Future Homes Standard and Part L & F Consultation Summary

The consultation version for the Future Homes Standard in relation to energy efficiency and indoor air quality has been released. This includes the long awaited updates to Part L and Part F of the Building Regulations.

The aim of the Future Homes Standard is to make new homes more energy efficient and affordable to run, whilst future proofing them in readiness for low carbon heating systems.

The proposed updates to Part L of the Building Regulation will look at:

- Uplifting the minimum standard of whole life building;
- Improving the minimum insulation standards; and
- Improving the minimum efficiencies of fixed building services.

Homes built to the new Future Home Standard will have 75-80% less carbon dioxide (CO₂) emissions compared to homes built to the current Part L1A 2013 of the Building Regulations (based on an average semi-detached home).

In addition to the above, the new requirements will help improve the as-built performance of new homes as more rigorous testing and supportive evidence is required in order to carry out the energy assessments to Part L of the Building Regulations and produce the Energy Performance Certificates (EPC).

The focus areas of the consultation is to seek views on proposed changes to Part L of the Building Regulations and associated statutory guidance. It seeks to make new homes more energy efficient and future proof them for low carbon heating systems.

Below is a summary of the key changes proposed to Part L1 of the Building Regulations. These are subject to change depending on the consultation which is due to close on 10 January 2020.

Key Changes to Part L of the Building Regulations

Part L will be split into two volumes:

- Volume 1 relates to dwellings
- Volume 2 relates to buildings other than dwellings

Target Rates

It is proposed that Criterion 1 will look at two performance criteria - primary energy as the principal performance metric (measured in kWh/m²/year) and CO₂ emissions (measured in kgCO₂/m²/year) as the secondary performance metric. Meeting the targets within the new Part L will allow the building to be a nearly zero-energy building.
There are currently two options for the notional dwelling specification, which is used to calculate the target primary energy and target emission rates. They are as follows:

- **Option 1** - 20% CO₂ emission reduction compared to the current standard achieved through an enhanced building fabric specification, including triple glazing (also includes mains gas boiler and Waste Water Heat Recovery (WWHR))

- **Option 2** - 31% CO₂ emission reduction compared to the current standard achieved through technologies and slight improvement to the building fabric specification (includes mains gas boiler, WWHR and Photovoltaic (PV) array)

The government’s current preferred option is Option 2. This has higher estimated uplift cost compared to Option 1, but also provides the greatest potential energy saving costs to the household. The estimated uplift costs to build an average semi-detached home to Option 2 is £4,847, and the estimated running cost saving is £257. It is expected that developers will choose less costly ways of meeting the Option 2 standard. Technologies to be used to meet the targets will not be prescribed to give developers the flexibility to innovate and select the most practical and cost-effective solutions.

The Fabric Energy Efficiency (FEE) performance metric will be removed as a set criterion; however, the two options for the notional dwelling will lead to a FEE better than the FEE proposed by the Zero Carbon Hub for energy efficient homes (equivalent to Code for Sustainable Homes Level 5 and Level 6 minimum standards).

**Fuel Factors**

Currently fuel factors are applied for high-carbon fossil fuels; for example, grid electricity has a fuel factor of 1.55 applied to the Target Emission Rate (TER) for space heating and hot water. However, as the SAP 10.1 methodology has demonstrated, grid electricity has a carbon emission factor lower than mains gas. Therefore, the fuel factors are likely going to be removed under the new Part L.

**Householder Affordability**

A new regulation is proposed to ensure that new dwellings are built to be affordable for householders with regards to running costs for heating, hot water and lighting (as per the EPC).
Limiting Parameters for the Building Fabric

The below table presents the current and proposed limiting parameters for the building fabric specification:

<table>
<thead>
<tr>
<th>Element</th>
<th>Current Value:</th>
<th>Proposed Value:</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Walls</td>
<td>0.30 W/m²K</td>
<td>0.26 W/m²K</td>
</tr>
<tr>
<td>Party Walls</td>
<td>0.20 W/m²K</td>
<td>0.20 W/m²K</td>
</tr>
<tr>
<td>Exposed Floors</td>
<td>0.25 W/m²K</td>
<td>0.18 W/m²K</td>
</tr>
<tr>
<td>Roofs</td>
<td>0.20 W/m²K</td>
<td>0.16 W/m²K</td>
</tr>
<tr>
<td>Windows</td>
<td>2.00 W/m²K</td>
<td>1.60 W/m²K</td>
</tr>
<tr>
<td>Roof-lights*</td>
<td>2.00 W/m²K</td>
<td>2.20 W/m²K</td>
</tr>
<tr>
<td>Doors</td>
<td>2.00 W/m²K</td>
<td>1.60 W/m²K</td>
</tr>
<tr>
<td>Air Permeability</td>
<td>10 m³/hm² (@50Pa)</td>
<td>8 m³/hm² (@50Pa)</td>
</tr>
</tbody>
</table>

Table 1. Current and proposed limiting parameters for the building fabric
*Roof-light U-value measured in the horizontal position

It can be seen that the new Part L will push fabric improvements. However, as an improved standard is applied to the notional dwelling, in reality the targets being achieved in design are better than those demonstrated in the above table.

In order to prevent heat loss, the following is recommended to avoid air movement within thermal elements, by either:

a. The insulation layer should be against the air barrier at all points in the building envelope.
b. The space between the air barrier and insulation layer should be filled with solid material.

Air Permeability Rate

It is possible that the new Part F of the Building Regulations will require all dwellings to be air pressure tested. Again, this is something that is currently common practice on a majority of sites.

The air permeability rate will be input at 0.5m³/hm² (@50Pa) increments to reflect the uncertainty of air permeability test results in SAP.

The benefits from a low air permeability will also be capped at 3m³/hm² (@50pa) for natural ventilation; therefore, dwellings that have a lower air permeability will not benefit from energy savings in the SAP calculations and energy efficiency ratings.
Minimum Building Services Efficiencies

It is proposed the information within the Domestic Heating Compliance Guide and Domestic Ventilation Compliance Guide will be incorporated directly into the new Part L document. The below table presents the current and proposed building services efficiencies for new dwellings:

<table>
<thead>
<tr>
<th>Application</th>
<th>Current Standards:</th>
<th>Proposed Standards:</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas boiler efficiency</td>
<td>88% SEDBUK 2009</td>
<td>92% ErP</td>
<td>Consistent with Boiler Plus measures for existing dwellings</td>
</tr>
<tr>
<td>Heat pump efficiency</td>
<td>SCOP ‘D’ if ≤12kW, COP 2.5</td>
<td>Heating SCOP 2.80, Hot Water SCOP 2.00</td>
<td>Consistent with Ecodesign standard</td>
</tr>
<tr>
<td>Comfort cooling efficiency</td>
<td>EER 2.4 (air cooled), EER 2.5 (water cooled)</td>
<td>SEER 3.87</td>
<td>Consistent with Ecodesign standard</td>
</tr>
<tr>
<td>Lighting</td>
<td>45 lamp lumens per circuit-watt</td>
<td>60 lamp lumens per circuit-watt</td>
<td>Uplift to reflect common practice</td>
</tr>
</tbody>
</table>

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 to ensure energy consumption is reduced. It is proposed that space heating will be operated at a low temperature (≤55°C) to future proof new dwellings for low-carbon heat technologies.

The new Part L requires self-regulating devices in each room, or in a designated heated zone, to ensure heating is only provided when needed.

“Technology factors” will be applied where dwellings are connected to heat networks. This is intended to encourage heat networks in recognition of the ability of heat networks to decarbonise over time.

Mechanical Ventilation with Heat Recovery (MVHR) units will require a minimum plate heat exchanger efficiency of 73% and maximum Specific Fan Power (SFP) of 1.5W/l/s. The units will also need to be capable of providing summer bypass.

Where external lighting is present it should have controls to switch luminaires off in response to daylight. If the lamp efficacy is 60 lumens or less then occupancy sensors should also be applied, otherwise manual control is acceptable.

Compliance with Building Regulations and Performance

The current requirements to demonstrate that a dwelling achieves compliance with Part L1A 2013 of the Building Regulations once constructed, is to provide construction status drawings and specifications, air pressure test results, signed checklists (e.g. Accredited Construction Details), installation certificates (e.g. MCS) and a signed statement from the developer confirming the specification used within the assessment.
It is proposed that the evidence required becomes more robust to ensure that what has been included within the assessment reflects what has been installed on site. Therefore, photographic evidence for new dwellings will need to include:

- Insulation levels and insulation product types
- Main and secondary heating systems
- Ventilation system
- Domestic hot water system
- Evidence of LZC technologies and relevant data
- Construction details - one image per junction type would be acceptable

**Overheating in New Dwellings**

The government has responded to a request that a new regulation to stop buildings being built which are prone to overheating is enforced, by committing to consult on a method for reducing overheating risk in new homes. The consultation will address this commitment and include proposals to reduce the risk.

The new Part L goes into further detail when looking at the risk of summer overheating in dwellings. It considers pipework losses and losses from water storage, setting minimum insulation levels that should be achieved. The insulation levels provided for hot water storage are higher than what is currently expected from manufacturers, so these should be easily achievable.

**Key Changes to the SAP 10 Methodology (now SAP 10.1)**

There have been a considerable number of changes made to the SAP methodology. SAP 10 methodology was released in July 2018 to allow designers, developers and energy assessors to review the changes so they could investigate the impact it will have on new projects. SAP version 10.1 was released on 01 October 2019 with the new Part L consultation, which incorporated further updates that could impact the design of new dwellings. The key changes in version 10.1 have been highlighted below:

- Notional dwelling specification has been updated. Two options proposed as outlined above under Part L Target Rates.
- Heat Interface Unit (HIU) database to be added for heat loss. If unknown a value of 1.46kWh/day is to be applied.
- If no cylinder or HIU specified then default heat loss of 1.72kWh/day is applied, which is equivalent to a cylinder volume of 110 litres and a factory insulation thickness of 50mm.
- Fuel prices have been updated. Based on five-year average of predicted values, rather than three-year. Price for electricity has increased since the previous version was released (17.56p/kWh, from 16.55p/kWh). This can lead to worse EPC ratings if electric heating systems are implemented.
- CO₂ emission factors updated. The emission factor for electricity has decreased since the previous version was released (0.136kgCO₂/kWh, from 0.233kgCO₂/kWh). This is now lower than mains gas. An increase in electric generating renewable technologies will be required to meet the onsite CO₂ emission reduction targets.
- Primary energy factors updated. The primary energy factor for electricity has decreased since the previous version was released (1.501kWh/kWh, from 1.738kWh/kWh).
PV array connected to landlord supply can be shared on an area-weighted basis across dwellings in the same building. This has reverted back to the SAP 2012 methodology. However, with the low emission factor for electricity, an increased amount of PV array will be required to meet any onsite CO₂ emission reduction targets if improvements are not made elsewhere.

**Future Home Standard - What will New Dwellings Look Like?**

Based on the proposed changes to the new Part L and Part F, new homes will be designed and built to reduce running costs for the household, particularly with regards to space heating, hot water and lighting. Dwellings will consist of high thermal performance, with higher insulation levels and lower air permeability.

In the Future Homes Standard consultation it states that the Future Homes Standard will have very high fabric standards and suggests that every new home will typically have triple glazing and standards for walls, floors and roofs that reduce heat loss. On top of this low carbon heating systems will be integral to the specification. It is anticipated that Air Source Heat Pumps (ASHPs) will play a major role in delivering low carbon heat for homes built to the Future Homes Standard.

Heat networks will form an important part in the plan for future of low carbon heat. 18% of UK heat will need to come from heat networks by 2050 to meet the targets set out by the Committee on Climate Change (CCC) cost-effectively.

Direct electric heating will play a minor role, as this is expensive to run and if deployed on a large scale will have a significant impact on the National Grid. However, direct electric heating may be appropriate in homes built to high thermal efficiency standards.

It is estimated that an average semi-detached dwelling with a heat pump, WWHR, triple glazing and low U-values will achieve a 75-80% reduction in CO₂ emissions compared to a dwelling built to Part L1A 2013 of the Building Regulations. However, technologies to be used to meet the targets will not be prescribed to give developers the flexibility to innovate and select the most practical and cost-effective solutions in particular circumstances.

**Timeline**

The proposed timeline for the consultation and release of the new Part L, Part F and summer overheating regulations is as follows:

- Consultation ends on 10th January 2020.
- Early/mid 2020 - Publication of new Part L, Part F and summer overheating regulations
- Mid/late 2020 - New Part L, Part F and summer overheating regulations come into force

The Standard Assessment Procedure methodology version 10.1 (SAP 10.1) will be adopted and updated to version 10.2 when the new Part L comes into force to take into account any changes from the consultation.
Transitional Arrangements for 2020 Uplifts

The proposed transition periods are different to previous transition periods, but these have not yet been confirmed.

Where a building notice, initial notice or full plans deposit is submitted to the Building Control Body before the new energy efficiency standards, it is proposed that the transitional arrangements should only apply to individual building on which building work has started within a reasonable period (currently being consulted).

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 provision and so it would need to comply with the latest set of energy efficiency standards.