Future Homes Standard & Future Buildings Standard
REA Members-Briefing

On 20th January 2021, the Ministry for Housing, Communities and Local Government (MHCLG) released its response to the Future Homes Standard, a consultation from 2019 which could see new homes banned from connecting to the fossil fuel gas network. It also released a further consultation, on a Future Buildings Standard, which is open until the 13th April 2021.

Future Homes Standard

High Level Information:

- By 2025, the Future Homes Standard is aimed to deliver homes that are zero-carbon ready.
    - **i.** A standard is intended to follow to ban new homes being built with fossil fuel heating, such as a natural gas boiler.
    - **ii.** These homes will require low-carbon heating and high levels of energy efficiency. Aiming to reduce further retrofitting to enable them to become zero-carbon as the grid continues to decarbonise.
- Local authorities will continue to be able to set energy efficiency requirements that go beyond the Standard.
- There will be an interim uplift in Part L standards that will be introduced prior to the Future Homes Standard. The Government has chosen 'option 2' (it's preferred option, and the tougher) of 'Fabric plus technology' for the interim uplift of L standards. The REA had argued for a reduction of more than 50% in the CO2 emissions from homes under Part L 2021, but the Government has chosen a figure of 31%.
    - i. This is likely to be introduced in December 2021, and will come into effect in June 2022.
- The Government says that the FHS will ensure an average reduction of 75% in CO_2 emissions compared to homes built to current requirements. The consultation asked whether the ambition of the standard should be set at achieving 75-80% less CO_2 emissions than ones built to current Building Regulations requirements. 16% agreed, with the majority, 72%, saying it was too low a reduction in CO_2.
- Most respondents believed the lead in times were not ambitious enough, and would not give the necessary progress towards Net Zero.
- In response to this they have accelerated the programme, and the full technical specification for the future homes' standard will be consulted on in 2023, with legislation tabled in 2024 and implementation in 2025.
- Transitional arrangements for the Part L standards will apply only to individual buildings, rather than site-wide, and giving developers 12 months from when the Regulations come into effect to commence work. Developers will need to submit notice or deposited plans by June 2022 and commence work by June 2023 for transitional arrangements to apply.
- The Government is asking for views on a stricter FEES through the Future Buildings Standard consultation.
- The REA is disappointed that the Government has ignored industry's response that primary energy should not be used as the main metric to measure energy efficiency.

- However, in response to the consultation, the Government has amended the proposals on primary energy. Through Part L 2021 the following four performance metrics will be used:
    i. Primary energy target
    ii. CO_2 emission target
    iii. Fabric energy efficiency target
    iv. Minimum standards for fabric and fixed building services

Heat

- The standard acknowledges that improving energy efficiency alone will not be enough to meet its ambitions, so a low-carbon heat source will also be required. As highlighted below, they believe air-to-water and air-to-air heat pumps will play a major role in this.
- Some consultation responses raised the concern that a move towards electrification would place an additional burden on the electricity grid.
- The Government response recognises that "it is unlikely that there will be a one-size-fits all solution, so multiple technologies will play a role".
    i. To achieve this – "industry will need to develop the necessary supply chains, skills and constructions practices to consistently deliver high quality homes that incorporate low-carbon heat and high levels of energy efficiency.
- They do however outline that, they 'agree with the Committee on Climate Change that there is an opportunity to start to establish a mass market solution for low carbon heating with new buildings'.
    i. They outline electrification is one of the "few proven scalable options for decarbonising heat".
- The document recognises the role for other technologies such as green gas such as hydrogen and biomethane.
- REA would like to see much more emphasis on proven technologies such as biomass heat.

Heat Pumps

- In its consultation, the Government outlined heat pumps and heat networks as the likely technologies to deliver the Future Homes Standard in their view, but asked for views on other low-carbon technologies, such as direct-electric heating.
    i. 70% of respondents agreed heat pumps should play a role in delivering the Future Home Standard – with 6% (including some who agreed on their use), raised concerns, including skills and supply chain issues, the behavioural change requires, as well as concerns regarding noise, vibration and size requirements.
- Under the interim Part L measures, that are due to be introduced in 2021 existing houses will still be allowed to install gas boilers, meaning they anticipate that uptake of heat pumps may be less popular due to the lower cost option being available.
    i. They however believe that once the supply chain and skills issues are improved, it may increase demand.
- Heat Pumps must reach a minimum efficiency of 3.00 (SCOP), compared with the current SCOP D if <12kW/COP2.5. The Part L standard will be 2.80 (SCOP).

Heat Networks

- 26% of respondents agreed heat networks had a role to play in delivering the Future Homes Standard.
- However, 32%, including some who advocated for their use, expressed concern about their use – particularly that the definition was unclear – and there needed to be a greater distinction drawn between local building or site-based commercial networks for dense urban development, and large regional district heating networks.
    i. Most also agreed fossil fuels should be avoided in new heat networks.
- Drawbacks of heat networks included, the efficiency of those networks, and a lack of consumer choice.
- The Government response highlights that heat networks will have an important role to play "and are often an excellent solution for new buildings in towns and cities" – but again, highlights the need for them to exploit larger scale renewable and recovered heat sources such as Energy from Waste, Waste Heat and Heat from Rivers and Mines.
- MHCLG plan to amend SAP Appendix C to more accurately represent the varied sources of recovered heat available for use in heat networks. More detail will be set out in the SAP consultation in early 2021.
- A further industry working group will be set up on heat networks, to look at design, local planning issues and housing development.

Off gas grid for heat

- The Government's response re-establishes its commitment to 'phasing out the installation of how carbon fossil fuel heating in new and existing homes currently off the gas grid during the 2020s, starting with new homes.
    i. To note, this consultation focuses on new homes, so it is unlikely it would take a position in decarbonising the existing stock of off-gas grid properties.
    ii. They do recognise the particular challenges for off-gas grid though, including the rise in fuel bills that may come with electrification, compared with fossil fuel systems.
- On the issue of bio-fuels within SAP, they reiterate that it is technology neutral, and that they consider 'the use of biofuels, such as bioLPG, a potential option in the decarbonisation of existing homes that are currently using high carbon fossil fuels'.
    i. They say that due to limited feedstocks, they could not be widespread in new buildings which are suitable for a heat pump or heat network.
    ii. They raise the concern that if consumers can switch from bioLPG to regular LPG, going against what was intended, it will result in more emissions.
        - This issue will be explored further going forward.

Connected/Smart Technology (Solar, Energy Storage and EV Charging)

- While the Government's response makes little reference to solar PV, EV charging or to home energy storage, the response noted that one of the technologies that garnered the most support in the consultation was solar PV.
- 2021 Part L Standard will specify 40% of ground floor area for solar PV.

- However, there is no indicative specification for the FHS.
- The REA is disappointed that there is no provision outlined for a requirement for home energy storage, nor is there a requirement for a three phase electricity connection, which would facilitate the roll-out of EV charging at home.
- The response identifies that some developers may choose to install solar panels and a gas boiler instead of heat pumps due to the retention of the current Fabric Energy Efficiency Standard (FEES), because the cost reductions in running a home may be greater in certain circumstances. See the Future Buildings Standard Consultation below.

Future Buildings Standard Consultation

High Level Information

- The consultation is the second stage of MHCLG's two-part consultation on proposed changes to Part L (Conservation of Fuel and Power) and Part F (Ventilation) of the Building Regulations, as well as addressing overheating in residential buildings.
    i. It also addresses the future of non-domestic standards through the Future Buildings Standard, which looks at efficiency and heat, amongst other topics.
- Like the Future Homes Standard, it is expected to come into effect in 2025, with interim measures on Part L & F being introduced in the meantime.

Information of relevance to Solar PV / Energy Storage members

Introducing primary energy as a principle metric of energy efficiency

The key area of interest for those with an interest in on-site generation and other clean technologies, is the Government's proposed performance metrics for the interim uplift to the Part L minimum standard for non-domestic buildings, which can be found on pages 33 – 34. The existing 2013 Part L standard sets performance targets for new buildings based on the modelled CO_2 emissions of that building.

There will be three performance metrics, of which: (i) primary energy; (ii) CO2 emissions targets are of relevance.

The Government writes that: '*Primary energy is energy from renewable and non-renewable sources which has not undergone any conversion or transformation process. It is a measure of the total energy used including energy losses from extraction, processing, conversion and transportation. Primary energy is a new measure and is discussed in more detail in the following section*.'

From 2021 the Government proposes to introduce primary energy as the principal metric against which the energy efficiency of new buildings should be assessed, as the basis for the Part L performance target. The Government believes this would enable it to set an energy performance target which prioritises the energy efficiency of the building by driving efficiency in building technological solutions, and the energy efficiency of the building fabric regardless of the heat source.

However, the Government plans to continue using CO2 targets for buildings alongside the primary energy target to encourage low-carbon fuel choices and use of on-site renewable technologies. Further information on the Government's proposals for primary energy can be found in Briefing Note

– Derivation and Use of Primary Energy Factors in SBEM and the draft National Calculation Methodology Modelling Guide - both can be found here. https://www.uk-ncm.org.uk/

Questions for respondents include: is primary energy suitable as the principle performance metric?; Do respondents agree with using CO2 as the secondary performance metric?; whether respondents agree with the approach to calculating CO2 and primary factors.

Connected/'Smart' Technology (Solar, Energy Storage and EV Charging)

Commissioning and Providing Information

The Government proposes to extend the commissioning requirements for new non-domestic buildings to both Building Automation and Control Systems (BACS) and on-site electricity generation systems (See p.51-2, 61-62).

These plans include introducing requirements for when a new system is installed in a new or existing non-domestic building, which will see the overall energy performance of the new system assessed.

Other changes include clearer guidance on requirements in a new dedicated section in *Approved Document L, volume 2: buildings other than dwellings.*

There are also plans to introduce new requirements and associated guidance on sizing and controls for on-site generation (and battery storage) (p 61-62, 117-118). See *Approved document L, volume 2: buildings other than dwellings (*p.63-64) for further information, however the key pieces to be aware of are that:

- where on-site electricity generation is installed it should be appropriately sized for the site and infrastructure.
- If the installation is replacing an existing system, the capacity of the new system should not be smaller than the existing system, except where demonstrable that a smaller system would be more appropriate or effective.
- The document also appears to suggest that the operator should be provided with controls, though there is appears to be a typo which needs clarification.

Fabric Energy Efficiency Standard (FEES)

The Government notes that subject to the outcome of The Future Buildings Standard consultation, the decision to retain the Fabric Energy Efficiency Standard may make it less appealing for some developers to install heat pumps under Part L 2021 in some circumstances, as there will be lower cost savings possible when compared to gas heating. However, the Government believes that a home built under the Option 2 specification with a heat pump will still have a lower capital cost than one built with a gas boiler.

Under the interim Part L 2021 standard, the Government anticipates that householders will pay around £168 per year on their regulated fuel costs in a home with a gas boiler and a solar panel array, or around £369 per year on their energy bills in a home with a heat pump (the energy costs associated with a home with a heat pump are subject to the consultation question in The Future Buildings Standard consultation on the level of the Fabric Energy Efficiency Standard).

Information for Heat members

- The Future Buildings Standard is designed to transition non-domestic buildings to use low-carbon heat sources for heating and hot water.
    - **i.** As with the Future Homes Standard, it is proposed that new buildings be constructed to the standard that will ensure no further work for them to become carbon neutral over time as the electricity grid and heat networks decarbonise.
- A large proportion of low-carbon heat delivered through the standard, will come from the national grid.

Changes to Part L and Part F for new and existing Non-Domestic buildings

- Prior to the Future Buildings Standard being introduced, MHCLG intends to introduce an uplift to Part L and Part F.
    - **i.** The Government's preferred option will deliver a 27% reduction in carbon emissions on average per building, compared to the existing standard.
- It is worth noting, Part L and Part F give an opportunity to raise standards in existing buildings under certain circumstances also, such as during a major refurbishment of an office building.
    - **i.** Due to many non-domestic buildings that exist now still likely to exist in 2050, this is vital to reducing emissions.

Technologies listed to decarbonise heat for non-domestic buildings.

- **Heat Pumps –** Providing both heating and cooling, MHCLG anticipate a role for them in buildings that don't require large volumes of domestic hot water or higher temperatures than they can typically produce.
    - **i.** They note they would be unsuitable for a number of hospitals or hotels, but they do not go onto specifically mention the role biomass could play in these installations. This is something the REA shall be highlighting in their response.
- **Heat Networks –** They see them forming part of the overall plan for non-domestic buildings, particularly in cities and high-density areas.
    - i. It is added that they 'provide a unique opportunity to exploit larger scale, renewable and recovered waste heat sources that cannot be accessed at an individual building level'.
- **Direct Electric Heating –** e.g. electric underfloor heating or panel heaters, whilst having a minor role could be used in a building that has been high energy efficiency.
- **Other technologies mentioned –**
    - i. Hydrogen is mentioned, with some consultation questions focusing on how it could be used.
    - ii. Biofuels are also mentioned as an option.