Future Homes Standard Consultation Concluded

On Tuesday 19 January 2021, the government responded to the Future Homes Standard consultation. This document will summarise the key notes taken away from the government's response that impact Part L1 2021 requirements.

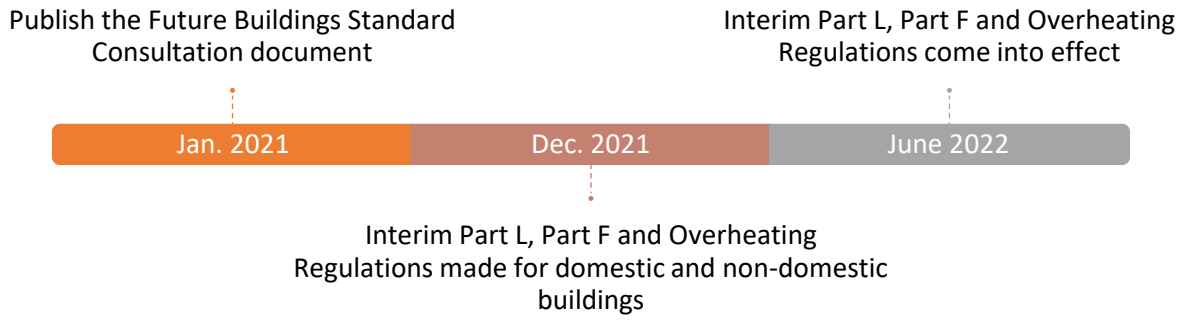
The response highlighted the government's ambition to achieving net zero carbon by 2050 and ensuring that new homes are built to be "zero carbon ready" as the National Electricity Grid decarbonises. New homes that are built to the Future Homes Standard will produce 75% less carbon dioxide (CO_2) emissions compared to new homes built to the current regulations. This will be achieved through high fabric standards and low-carbon heating systems.

The Draft Part F, Part L 2021 and Overheating regulations and Future Buildings Standard consultation were also released with the government's response.

Proposed Timelines

The big question – when will Part L 2021 be enforced and when do we have to comply?

Part L 2021 is a key stepping stone towards the standards that will be required by the Future Homes Standard and Part L regulations enforced in 2025. Due to the time elapsed since the last update to Part L of the Building Regulations, the government's short term plan is to implement an interim Part L uplift for new homes and non-domestic buildings as swiftly as possible. The following timeline has therefore been proposed:



The above timeline indicates Part L 2021 will be enforced in June 2022 for all new developments. As with previous updates to Part L, there is a transitional period which allows developers to continue to construct to the previous version of the Building Regulations if the transitional arrangement criteria are met.

For a building to remain under Part L 2013 of the Building Regulations developers will need to meet **both** of the following:

i) Submit a building/initial notice or deposited plans by June 2022; and
ii) Commence work on each **individual building** by June 2023.

The proposed transitional arrangement for Part L 2021 applies to **individual buildings** (i.e. block of flats, terraced houses, semi-detached houses) and does not apply to the whole development as with previous

updates. A development with multiple buildings could therefore have individual buildings being constructed to meet different energy efficiency standards, i.e. Part L 2013 and Part L 2021.

For the purposes of transition, the definition for commencement works will not change from the existing 2013 definitions:

- Excavation for strip or trench foundations or for pad footings.
- Digging out and preparation of ground for raft foundations.
- Vibrofloatation (stone columns) piling, boring for piles or pile driving.
- Drainage work specific to the building(s) concerned.

The Standard Assessment Procedure (SAP) methodology will likely be updated to version SAP 10.3 by the time Part L1 2021 comes into effect. Version SAP 11 will be produced and adopted for the Future Homes Standard and Part L 2025 regulations.

The FEE Remains

Good news! They have decided to keep the Fabric Energy Efficiency (FEE) standards as one of the main performance metrics in Part L1 2021. This will ensure that a high standard of fabric performance is applied to new dwellings.

There was a lot of concern when it was proposed to remove this standard from the New Part L as without the FEE criteria it would have been possible to build a new home with lesser fabric standards compared to a new home built under the current Part L1A 2013, which does not make sense when the whole point is that we want to reduce energy, not increase it. However, following the consultation the government have realised the important role that the FEE standards have in maintaining high fabric standards.

Householder Affordability Metric Removed

Having decided to keep the fabric standards the government have decided to remove the householder affordability criteria in Part L1 2021. With the FEE standards applied it is believed that this will ensure that new homes will be designed to be affordable as the space heating demand will be reduced to an acceptable level.

The Future Homes Standard and Part L 2025 will have a higher fabric standard for the notional dwelling (as outlined in **Table 1**), so it might be that the FEE standard will be removed in the future Part L and replaced with householder affordability.

Main Performance Metrics

The main performance metrics for Part L1 2021 will therefore be the following:

- Target CO_2 Emissions Rate
- Target Primary Energy Rate
- Target Fabric Energy Efficiency
- Minimum Standards (building fabric and system efficiencies)

Notional Dwelling Specification

Two Notional Dwelling specifications were proposed during the consultation. The Notional Dwelling is used to calculate the Target Emission Rate (TER) and Target Primary Energy Rate (TPER). At the time of the consultation Notional Dwelling 2 was the preferred specification, which has lower fabric improvements but a greater CO_2 emission and running cost savings compared to Notional Dwelling, achieved through the implementation of solar Photovoltaic (PV) array.

The government's response indicates Notional Dwelling 2 has been selected for Part L1 2021. However, the specification for Notional Dwelling 1 has not gone to waste. The building fabric specification will form the foundation for the Future Homes Standard and Part L 2025 to encourage a high level of fabric standards.

Part L1 2021 Notional Dwelling will be based on a mains gas boiler heating system with Waste Water Heat Recovery System (WWHRS) and solar Photovoltaic (PV) array. This will achieve a 31% CO_2 emission reduction over the current building regulations.

The proposed Future Homes Standard and Part L 2025 specification will be based on a low-carbon heating system (i.e. heat pumps) with the WWHRS and solar PV array removed. This focuses on providing new homes that are well-insulated with a reduced space heating demand in order to reduce the burden on the National Electricity Grid once heat pumps are adopted widespread.

Element	Part L1A 2013	Part L1 2021	Future Homes Standard
U-values (W/m^2K):			
Floor	0.13	0.13	0.11
Walls	0.18	0.18	0.15
Party Walls	0.00	0.00	0.00
Roof	0.13	0.11	0.11
Window	1.4	1.2	0.8
Door (opaque)	1.0	1.0	1.0
Thermal Bridging	0.05	0.05	0.05
Air permeability (@50Pa)	5 m^3/hm^2	5 m^3/hm^2	5 m^3/hm^2
Heating & Hot Water	Gas boiler	Gas boiler	Low-carbon heating
Ventilation	Intermittent extract fans	Intermittent extract fans	Intermittent extract fans
Solar PV Array	No	Yes	No
WWHRS	No	Yes	No

Table 1 Current and proposed Notional Dwelling specification for Part L 2013, 2021 and 2025

Air Permeability

As proposed in the consultation, the benefits from a lower air permeability will be capped at $3m^3/hm^2$ (@50pa) for natural ventilated dwellings; therefore, dwellings that have a lower air permeability will not benefit from energy savings in the SAP calculations and energy efficiency ratings.

Part F of the Building Regulations will require all dwellings to be air pressure tested, including small developments where previously this was not required. This requirement will ensure that all dwellings, regardless of the development size, will meet the air tightness standards.

The way that the airtightness is measured onsite may also be changing. The current and most common method for airtightness testing of a building envelope is through the blower door method at a pressure differential of 50Pa. It is proposed that Pulse testing will be introduced as an approved alternative airtightness testing method which involves applying a pressure pulse to the building envelope and measuring the building volume's pressure response. The Pulse method uses a considerably lower pressure differential of only 4Pa, which is closer to real-life conditions.

An independent approved airtightness testing methodology will be adopted, which will be CIBSE TM23.

Overheating – A Separate Regulation

The overheating criteria within Part L1 (currently Criterion 3) will be removed from Part L1 2021 and separate Building Regulation document will be produced.

The Draft Overheating Regulations indicate two approaches to assessing the risk of summer overheating within new developments, a simplified method and dynamic thermal analysis. It contains a checklist that should be completed and provided to the Building Control Body which details the approach taken and measures applied to reduce the risk of overheating.

The simplified approach outlines the glazing ratios and glazing strategies that should be applied to reduce solar gains. It also provides minimum free areas required to achieve adequate ventilation to remove excess heat.

The dynamic thermal analysis approach follows the requirements within CIBSE TM59:2017 but sets limits on what can be assumed for window opening profiles, including set temperatures that windows are assumed to be open or closed. The regulation will allow openings to be modelled as fully open if both of the following apply:

i. The opening is on the first floor or above and not easily accessible.
ii. The internal temperature exceeds 23°C at 11pm.

It also states that internal blinds and curtains and tree cover should not be accounted for when considering whether the overheating requirement has been met.

Hydrogen

Hydrogen will not yet be included in the SAP methodology as it is yet to be a heating option offered in homes. Further research will be needed to determine the emission factors for hydrogen once in use.

The SAP 10.2 methodology (to be updated to SAP 10.3 for Part L1 2021) will allow for new fuel types to be added to the SAP database between SAP updates if relevant. Therefore, we could see hydrogen being added in a later version of the SAP software should it become a prominent fuel type.

Minimum Performance Standards

Part L1 2021 has been restructured to incorporate requirements within the Domestic Heating Compliance Guide and Domestic Ventilation Compliance Guide to provide a single point of information. The below table presents the current and proposed building services efficiencies for new dwellings:

Application:	Current Standards:	Proposed Standards:
Gas boiler efficiency	88% SEDBUK 2009	92% ErP
Individual heat pump efficiency	SCOP 'D' if ≤12kW, COP 2.5	Heating COP 3.00 Hot Water COP 2.00
Community heating heat pump efficiency	Heating COP 2.50 Hot Water COP 2.00	Heating COP 2.50 Hot Water COP 2.00
Comfort cooling efficiency	EER 2.4 (air cooled) EER 2.5 (water cooled)	SEER 4.00
Lighting	45 lamp lumens per circuit-watt	75 lamp lumens per circuit-watt
MVHR	Efficiency 70% SFP (W/l/s) 1.5	Efficiency 73% SFP (W/l/s) 1.5

Table 2 Current and proposed minimum efficiencies for building services

Similar to the building fabric, it can be seen that the new Part L will also push on the minimum efficiencies of the building services, especially mains gas boilers and heat pumps, to ensure energy consumption is reduced. Space heating will need to be controlled by self-regulating devices in each room, or in a designated heated zone, to ensure heating is only provided when needed.

Flow Temperature

New heating systems should be sized to allow the space heating system to operate effectively, and in a manner which meets the heating needs of the dwelling, at a flow temperature of 55°C or lower. Where it is not feasible to install a space heating system which can operate at this temperature (for example, where there is insufficient space for larger radiators, or the existing distribution system is provided by higher temperature heat from a low carbon district heat network) the space heating system should be designed to the lowest design temperature possible which will still meet the heating needs of the dwelling.

Technology Factors & Combined Heat & Power

The consultation proposed the use of "technology factors" where dwellings are connected to heat networks. This was intended to encourage heat networks in recognition of the ability of heat networks to decarbonise over time. The government's response indicates that the "technology factors" will not be applied to Part L 2021.

Due to the decarbonisation of the National Electricity Grid the use of Combined Heat & Power (CHP) engine is less beneficial in the SAP calculations as the CO_2 emission savings achieved through the generation of onsite electricity no longer outweighs the lower thermal performance of the technology.

However, the government recognise the benefit of using CHP in heat networks and how this technology will help achieve the net zero carbon targets. It is therefore intended to change the emissions and primary energy factors in the SAP 10.2 methodology for heat networks using CHP. The way that CHP engines are to be modelled is undergoing research and development with a separate consultation launched by Department of Business, Energy and Industrial Strategy in early 2021.

Evidence Requirements Update – Get Your Cameras Ready!

There is a well-documented performance gap for buildings that have been designed and constructed to the Building Regulation standards. The new Part L and Future Homes Standard is looking to close the performance gap and will require more robust evidence in order to produce the Energy Performance Certificates (EPCs).

Photographs should be taken for each dwelling on a development as a record during the construction of a property and made available to the energy assessor and Building Control Body. No restrictions are imposed on the persons authorised to take the photographs.

Photographs should be taken at various construction stages for each detail listed below and should be unique to each property:

1) Foundations/substructure and ground floor to indicate thermal conductivity of insulation and quality at
    a) Ground floor perimeter edge insulation
    b) External door threshold
    c) Below damp-proof course on external walls

2) External walls: for each wall type to indicate thermal continuity of insulation, and quality at
    a) Ground floor to wall junction
    b) Structural penetrating elements

3) Roof: for each roof type to indicate thermal continuity of insulation, and quality at
    a) Joist/rafter level
    b) Eaves and gable edges

4) Openings: for each opening type (one image per wall or roof type is sufficient) to indicate thermal continuity of insulation, and quality at
    a) Window positioning in relation to cavity closer or insulation line
    b) External doorset positioning in relation to cavity closer or insulation line

5) Airtightness: additional photos of all details 1-4 to identify airtightness detail (if not included in continuity of insulation image).

6) Building services: for all plant associated with space heating, hot water, ventilation and low or zero carbon technology equipment with or on the building:
    a) Plant/equipment identification label(s) including make/model and serial number
    b) Primary pipework continuity of insulation
    c) Mechanical ventilation ductwork continuity of insulation (for duct sections outside of thermal envelope)

A minimum of one image should be provided per detail type although more than one photograph may be necessary.

Other Notes

- Home User Guide to form part of Part L to ensure occupants are provided with operating and maintenance instructions and non-technical advice on how to operate and maintain the home in a healthy and energy efficient manner. A template will be made available but there is no requirement to follow the layout, format or text used within the example.

- WWHRS efficiencies will be calculated based on shower flow rates.

- Fuel costs will be updated to Department for Building, Energy and Industrial Strategy data and could potentially be updated annually in the next version of SAP (SAP 11 for Part L 2025).

- Marginal CO_2 emission factors are not currently applicable but could be applied in the next version of SAP (SAP 11 for Part L 2025).

- EPC to show Part L standard that the dwelling is assessed to (i.e. Part L1A 2013, Part L1 2021 etc.).