A Non-Technical Overview of Energy and Carbon Standards for New Buildings

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Introduction

1. This short paper provides a non-technical overview of the way in which Building Regulations, and the planning system more generally, regulate energy and carbon emissions in new buildings. The aim of the paper is to give a high-level understanding of energy and carbon standards to help inform policy decisions that need to be made as we go forward with the Exeter Plan. Whilst the objective is to keep this document non-technical, this is a complex area so necessarily there is a need to set out some of the legislative and historic context first.

Background and Legal Framework

2. Buildings Regulations apply in England when constructing a new building. The Buildings Act (1984) and Building Regulations (2010) set enforcement powers and technical requirements[1].

3. Part L *Conservation of Fuel and Power* within Schedule 1 of the Building Regulations contains 13 specific regulations that cover the energy performance and greenhouse gas emissions (referred to from here as 'carbon') of new and existing buildings. The approved documents are split into two parts with Volume 1 for dwellings and Volume 2 for buildings other than dwellings (non-domestic).

4. For new buildings, Part L represents the minimum acceptable performance standard for operational energy use and carbon emissions. Importantly there are no building regulations covering other lifecycle stages of a building, including the environmental impact of materials, the construction process, maintenance, or end of life impacts.

Why Buildings Use Energy and the Scope of Part L

5. Buildings need energy for a variety of reasons. A primary function of buildings is to provide comfort to its occupants by conditioning internal environmental conditions, for example the temperature. The 'fabric' of a building (walls, windows, roof etc.) forms the boundary between inside and outside, and the specification of the fabric will determine how much energy is lost from the building when it is colder outside. Similarly, the efficiency of the heating system also affects the building's energy needs.

6. Part L covers the fabric of a building and any energy from 'regulated' sources[2], which include any fixed building services (heating, cooling, ventilation and lighting), and any renewable energy generation. These are under the control of developers at the point of build.

[1] The Building Act allows the government to publish 'approved documents' which provide detailed advice on how to meet the Building Regulations. It is these approved documents that are generally being referred to in practice when 'building regulations' are discussed.

[2] Part L does not include 'unregulated' energy from items such as white goods or electrical equipment brought in and used very variably by building occupants.

A Brief History of Part L

7. Prior to 2006, Part L set minimum performance standards individually for fabric and building services items. For example, the roof could be no worse than X and the boiler could be no worse than Y. In 2006 there was a change in method and instead of this 'elemental' approach, buildings have needed to be modelled using standard software called SAP for dwellings and SBEM for non-domestic buildings. This modelling means it is possible to trade-off good performance in one part of the building's specification against less good performance in another.

8. New versions of Part L have reduced energy use and carbon emissions by tightening standards. Since Part L 2006, there have been changes in 2010, 2013, and 2021. The current version is Part L 2021. In 2025 the Government's intention is to introduce a version known as the 'Future Homes Standard'.

9. Figure 1 shows approximated reduction in regulated carbon emissions for dwellings from the various changes to Part L since Part L 2006. These are discussed in more detail in the sections below for the current and future versions of Part L.

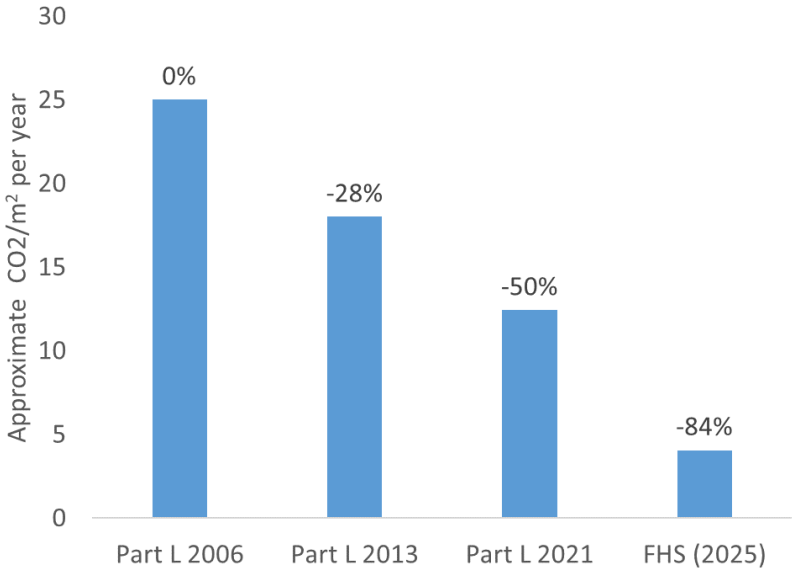

Figure 1: Change in regulated emissions for historic and proposed versions of Part L

The Current Version: Part L 2021

10. Part L includes multiple performance criteria. There are requirements to ensure that all fabric elements and building services meet a minimum standard, as well as a need to undertake onsite testing of the airtightness of finished buildings. The headline requirements relate to the energy and carbon performance of the buildings as determined using the modelling software. There are targets for carbon emissions and primary energy for both dwellings and non-domestic buildings. For dwellings, there is a further target for fabric energy efficiency. The phrase 'fabric first' is often used in planning policy wording. Any developer adhering to Part L could legitimately argue that they are taking a fabric first approach.

11. The carbon target (in $kgCO_2/m^2$ per year) is set to achieve a minimum level of performance. The 2021 version of Part L reduces regulated carbon emissions by 31% for dwellings and 27% for

other buildings compared to the 2013 version. The Government's analysis[3] stated that for an average build mix these changes would add £3,660 to the cost of a dwelling and Homes England research[4] suggests that this is not causing too much concern to developers who are meeting the requirements with fabric enhancements, PV panels, and heat recovery of waste water. Despite this carbon reduction and cost increase, there remain concerns that the uplift was not ambitious enough to prepare the residential sector for the Future Homes Standard.

The Proposed Future Homes Standard 2025

12. The next planned change to Part L will see the introduction of the Future Homes Standard (FHS) in 2025. The FHS consultation targets a 75 to 80% reduction in carbon emissions compared to Part L 2013. Although the final details for the FHS have not been published (as of June 2023), there is the suggestion that connection to the gas grid will no longer be a viable route to compliance, with buildings instead heated using low carbon alternatives such as electrically powered heat pumps. Buildings will be zero carbon ready meaning that in the longer term, no further retrofit work for energy efficiency will be necessary to enable them to become zero-carbon homes as the electricity grid continues to decarbonise. The transition will be challenging for the whole industry and for local government as we seek to ensure housing (including affordable housing) delivery is not slowed and standards in other areas do not drop.

13. The cost of moving to the FHS standard is not known yet, though Homes England estimate[4] it could be approximately £15k to £20k for individual dwelling solutions, or £10k if there are opportunities for communal solutions at a site. There is a risk that the costs of implementing the FHS will feed through to increased prices. However, these changes are needed to help address the climate emergency and the benefits will be felt by residents, as increased energy efficiency reduces the costs of bills and contributes to a cleaner environment.

Part L and The Planning System

14. The Government's planning policies are published in the National Planning Policy Framework (NPPF). First released in 2012 and updated several times since, the most recent being in 2021, it requires the planning of new development to help to reduce carbon emissions, such as through location, orientation, and design.

15. Expressions of national policy also come from several other sources. The Planning and Energy Act 2008 states that a local planning authority in England may include policies imposing reasonable requirements for development to comply with energy efficiency standards that exceed the energy requirements of Building Regulations. The same Act also confirms that those policies included in development plan documents must not be inconsistent with relevant national policies for England.

16. A Written Ministerial Statement (WMS)[5] discusses commencement of amendments to the Planning and Energy Act 2008 in the Deregulation Bill and states that until the amendment is commenced, local planning authorities would be expected to take this statement of the Government's intention into account in applying existing policies and not set conditions with

[3] Department for Levelling Up, Housing & Communities, 2021 changes to the energy efficiency requirements of the Building Regulations for domestic buildings. Final Stage Impact Assessment

[4] Homes England 2023, Home England's Approach to Future Proofed Energy Solutions, Winter Learning Programme.

[5] Planning Update dated 25 March 2015 (HCWS488) (WMS)

requirements above a Code for Sustainable Homes level 4 equivalent[6]. This remains an extant expression of national policy.

17. Section 43 of the Deregulation Act 2015 provides the capability to disapply the power to set energy efficiency standards in England in relation to the construction or adaptation of buildings to provide dwellings or the carrying out of any work on dwellings, but this provision has never been brought into force.

18. Planning Practice Guidance (PPG) refers to the Planning and Energy Act 2008, the Deregulation Act 2015, and the WMS and states that such policies should not be used to set conditions on planning permissions with requirements above the equivalent of the energy requirement of Level 4 of the Code for Sustainable Homes (CSH).

19. Whilst the Government has proposed future changes to the NPPF[7], until such time as these changes are made, we need to be guided by current national policy.

Policy Options for Exeter Plan

20. The Exeter Plan is likely to be adopted in 2025; at a similar time to the proposed introduction of the FHS. Whilst in the past some authorities have sought to challenge the PPG and go beyond energy performance standards in the Building Regulations, as the 2021 Part L and FHS come into force, it is less likely that local authorities will need to set local energy efficiency standards to achieve a shared net zero goal (as carbon emissions from this area will already be reduced significantly and trying to achieve further reduction would be subject to diminishing returns). Furthermore, recent precedent from the Examination of Lancaster's proposed policies suggests that as the carbon target of Part L 2021 is already more ambitious than Level 4 of the CSH, setting energy efficiency standards that exceed the requirements of the Building Regulations in proposed local planning documents would fail to accord with national policy and would not get through Local Plan examination (in this instance Main Modifications were required to the Lancaster Plan to remove this policy).

21. Whilst setting more stringent energy requirements may not be possible, it is important to look at other policy options.

Future Development Standards

22. There is a current expectation that the FHS will require a 75 to 80% reduction in carbon emissions compared to Part L 2013. Experience has shown that both the timescale and level of ambition of changes to Part L can slip. It could be argued that setting a policy locally that commits to the expected carbon reduction of the FHS in 2025 is consistent with national policy. Indeed, similar policy wording has been used in previous planning policy documents in Exeter and has helped to

[6] Approximately 20% above the then Building Regulations across the build mix.

[7] Proposals for future changes to the NPPF include new text stating that significant weight be given to energy efficiency improvements through the adaptation of existing buildings, particularly large non-domestic buildings. However, it is not entirely clear what this may mean in practice. The Government is also currently considering producing National Development Management Policies. It is suggested that these nationally developed standard policies could address current gaps in national policy potentially including carbon reduction in new development through optional technical standards. Consideration is also being given to using local planning to evaluate wider carbon emissions from new development, including those from transport and embodied emissions.

support local low carbon development when national policy has proceeded at a slower pace than expected. A 'FHS backstop' policy could be considered for the coming Exeter Plan.

Prescriptive PV policy

23. Another policy option, which could be argued to be consistent with national policy, is to be prescriptive in regard to how development meets the Building Regulations. An example of a prescriptive policy may require a developer to ensure a roof is covered with solar panels. However, as Part L works by enabling flexibility in meeting its requirements, the upshot is likely to be that the design will be diluted in other building elements as there is no incentive to deliver beyond the minimum carbon target set by Part L. Such a prescriptive policy could for example, risk lower insulation levels in the fabric which would not be viable to retrofit at later a date, unlike PV panels which would be easier to retrofit. Prescriptive policies often have unexpected and unwelcome consequences.

PV ready development

24. Instead of being prescriptive about solutions to meeting Part L, an alternative approach could involve requiring practical steps to be taken at the construction phase of a development to facilitate future energy efficiency improvements. An example of this is a 'PV ready' policy that would require properties to be constructed to allow for later installation of PV, where this is not installed at the point of build. This could involve installing electrical cabling to enable more expensive components (panels, inverters etc.) to be added at a future date, including as an optional purchase upgrade in the case of speculative housing developments[8]. A 'PV ready construction policy' could be considered for Exeter.

Embodied Carbon

25. The proposed 75 to 80% reduction in carbon emissions proposed in the FHS and a likely shift to electric heat pumps using increasingly decarbonised grid electricity are likely to reduce operational carbon emissions in new homes to very low levels. Initial analysis suggests regulated energy operational emissions may only be 3% of upfront emissions for a typical building. Standards to address embodied emissions, for example requiring these emissions to be quantified and potentially setting a limit, would have a more significant impact than further reductions in operational emissions. Developing an Embodied Carbon policy is an area that could be considered further.

Ground mounted PV

26. Emerging evidence suggests that Exeter does have some potential for ground mounted solar arrays (Wind and PV report, SWEEG 2023) A criteria-based policy, indicating where ground mounted PV could be acceptable would help direct potential developers to the most appropriate areas. A ground mounted PV policy could be considered.

Renewable and low carbon energy

27. To achieve Net Zero, it is vital that we increase the use and supply of renewable and low carbon energy. The NFFP identifies the responsibility on all communities to contribute to energy generation from renewable or low carbon sources. A policy that promotes the use of renewable energy and supports retrofitting and small-scale renewable energy generation could be considered.

[8] Whilst ensuring that any such upgrade would be additional to meeting Part L.

Way Forward for the Exeter Plan

28. The Outline Draft Exeter Plan included the following policies:

- **Net Zero Exeter -** Ensures developers will be required to demonstrate how they will contribute to achieving net zero.
- **Local Energy Networks -** Identifies the areas where evidence suggests local energy networks are feasible and viable and requires developments to be constructed to be compatible with proposed energy network (supported by SWEEG's Energy Network Evidence report)
- **Flood Risk** - Setting out how the City Council will consider flood risk.

29. Additional potential policies options (as discussed above) for the Full Draft Exeter Plan:

Future Development Standards – A 'backstop' policy for Future Homes Standards and Future Buildings Standards.

Solar ready development – A policy that would require properties to be constructed to allow for later installation of PV and to encourage retrofitting of homes and employment.

Embodied Carbon – A policy requiring consideration and measurement of embodied carbon.

Ground mounted PV – A criteria-based policy indicating where ground mounted PV might be acceptable (supported by SWEEG's emerging Wind and PV report).

Renewable and low carbon energy - Promoting the use of renewable energy, waste heat and related enabling development (including battery storage) and supports retrofitting and small-scale renewable energy generation (in particular community led schemes).