson, A. & Mawditt, I., 2016. Building Performance Evaluation Programme: Findings from domestic projects, Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/497758/Domestic_Building_Performance_full_report_2016.pdf.

[43] Bell, M., Wingfield, J., Miles-Shenton, D. & Seavers, J., 2010. Low carbon housing Lessons from Elm Tree Mews., p.118. Available at: https://www.jrf.org.uk/report/low-carbon-housing-lessons-elm-tree-mews.

[44] ZCH, 2014. Closing the gap between design and as-built performance: Evidence Review Report, London: Zero Carbon Hub.

[45] Gupta, R., Kotopouleas, A., 2018. Magnitude and extent of building fabric thermal performance gap in UK low energy housing. Available at: https://www.sciencedirect.com/science/article/pii/S0306261918304343#b0240.

Proposed measures to improve compliance and performance

Guidance for typical performance gap issues

6.5. Common examples of poor build quality have been identified in a number of research projects that increase the performance gap in new homes, as referenced above. Technical guidance on how to prevent common issues has been developed and we propose that this be provided throughout Approved Document Part L under the titles *Build Quality*.

6.6. We propose that the guidance on build quality become part of the minimum standard, i.e. reasonable provision for compliance would include the performance gap guidance and would be placed under each functional requirement. It is expected that this minimum guidance should reduce the fabric performance gap, which has been highlighted in research studies.

6.7. The requirements under build quality are standard practice amongst the majority of the housebuilding industry. This guidance is a clarification of the minimum performance expected, should only affect a fraction of existing poor practices and will therefore have minimal impact on capital cost to the housebuilding process.

6.8. The proposed 'Build Quality' sections are summarised below and included in full in Annex C. We propose that they are incorporated into Approved Document L, depending on the outcome of this consultation.

Build Quality: Insulation gaps

6.9. Gaps in insulation can have a significant impact on heat loss and thermal bypass, and risks of condensation and mould. Attention to detail at both the design and construction stages is required. The guidance in this section draws upon some of the key recommendations, applicable to masonry construction, from the Zero Carbon Hub's *Builders' Book*.[46]

6.10. Key points include: design drawings, foundations, floors, windows, doors, walls, roofs, insulation boards, elements bridging external walls, careful coordination of work and comparison against design drawings.

6.11. The full proposed text is in Annex C.

Build Quality: Thermal bridging at junctions

6.12. Thermal bridges occur when an area of a building has significantly higher heat transfer than the surrounding parts. Breaks in insulation, reduced insulation, or more conductive materials can contribute to higher heat losses, which should be quantified and accounted for in SAP calculations.

[46] Zero Carbon Hub, *Builders' Book*, 2015

6.13. This guidance draws upon Zero Carbon Hub's *Thermal Bridging Guide*[47], which provides more detail for masonry and timber construction. The strategies for reducing thermal bridges include: isolate the thermal bridge with insulation (to minimise direct contact with inside/outside); change the geometry of the thermal bridge (to move, remove or reduce size of the component); increase the thermal bridge heat path (to make heat travel further to escape); change the thermal bridge material (to be less conductive). Other third-party publications are also available which provide guidance on junction detailing for particular situations.

6.14. Key points to check include: buildability, product specification, product substitution, foundations, floors, windows, roofs, comparison against design drawings. Blocks below the damp proof course should match those specified in the design (for example, with the correct thermal conductivity).

6.15. The full proposed text is in Annex C.

Build Quality: Airtightness – incoming service penetrations

6.16. Utility services, heating ducts and cables can pass through the primary airtightness membrane (including DPM) and through insulation in the ground floor and external walls, potentially compromising airtightness and thermal performance. These interactions must be carefully planned for and care must be taken during construction.

6.17. Key points to check include: drawings, positioning, groundworks, floor works, sealing.

6.18. The full proposed text is in Annex C.

Build Quality: Airtightness of structure – including walls, roof, floor junction, partitions

6.19. The primary airtightness layer is typically within the external walls, floors and roofs, and so care is needed during construction of these elements to ensure continuity of the air barrier.

6.20. Key points to check include: drawings, external walls, floors and roofs, penetrations, detailing, cavity walls, timber frame, sequencing.

6.21. The full proposed text is in Annex C.

Build Quality: Airtightness around openings – including windows, doors, loft hatches

6.22. Windows and doors should be aligned with the insulation layer in the walls and connect up to the primary air barrier, to avoid compromising airtightness.

6.23. Key points to check include drawings, fixings, sealing, doors and loft hatches.

[47] Zero Carbon Hub, *Thermal Bridging Guide*, 2016

6.24. The full proposed text is in Annex C.

Build Quality: Airtightness – internal services

6.25. Services can increase air-leakage if they penetrate through the building fabric and air barrier. Every one of these penetrations is a potential weak point if not made good and sealed adequately.

6.26. Key points to check include: drawings, design to avoid unnecessary penetrations and seal necessary penetrations.

6.27. The full proposed text is in Annex C.

6.28. Suggested illustrations:

- Example drawing clearly identifying thermal envelope and air barrier
- Thermal bridging strategies from ZCH *Thermal Bridging Guide* p.37

Q57 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.

Q58 Do you have any comments on the Build Quality guidance in Annex C?

New-style compliance report

6.29. Currently Building Control Bodies receive a range of different outputs from SAP software, with varying levels of detail, for them to check Part L of the Building Regulations. We think that a unified approach, with BCBs receiving the same, clear information for every building will improve compliance.

6.30. We have developed a new compliance report, this would be the domestic version of the BRUKL report currently produced for non-domestic buildings. It would be called a Building Regulations England Part L report (BREL) and would be produced using the information from the SAP calculations, see example in Annex D. The new compliance report would provide evidence that the completed work matches the as-built energy model including:

- the product-specific materials that have been used in the construction of the thermal elements;
- the product-specific equipment installed for heating, hot water, ventilation and micro-generation in the dwelling;
- a summary of the U-value and Ψ-value calculations, as used in the as-built emissions and primary energy rate calculations; and

- a summary of the thermal bridging details used, including the source and reference.

6.31. The report would have to be signed by the energy assessor to confirm that the as-built calculations are accurate. The report contains the client name, i.e. the company building the home or the name of the self-builder; the report would have to be signed by a representative of the developer to confirm that the as-built specifications are correct.

6.32. The report would have to be provided to the Building Control Body and could be used as a check list for site inspection of thermal elements. The report should also be provided to the owner of the new home.

Q59 Do you agree with the introduction of a 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.

Photographic evidence

6.33. For existing domestic and non-domestic buildings, time stamped and geotagged photographic evidence of the various building elements to produce an Energy Performance Certificate (EPC) are a mandatory requirement. This is not a requirement for the Part L as-built energy calculations for new build dwellings using the SAP methodology.

6.34. Currently energy assessors must have the following evidence to demonstrate in order to produce an as-built energy calculation:

- construction drawings;
- construction specifications;
- service specifications; and
- a signed statement from the developer, or builder, that the dwelling has been built in accordance with the design.

6.35. We are proposing that photographic evidence is also included as a mandatory requirement to improve the accuracy of energy calculations and to provide assurance that the SAP energy models are a reflection of as-built dwellings.

6.36. To establish a level playing field across all developments, the minimum photographic evidence requirements include a short, non-exhaustive list of high-risk areas where changes, or substitutions, could occur during the construction process. The list includes six basic elements:

- Insulation levels and insulation product types – e.g. level and coverage of loft insulation, wall insulation, insulation type;
- Main and Secondary Heating systems – e.g. installed make and model; controls within zones/ areas;
- Ventilation system;
- Domestic hot water system type (only applicable if separate from heating system) – i.e. electric showers for example;
- Evidence of LZC technologies and relevant data – installed solar water heating, PV panels, battery for example; and
- Construction details – one image per thermal junction type would be sufficient.

6.37. If substitutions are made during the construction process, these would be reflected in the as-built photos. The government believes that it is standard practice across many organisations to record photographic evidence of the six proposed elements for internal auditing purposes and quality assurance of the build quality.

6.38. The government considers that photographic evidence offers a simple, effective and robust method of improving the quality of energy modelling and supporting more accurate assessment of the as-built energy performance of new dwellings.

Q60 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.

Information to Building Control

6.39. Building Regulations Part L1A 2013 edition (incorporating 2016) amendments requires the developer, or builder, to produce a signed specifications sheet that "the building was constructed in accordance with the list of specifications submitted to the BCB before the work started".

6.40. We propose that the signed compliance report (BREL) and the photographic evidence is provided to the Building Control Body to confirm that the minimum requirements of the relevant building regulations are met. Due to the complex nature of the SAP methodology, we expect that this change will simplify the process of checking compliance with the Part L requirements for Building Control. Considering the signed specification sheet is already a mandatory requirement, the proposed addition of photographic evidence is expected to provide Building Control Bodies with better information of how the as-built energy assessment has been produced.

6.41. Supplementing the new style compliance report (BREL), if adopted, with photographic evidence aims to provide a simple and robust method of demonstrating compliance with the energy efficiency requirements of the proposed Part L.

Q61 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**

Please explain your reasoning.

Providing information to householders

6.42. Regulation 40 stipulates that the owner is provided with "sufficient information about the building, the fixed building services and their maintenance". We propose that the signed compliance report (BREL) and the photographic evidence is provided to the owner; likely at the same time as the EPC. This aims to help homeowners understand better how the as-built energy calculation of their home was undertaken.

6.43. The approach champions transparency and provides occupiers with certainty that the home they are buying is built as per the energy efficient design specifications. As home purchasing is often said to be the most expensive and stressful of life experiences[48], the government aims to reassure consumers that the home they are purchasing is energy efficient. The signed BREL document and photographic evidence would provide easy to understand information to the dwelling occupier on what technologies and construction details were used to make their home low carbon and energy efficient.

6.44. More information could also be given to the purchasers of new homes on their EPC. We think this information should include the version of Part L that the home is built to e.g. Part L 2010. This addition is expected to champion transparency of how the as-built energy assessment was calculated, improve standards and provide more clarity to consumers[49]. The proposal of highlighting which Building Regulations Part L the home is being built to adopts recommendations from the BEIS select committee.[50]

Q62 Do you agree with the proposal to provide the homeowner with the signed standardised compliance report (BREL) and photographic evidence?

a. **Yes**
b. **No**

Please explain your reasoning.

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[48] Research on buying and selling homes. BEIS, 2017 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/653581/buying-selling_homes-research.pdf

[49] New-building housing: construction defects- issues and solutions (2019) http://researchbriefings.files.parliament.uk/documents/CBP-7665/CBP-7665.pdf

[50] Energy efficiency: building towards net zero. BEIS Select Committee, 2019. https://publications.parliament.uk/pa/cm201719/cmselect/cmbeis/1730/173012.htm

Q63 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.

Home user guides

6.45. Home user guides produced by various organisation vary in quality. We propose that a national template with minimum requirements for a home user guide should be developed and required through building regulations. The NHBC and CIBSE TM60 provide good practice in the provision of home user guides and we would look to require home user guides of this standard.

6.46. We are considering whether a consumer-friendly home user guide should be provided to occupants explaining how to use the building services efficiently. Occupiers have a large role to play in how their homes perform in operation and providing easy-to-use educational guides can support them in saving carbon and keeping their fuel bills low. Our proposal for home user guides only relates to energy efficiency and ventilation requirements. We propose that a home user guide should contain clearly marked sections for ventilation, heating and hot water and staying cool in summer. The home user guides could use colour-coding, illustrations and tutorials and very simple advice that occupiers without any technical background could use to maintain a healthy, energy efficient home.

Q64 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.

Chapter 7 **Transitional Arrangements**

Background

7.1. Whenever changes to the Building Regulations or approved standards take place, transitional arrangements apply. When a developer submits a building notice or full plans application to the local authority, the Building Regulations standards in place at the time of the application will apply, so long as work under the building notice or full plans application has already started or starts within a specified period of the notice being given.

7.2. The transitional arrangements exist for good reason – they mean that developers have assurance about the standards to which they must build, and that they should not have to make material amendments to work which is already underway when new regulations came into force.

7.3. However, we are aware of cases of housing developments being built out to energy efficiency requirements that have been superseded more than twice with changes to Part L of the Building Regulations. While we appreciate that many housebuilding sites are built out over a number of years, it cannot be right that new homes are being built to old standards introduced in 2010 or even 2006. It means that occupiers do not benefit from the levels of energy efficiency and the bill savings they would expect from a brand-new home. It also means that new homes are contributing more carbon dioxide emissions than should be expected, which has an impact on climate change.

7.4. To mitigate this, and as part of the roadmap to the Future Homes Standard, we propose to introduce a more stringent set of transitional requirements in 2020 to make sure that developers do not continue to build to older energy efficiency standards for longer than is appropriate.

Transitional arrangements for 2020 uplifts

7.5. Where a building notice, initial notice or full plans deposit is submitted to the building control body before the new energy efficiency standards described in chapter three of this consultation come into force, we propose that the transitional arrangements should only apply to individual buildings on which building work has started within a reasonable period. We are consulting on the length that reasonable period should be.

7.6. Where work has not commenced on a specific building covered by the building notice, initial notice, or full plans within a reasonable period, that building would not benefit from the transitional provisions and so it (and any other non-commenced buildings covered by the notice/plans) would need to comply with the latest set of energy efficiency standards. Those already benefiting from transitional provisions applied to earlier changes to Part L and the energy efficiency standards would not be affected.

7.7. This is a more stringent transitional arrangement than usual, to try to ensure new dwellings are meeting up to date standards. Although this may result in different

houses in the same development being built to different standards, we expect this to help pave the way for the Future Homes Standard, and housebuilders may be encouraged to build out more quickly on their sites. In turn, this would improve carbon savings. Developers will no longer be able to lock in earlier standards for long periods. The focus will be on compliance by individual dwellings rather than the whole development.

Q65 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.

Q66 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.

Transitional Arrangements for the 2025 Future Homes Standard

7.8. We want to ensure that homes conform to the new Future Homes Standard in 2025 as soon as reasonably possible. We want to prevent housebuilders from submitting notices or plans before the new requirements come into force in order to avoid building to new standards. This means that consumers do not benefit from better standards and simultaneously means that homes contribute more carbon than is expected. We want to encourage quicker building out on developments to ensure all benefit from the changes. The following are some of the possible changes that might apply for transitional arrangements relating to changes made in 2025:

- to reduce the reasonable period for an individual building to start being built to be shorter than the 2020 period, while retaining the application of transitional arrangements to individual buildings only;
- to amend or remove existing Part L transitional protections applicable to those already building to previous standards;

- to amend section 32 of the Building Act 1984 so that full plans would lapse after a period of time for all individual buildings not yet built (which would require fresh full plans, therefore building to updated standards)

Q67 What is your view on the possible transitional arrangements regarding changes to be made in 2025?

Chapter 8 **Feedback on the Impact Assessment**

8.1. Building Regulations greatly influence how our buildings are constructed and used. As such, they help to deliver significant benefits to society. Regulation can also impose costs on both businesses and individuals. We have published an Impact Assessment which considers the costs and benefits of the proposed changes to Part L and Part F of the Building Regulations. The Impact Assessment is an important part of the consultation, as its analysis has shaped the proposals, and we are keen to test the results. As such, consultees are encouraged to read the impact assessment and respond to the questions below.

8.2. To note, the impact assessment only covers the proposed changes to the Building Regulations to be implemented in 2020. A separate Impact Assessment will be produced for the Future Homes Standard when we consult in the future on its detailed implementation.

Q68 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.

Q69 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.

About this consultation

This consultation document and consultation process have been planned to adhere to the Consultation Principles issued by the Cabinet Office.

Representative groups are asked to give a summary of the people and organisations they represent, and where relevant who else they have consulted in reaching their conclusions when they respond.

Information provided in response to this consultation, including personal data, may be published or disclosed in accordance with the access to information regimes (these are primarily the Freedom of Information Act 2000 (FOIA), the Data Protection Act 2018 (DPA), the General Data Protection Regulation, and the Environmental Information Regulations 2004.

If you want the information that you provide to be treated as confidential, please be aware that, as a public authority, the Department is bound by the Freedom of Information Act and may therefore be obliged to disclose all or some of the information you provide. In view of this it would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information, we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding on the Department.

The Ministry of Housing, Communities and Local Government will process your personal data in accordance with the law and in the majority of circumstances this will mean that your personal data will not be disclosed to third parties. A full privacy notice is included at Annex A.

Individual responses will not be acknowledged unless specifically requested.

Your opinions are valuable to us. Thank you for taking the time to read this document and respond.

Are you satisfied that this consultation has followed the Consultation Principles? If not or you have any other observations about how we can improve the process please contact us via the complaints procedure.

Annex A **Privacy Notice**

Personal data

The following is to explain your rights and give you the information you are be entitled to under the Data Protection Act 2018.

Note that this section only refers to your personal data (your name address and anything that could be used to identify you personally) not the content of your response to the consultation.

1. The identity of the data controller and contact details of our Data Protection Officer
The Ministry of Housing, Communities and Local Government (MHCLG) is the data controller. The Data Protection Officer can be contacted at dataprotection@communities.gsi.gov.uk

2. Why we are collecting your personal data
Your personal data is being collected as an essential part of the consultation process, so that we can contact you regarding your response and for statistical purposes. We may also use it to contact you about related matters.

3. Our legal basis for processing your personal data
The Data Protection Act 2018 states that, as a government department, MHCLG may process personal data as necessary for the effective performance of a task carried out in the public interest. i.e. a consultation. We have a statutory duty to consult.

3. With whom we will be sharing your personal data
Any personal data collected will not be shared outside of MHCLG or for any purpose other than matters relating to the consultation. Any data that will be shared with organisations outside of MHCLG will be anonymised.

4. For how long we will keep your personal data, or criteria used to determine the retention period.
Your personal data will be held for two years from the closure of the consultation

5. Your rights, e.g. access, rectification, erasure
The data we are collecting is your personal data, and you have considerable say over what happens to it. You have the right:

a. to see what data we have about you
b. to ask us to stop using your data, but keep it on record
c. to ask to have all or some of your data deleted or corrected
d. to lodge a complaint with the independent Information Commissioner (ICO) if you think we are not handling your data fairly or in accordance with the law. You can contact the ICO at https://ico.org.uk/, or telephone 0303 123 1113.

6. The Data you provide directly will be stored by Survey Monkey on their servers in the United States. We have taken all necessary precautions to ensure that your rights in terms of data protection will not be compromised by this.

7. Your personal data will not be used for any automated decision making.

8. Your personal data will be stored in a secure government IT system. After consultation closes, we will move the data from the third party system used to gather the data to our internal systems.

Annex B **Changes to BR 443**

These are the main changes to the new version of BR 443 (2019), however the document should be reviewed in full for other minor changes. The latest version is available for this consultation at: https://www.bregroup.com/sap/sap10/.

In general, BR 443 (2019) is an update to the 2006 edition, primarily reflecting changes in British, European and International standards; industry practice; and industry publications.

Since publication of the previous edition of this document, European standards specifying calculation methods for thermal properties have been amended, replacing the previous British standards BS EN ISO 6946, BS EN ISO 10211, BS EN ISO 10456, BS EN ISO13370, and BS EN ISO 13789 in addition to many other standards.

Earlier versions of this publication included references to the standards which were applicable at the time of publication. This document uses references to BS EN ISO standards which were published from 2017.

Added:

- U-values obtained by in-situ measurement
- U-values of timber building kits
- U-values of “Green” roofs (inverted)
- U-values of “Blue” roofs (inverted)
- U-values for other types of roofs, e.g. “Green” or “Blue” roofs, which are not inverted
- New categorisations added to differentiate treatment of windows, roof windows and rooflights
- Methods of calculation of U-values given for each category, including calculation for the compliance and for energy calculations, including:
    - windows;
    - roof windows;
    - out-of-plane rooflights;
    - in-plane rooflights.
- Instruction for dealing with U-values for lantern- or box-style rooflight kerbs / upstands
- U-values of dynamic transparent building elements
- U-values of existing (old) walls, roofs and floors in dwellings
- Conventions for treatment of heat capacity
- Updates to appendix A: Glossary and definitions.

Expanded and clarified items:

- Thermal resistance of foam or mineral wool insulation with aluminium foil facing
- Thermal resistance of bubble-foil and multi-foil insulation
- Total thermal resistance of multi-foil insulation and adjacent airspaces
- Reflective breather membranes, vapour control layers, air barriers.
- Airspace resistance

- Wind-posts and masonry support brackets
- Slab-on-ground floor (ground-bearing floor slabs)

Revised:

- Voided masonry units
- Rainscreen cladding
- Inverted roofs

Annex C **Build Quality**

Build Quality: Insulation gaps

Gaps in insulation can have a significant impact on heat loss and thermal bypass, and risks of condensation and mould. Attention to detail at both the design and construction stages is required.

This draft guidance could be included in Approved Document L:

- **Design drawings**: review for clarity, buildability and robustness of details. Drawings should identify a continuous insulation layer. Where elements might interrupt the insulation layer, ensure that designs provide clear solutions for these.
- **Foundations**: insulation should be tight to the structure without gaps. Insulation should be fitted below damp proof course level.
- **Floors:** insulation should be installed tight to structure, without gaps. Perimeter insulation should be continuous and details should allow for insulation at door thresholds.
- Windows: should be installed with less than 10mm tolerance all around between the frame and structural opening; overlapping the frame with the cavity to a minimum of 30mm. Fully insulated and continuous cavity closers should be used, installed tight to insulation and cavity. Lintels that minimise heat loss should be used.
- Doors: should overlap with cavities by at least 50mm.
- **Walls:** insulation should be tight to structure, and to cavity closers, lintels and cavity trays. Where fire-stopping socks are required these should fully fill heads of cavities.
- **Roofs:** truss design should seek to increase the depth of roof insulation which can be accommodated at eaves. Insulation should be installed tight to structure, without gaps and continuous to the wall insulation.
- **Insulation boards:** where these are used care should be taken to avoid any gaps between boards or between the boards and structure (which may be affected by e.g. mortar snots). All joints between rigid insulation boards should be lapped or sealed with tape.
- **Elements bridging external walls**: should be reduced in the building design wherever possible. Examples include steel beams, cavity trays, meter boxes and subfloor vents. When present, their impact on the insulation layer should be mitigated (for example, through installing insulation behind them where they are on the cold side of the construction).
- **Careful coordination of work:** to avoid subsequent work stages damaging previous work, for example through displacing insulation.
- **Comparison against design drawings:** an on-site audit (supported by photographs) to ensure details have been followed prior to elements being closed off.

Build Quality: Thermal bridging at junctions

Thermal bridges occur when an area of a building has significantly higher heat transfer than the surrounding parts. Breaks in insulation, reduced insulation, or more conductive materials can contribute to higher heat losses, which should be quantified and accounted for in SAP calculations.

This draft guidance could be included in Approved Document L:

- **Buildability:** junction details should be reviewed for their buildability in practice and sequencing carefully considered.
- **Product specification:** whether opportunities have been considered to reduce thermal bridging – for example, in masonry construction using lightweight blockwork in the inner leaf of the cavity wall can help reduce bridging at various junctions; and in timber construction using insulated plasterboard on the inside of the frame can help reduce bridging at various junctions. Using lightweight blockwork in the party wall can improve performance at junctions with the floor.
- **Product substitution:** it is particularly important that the correct products are used, matching design details.
- **Foundations:** blocks below the damp proof course should match those specified in the design (for example, with the correct thermal conductivity).
- **Floors:** the wall to floor junctions should be detailed to achieve continuity of insulation. Perimeter insulation and cavity insulation below the damp proof course (where applicable) should not be omitted. Increasing the perimeter insulation thickness can improve performance. Intermediate floor to wall junctions should be detailed to avoid insulation gaps.
- **Windows:** specify lintel designs which minimise thermal bridging and check these are not substituted on-site. Increasing frame overlaps can also improve thermal bridging at lintels, sills and jambs. Insulated cavity closers should be used. Detailing at reveals should be considered - for example, insulated plasterboard can improve performance.
- **Roofs:** continuity of insulation should be achieved at the wall to eaves and wall to gable junctions – for example, insulation should be installed to the top of the wall plate, soffit insulation should not be omitted at eaves, and designs should seek to increase the depth of roof insulation which can be accommodated at eaves. The roof insulation should be installed when the eaves are still accessible. The omission of perimeter roof insulation impacts negatively on thermal bridging at gable to wall and party wall head junctions.
- **Comparison against design drawings:** an on-site audit (supported by photographs) to ensure details have been followed.

Build Quality: Airtightness – incoming service penetrations

Thermal bridges occur when an area of a building has significantly higher heat transfer than the surrounding parts. Breaks in insulation, reduced insulation, or more conductive materials can contribute to higher heat losses, which should be quantified and accounted for in SAP calculations.

This draft guidance could be included in Approved Document L:

- **Drawings:** should clearly identify the position and the extent of the air barrier.
- **Positioning:** of services, ducts and cables in relation to the airtightness membrane before starting works.
- **Groundworks:** services need to be accurately set out by the groundworks sub-contractor to prevent screed, insulation and membranes having to be disturbed at a later stage. Check setting out before screeding works commence. Ensure sufficient space between adjacent service penetrations to allow adequate screed flow between ducts.
- **Floor works:** use temporary supports for services during floor works.
- **Sealing:** fit grommets, collars or use other proprietary air sealing medium to seal around incoming services.

Build Quality: Airtightness of structure – including walls, roof, floor junction, partitions

The primary airtightness layer is typically within the external walls, floors and roofs, and so care is needed during construction of these elements to ensure continuity of the air barrier.

This draft guidance could be included in Approved Document L:

> **Drawings:** should clearly identify the position and the extent of the air barrier.
> **External walls, floors and roofs:** should be abutted tightly at all junctions.
> **Penetrations:** such as structural steelwork need to be effectively sealed for airtightness. Timber joist hangers should be considered in lieu of penetrations.
> **Detailing:** ensure adequate detailing is provided and that the details are followed correctly.
> **Cavity walls:** the inner block leaf should be pointed up within the cavity with joints fully filled. Parge coats or plaster on blockwork should be considered to improve airtightness. In circumstances where internal plasterboard linings are used as a secondary air barrier, apply continuous ribbons of adhesive around board edges and any openings.
> **Timber frame:** the vapour control layer should be lapped at seams and junctions, and taped where it is the airtightness barrier. Any damage such as tears should be repaired prior to boarding.
> **Sequencing:** ensure internal sealing works, such as parge coats or vapour control layer seals are carried out prior to other constructions that may hinder the implementation of these works, e.g. staircase installations.

Build Quality: Airtightness around openings – including windows, doors, loft hatches

Windows and doors should be aligned with the insulation layer in the walls and connect up to the primary air barrier, to avoid compromising airtightness.

This draft guidance could be included in Approved Document L:

> **Drawings:** should clearly identify the position and the extent of the air barrier.
> **Fixings:** should be achieved by mechanical means wherever possible. Care should be taken to avoid damage to the airtightness barrier from fixings. Should it not be possible to achieve a good seal by mechanical means, compressible seals and expanding foam help to reduce unsealed and uninsulated gaps.
> **Sealing:** the sealing methods must be robust to ensure a good seal. Gun sealant should not be relied on for gaps greater than 5mm.
> **Doors:** architectural detailing needs to consider how the airtightness membrane within the floor slab and the insulation will connect up to the door and be protected during the works stage.
> **Loft hatches:** should be suitably chosen to ensure optimum airtightness.

Build Quality: Airtightness – internal services

Services can increase air-leakage if they penetrate through the building fabric and air barrier. Every one of these penetrations is a potential weak point if not made good and sealed adequately.

This draft guidance could be included in Approved Document L:

> **Drawings:** should clearly identify the position and the extent of the air barrier.
> **Design to avoid unnecessary penetrations** through the air barrier – dedicated service zones can avoid most routing-related penetrations.
> **Core drill** service penetrations to limit damage and make good any damage caused.
> **Seal necessary penetrations** directly within the air barrier itself, using proprietary grommets or collars. Where membranes are employed use careful detailing to achieve a robust and durable seal at these penetrations. When cutting holes through the membrane double check locations co-ordinate with structure and minimise hole size.

The Build Quality sections above can be integrated into the Approved Document dependent on the outcome of this consultation.

Annex D **BREL Compliance Report**

Building Regulations England Part L (BREL) Compliance Report

Approved Document L 20XX Edition, England assessed by xxx SAP 10 program, x.x.x.x

Project Information			
Assessed By	Example Assessor	Building Type	e.g. Semi-detached House

Dwelling Details			
Assessment Type	New Dwelling – AS BUILT STAGE	Total Floor Area	e.g. 84m^2
Site Reference	Example Site	Plot Reference	Example House
Address	Example Site Address		

Client Details	
Name	Example Client
Address	Example Client Address

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system:	e.g. Mains gas		
Target carbon dioxide emission rate	xx	kg/m^2	
Dwelling carbon dioxide emission rate	xx	kg/m^2	OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	xx	kWh/m^2	
Dwelling primary energy	xx	kWh/m^2	OK

2a Fabric U-values

Element	**Average U-Value**	**Highest U-Value**	**Key layer elements to achieve U-Value: Mfr. / Product (Thickness)**	
External Wall	0.15 (max. 0.26)	0.18 (max. 0.70)	Layer 1: Mineral wool batt Insulation Ltd / MB200 (xxx mm)	OK
Party wall	0.00 (max 0.20)	-	Cavity sock	OK
Floor	0.11 (max. 0.18)	0.11 (max. 0.70)	Layer 1: EPS EPS Insulation Ltd / EP150 (xxx mm)	OK
Roof	0.11 (max. 0.16)	0.15 (max. 0.35)	Roof 1, Layer 1: Mineral wool roll Insulation Ltd / MR 300 (xxx mm)	OK
			Roof 2, Layer 1: Mineral wool batt Insulation Ltd / MB200 (xxx mm)	
			Roof 2, Layer 2: Insulated lining board Thermal Boards Ltd / TB50 (xxx mm)	
Openings	1.19 (max 1.60)	1.20 (max 3.30)	Type 1: Windows Windows Ltd / DG Plus	OK
			Type 2: External Doors Doors Ltd / Door Plus	
			Type 3: Roof Windows Roofwindows Ltd / DG Roof 1	

2b Thermal Bridging

Summary of thermal bridging calculated from linear thermal transmittances for each junction					OK
Main element	**Junction detail**	**Source type**	**W/m.K**	**Reference**	
External wall	E2 Other lintels	Independently assessed	0.05	Xxxx/TB/01	
	E3 Sill	Independently assessed	0.05	Xxxx/TB/02	
	E4 Jamb	Independently assessed	0.05	Xxxx/TB/03	
	E5 Ground floor	Independently assessed	0.16	Xxxx/TB/03	
	E6 Intermediate floor	Table K1 default	0.14		
	E10 Eaves (ins. at ceiling)	Table K1 default	0.12		
	Etc				
Party wall	P1 Ground floor	Table K1 default	0.32		
	P2 Intermediate floor	Table K1 default	0.00		
	Etc				
Roof	R5 Ridge	Table K1 default	0.24		
	Etc				

3 Air permeability

Air permeability at 50 pascals	4.2 (measured value)	OK
Maximum	8.0 (limit value)	
Air permeability test certificate ref	e.g. iATS reference: 12345678 (hyperlinks to report)	

4 Heating efficiency

Main heating system	Boiler system with radiators or underfloor heating - mains gas *Minimum Efficiency XX.0 %*		OK
	Emitter type	Radiators	
	Flow temperature	55 °C	
	Type	System boiler	
	Manufacturer	Boiler Systems Ltd	
	Model	Boiler Model 12	
	SEDBUK Efficiency	89.5%	
Secondary heating system	None		

5 Cylinder insulation

Hot water storage	200 litre cylinder *Maximum permitted loss xx kWh/day*		OK
	Type	200 litre cylinder	
	Manufacturer	DHW Cylinders Ltd	
	Model	DHW200	
	Declared cylinder loss	1.50 kWh/day	
Primary pipework insulated	Yes		OK
Waste water heat recovery	Type	Horizontal	OK
	Efficiency	60% efficient	
	Manufacturer	WWHR Ltd	
	Model	Shower-15	

6 Controls

Space heating	Time and temperature zone control (by plumbing arrangement)		OK
	ErP Class V Controls		
	Manufacturer	SHTG Controls Ltd	
	Model	Smart 247	

Hot water	Cylinderstat and independent timer		OK
	Manufacturer	DHW Controls Ltd	
	Model	Timer 247	

7 Low energy lights

Installed efficacy (lamp lumens per circuit watt – lm/W)	66.9 (100% LED or CFL fixtures; 0% other fixture types)		OK
Minimum efficacy (lm/W)	60 (average)		

8 Mechanical ventilation

Type of system	Continuous supply and extract system (MVHR) *Maximum specific fan power 1.5* *Minimum efficiency 70%*		OK
	Manufacturer	Ventilation Ltd	
	Model	MVHR300	
	Specific fan power	0.6	
	MVHR efficiency	89%	
Ventilation commissioning certificate	e.g. Part F commissioning certificate reference 12345678 (hyperlinks to report)		

9 Local generation

Type of system	Solar PV		OK
	Manufacturer	Solar PV Systems Ltd	
	Panel type	Panel B	
	Array size	4 m^2	
	Overshading	None/very little	
	Orientation	SE	
MCS certificate	e.g. 12345678 (hyperlinks to report)		

10 Supporting documentary evidence

Documentary evidence identified in 10.1 and 10.2 is needed to confirm the data values used for any calculations undertaken, manufacturer declarations made, and tests performed as reflected in this As-Built BREL Compliance Report are correct. **OK**

10.1 SAP Conventions (v7.01), Appendix 1 (documentary evidence) schedules the minimum documentary evidence required.

10.2 Photographic evidence of key stages during construction that confirm the products identified in this BREL are used in this dwelling and workmanship is of sufficient quality to support the calculated values claimed in 2a and 2b.

11 Declarations

a. Assessor Declaration

This declaration by the assessor is confirmation that the contents of this BREL report are a true and accurate reflection of the dwelling as-built and that the supporting documentary evidence (identified in 10.1 and 10.2) pursuant to Part L of the Building Regulations 2010 (as amended) has been reviewed in the course of preparing this BREL report. **OK**

Signed ..... Assessor ID .....

Name ..... Date .....

b. Client Declaration

This declaration by the client is confirmation that that the dwelling has been constructed and completed according to the specifications set out in this BREL report. **OK** OR **FAIL***

Signed ..... Organisation .....

Name ..... Date .....

* if not signed

Annex E **Consultation Questions**

We strongly encourage responses via the online survey, particularly from organisations with access to online facilities such as local authorities, representative bodies and businesses. Consultations receive a high-level of interest across many sectors. Using the online survey greatly assists our analysis of the responses, enabling more efficient and effective consideration of the issues raised.

To respond to the consultation through the online survey, please access this link: https://www.surveymonkey.co.uk/r/TQW8GQ9

Respondent Details

Please provide the below respondent details

a. Name

b. Position (if applicable)

c. Organisation (if applicable)

d. Address (including postcode)

e. Email address

f. Telephone number

g. Please state whether you are responding on behalf of yourself or the organisation stated above

Which description below best identifies you or the organisation you are responding to this consultation on behalf on?

☐ Builder/Developer
☐ Installer/Specialist sub-contractor
☐ Designer/Engineer/Surveyor
☐ Local Authority
☐ Building Control Approved Inspector
☐ Competent Persons Scheme Operator
☐ Manufacturer/Supply chain
☐ Property Management
☐ National representative or trade body
☐ Professional body or institution
☐ Research/Academic organisation
☐ Energy sector
☐ Other (please specify): _____

Please tick the one box which best describes the size of your or your organisation's business.

☐ Micro – typically 0 to 9 full-time or equivalent employees (incl. sole traders)
☐ Small – typically 10 to 49 full-time or equivalent employees
☐ Medium – typically 50 to 249 full-time or equivalent employees
☐ Large – typically 250+ full-time or equivalent employees
☐ None of the above (please specify): _____

Chapter 2 The Future Homes Standard

Q1 Do you agree with our expectation that a home built to the Future Homes Standard should produce 75-80% less CO2 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.

Q2 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?

Q3 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.

Q4 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.

Q5 Do you agree with the proposed timings presented in Figure 2.1 (displayed in Chapter 2) 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.

Chapter 3 Part L Standards for New Homes in 2020

Q6 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.

Q7 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.

Q8 Do you agree with using CO_2 as the secondary performance metric?

a. Yes
b. No

Please explain your reasoning.

Q9 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.

Q10 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.

Q11 Do you agree with the minimum fabric standards proposed in table 3.1?

Table 3.1 - Minimum standards for fabric performance				
		Yes	No – should be more insulating	No – should be less insulating
External walls	0.26 W/m^2.K			
Party walls	0.20 W/m^2.K			
Floor	0.18 W/m^2.K			
Roof	0.16 W/m^2.K			
Windows, roof windows, glazed roof lights, curtain walling, and pedestrian doors	1.6 W/m^2.K			
Roof-lights	2.2 W/m^2.K			
Air permeability	8m^3/m^2.K at 50Pa			

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

Q12 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.

Q13 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.

Q14 Do you agree that the limiting U-value for roof-lights should be based on a roof-light in a horizontal position?

c. Yes
d. No

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

Q15 Do you agree that we should adopt the latest version of BR 443?

c. Yes
d. No

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

Q16 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.

Q17 Do you agree with the proposed changes to minimum building services efficiencies and controls set out in table 3.2?

Table 3.2: Proposed revisions to minimum building services efficiencies and controls for new dwellings				
Application	**Proposed Part L 2020 standard**	**Yes**	**No – proposed standard goes too far**	**No – proposed standard does not go far enough**
Gas boiler efficiency	92% ErP			
Heat pump efficiency	SCOP 2.80			
Comfort cooling efficiency	SEER 3.87			
Lighting	60 lamp lumens per circuit-watt			

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

Q18 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.

Q19 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.

Q20 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.

Q21 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.

Q22 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.

Q23 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.

Q24 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.

Q25 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.

Q26 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.

Q27 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.

Q28 Do you agree with incorporating the Compliance Guides into the Approved Documents?

a. Yes
b. No

If no, please explain your reasoning.

Q29 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.

Q30 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.

Q31 Do you agree with the proposals for restructuring the Approved Document guidance?

a. Yes
b. No

If no, please explain your reasoning.

Q32 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.

Q33 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.

Q34 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.

Chapter 4 Part F Changes

Q35 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.

Q36 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.

Q37 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.

Q38 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.

Q39 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.

Q40 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.

Q41 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.

Q42 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.

Q43 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.

Q44 Do you agree that background ventilators should be installed for a continuous mechanical extract system, at 5000mm^2 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.

Q45 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.

Q46 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.

Q47 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.

Chapter 5 Airtightness

Q48 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.

Q49 Do you agree that the limit should be set at $3m^3/m^2.h$?

a. Yes
b. No – it is too low
c. No – it is too high

If no, please explain your reasoning and provide evidence.

Q50 Is having a standard level of uncertainty of 0.5 $m^3/m^2.h$ 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 $m^3/m^2.h$ is not an appropriate figure.
d. No – I disagree for another reason

If no, please explain your reasoning.

Q51 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.

Q52 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.

Q53 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.

Q54 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

Q55 Do you agree that we should adopt an independent approved airtightness testing methodology?

a. Yes
b. No

Please explain your reasoning.

Q56 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

Q57 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.

Q58 Do you have any comments on the Build Quality guidance in Annex C?

Q59 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

Q60 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

Q61 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

Q62 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.

Q63 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.

Q64 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

Chapter 7 Transitional Arrangements

Q65 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.

Q66 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.

Q67 What is your view on the possible transitional arrangements regarding changes to be made in 2025?

Chapter 8 Feedback on the Impact Assessment

Q68 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.

Q69 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.