

8 Policy Testing

8.1 Introduction

Policy and targets for decentralised renewable and low carbon energy should be based on sound evidence of the local opportunities and constraints. They should also be technically feasible and financially viable for the range of developments which are expected to come forward over the period of a Core Strategy.

This chapter describes how policy options for Hertfordshire have been tested for feasibility and viability, in the context of the range of opportunities presented in the Energy Opportunities Plan (Figure 6.2) and the type of development expected in the County's districts and boroughs.

Domestic and non-domestic buildings have been modelled separately due to their different characteristics and the different methodologies used to model energy demand (i.e. SAP for domestic and SBEM for non-domestic). More details are provided in Appendix B.

It should be noted that policies based on domestic CO₂ emission reduction targets will only be valid up until 2016. At this point all homes will need to be 'zero carbon' and this will be enforced through building regulations. However there will still be opportunities for planning policy to set requirements based on maximising appropriate energy opportunities, such as district heating, wind, biomass, etc, and for sustainable design and construction i.e. the use of the Code for Sustainable Homes.

8.2 Policy Options for New development

A range of policy options have been chosen for testing. We have used Building Regulations 2006 as the baseline for regulated CO₂ reduction targets. A summary of the policies tested is provided below with a full set of options provided in Table 8.3.

- Policy 0 corresponds to the Building Regulations 2006 and sets the baseline against which other policy options are compared.
- Policy 1 requires a further 10% reduction in CO₂ emissions over the Building Regulations.
- Policy 2 requires a further 15% reduction in CO₂ emissions over the Building Regulations.
- Policy 3 requires new development to achieve CO₂ emissions reductions one step ahead of the Building Regulations Code Level equivalent.
- Policy 4 requires new development to achieve CO₂ emissions reductions two steps ahead of the Building Regulations Code Level equivalent (but not exceeding 100% reduction in regulated CO₂ emissions compared to PartL 2006 before Building Regulations requirement of Zero Carbon for new developments*).
- Policy 5 requires new development to achieve CO₂ emissions reductions in line with Building Regulations but with a specified contribution from a renewable energy technology.

*It has been assumed that where a policy requires a regulated CO₂ reduction target greater than 70% compared to PartL of BR 2006, allowable solutions in the form of a fund will be available to the property developers. It should be noted that it is not yet clear what form allowable solutions within Building Regulations would take. Therefore assumptions regarding allowable solutions should be reviewed, especially for non-domestic buildings where there is the greatest uncertainty, when there is more clarity over the Building Regulations trajectory.

Where the CO₂ reduction target is greater than 70%, developers would have to achieve a 70% reduction on site (through energy efficiency and renewable or low carbon technologies, including direct link to an off-site heat source. The remaining CO₂ reductions could then be offset by paying money into a fund (options are discussed further in chapter 10).

8.2.1 Policy 0 – Building Regulations Baseline

It should be noted that there is currently some uncertainty over what the Building Regulations requirements will be in the coming years, particularly since a new electoral cycle is due to begin in a few months. Therefore, for the purpose of setting a baseline against which policies can be tested, assumptions about changes to Building Regulations up to 2019 have been made. These assumptions are based on our knowledge about the current proposed Building Regulation trajectory up to 2019.

At the time of writing, PartL of Building Regulations follows CO₂ reduction targets that are in line with Code for Sustainable Homes CO₂ targets. Table 8.1 shows the assumed Building Regulations baseline between 2010 and 2019.

| | Regulated CO ₂ reduction required over PartL 2006 | | | |
|----------------------------|--|------|------------|------------|
| | 2010 | 2013 | 2016 | 2019 |
| Policy 0 (Residential) | 25% | 44% | ZeroCarbon | ZeroCarbon |
| Policy 0 (Non-residential) | 25% | 44% | 70% | ZeroCarbon |

Table 8.1: Assumed Building Regulations baseline between 2010 and 2019

8.2.2 Policy 1 – 10% reduction in CO₂ emissions over Building Regulations

This policy requires new development to achieve a 10% reduction in the remaining regulated CO₂ emissions after meeting Building Regulations.

For example, in 2010 Building Regulations will stipulate a 25% reduction in regulated emissions over PartL 2006. To calculate the 10% reduction, 10% of the remaining 75% of regulated emissions (7.5%) is added to the Building Regulations baseline.

Therefore Policy 1 in 2010 is:

$$\begin{aligned}
 &= 25\% + (10/100) \times (100\% - 25\%) \\
 &= 25\% + (10/100) \times 75\% \\
 &= 25\% + 7.5\% = 32.5\%
 \end{aligned}$$

In 2013, Building Regulations requires a 44% reduction over PartL 2006. The remaining emissions are 100% - 44% = 56%

Therefore Policy 1 in 2013 is

$$= 44\% + (10/100) \times 56\% = 44\% + 5.6\% = 49.6\%$$

In 2016, new residential development will have to be Zero Carbon. At this time, Policy 1 will follow the Building Regulations baseline.

For new non-residential development in 2016, Policy 1 is:

$$= 70\% + (10/100) \times 30\% = 73\%$$

In 2019, new non-residential development will have to be Zero Carbon. At this time, Policy 1 will follow the Building Regulations baseline.

8.2.3 Policy 2 – 15% reduction in CO₂ emissions over Building Regulations

The methodology for specifying this policy is as for Policy 1 above.

For example in 2013, Policy 2 is:

$$= 44\% + (15/100) \times 56\% = 52.4\%$$

8.2.4 Policy 3 – Code +1

The Code mandatory credit ENE1 “Dwelling Emission Rate” is aligned with Building Regulations Part L and the trajectory towards ‘zero carbon’ homes. This is set out in Table 8.2 below.

The Code+1 policy requires new development to achieve a regulated CO₂ emission reduction one Code level above the current Building Regulations.

In 2010, Building Regulations stipulates a 25% reduction in CO₂ emissions over PartL2006. This corresponds with the CO₂ reduction target of CSH Level 3.

Therefore, in 2010 Code+1 policy requires a CO₂ reduction equivalent to the CO₂ reduction target of CSH Level 4.

In 2013, BR is equivalent to the Code Level 4 emissions reduction target. Code+1 policy therefore requires CSH Level 5 CO₂ emission reduction between 2013 and 2016.

The Code+1 policy does not require a CO₂ reduction greater than 100% before BR requires Zero Carbon for new development. When BR requires the Zero Carbon standard, the Code+1 policy falls in line with BR.

| Code Level | Percentage improvement over 2006 Part L | When change to regulations takes place |
|------------|--|--|
| 1 | 10% | |
| 2 | 18% | |
| 3 | 25% | 2010 |
| 4 | 44% | 2013 |
| 5 | 100% (regulated emissions only) | |
| 6 | Net Zero Carbon (includes unregulated energy i.e. appliances, etc) | 2016 |

Table 8.2 – Part L trajectory towards zero carbon, with corresponding Code levels

8.2.5 Policy 4 – Code +2

The policy for specifying this policy is similar to that for Code+1 policy, except that new development needs to achieve a regulated CO₂ emission reduction two Code levels above the current Building Regulations. Therefore, in 2010 Code+2 policy requires a CO₂ reduction equivalent to the CO₂ reduction target of CSH Level 5. From 2013 up to the year that BR requires new development to be Zero Carbon, the Code+2 policy target is a 100% reduction in regulated emissions compared to BR PartL 2006.

8.2.6 Policy 5 – Renewables Mandatory to meet Building Regulations

Policy 5 requires a percentage contribution from on-site renewables to meet BR. In 2010, this is a 10% contribution towards meeting BR. The remaining 15% to reach the necessary 25% CO₂ reduction can come from energy efficiency or other renewable or low carbon energy measures. In 2013, a renewable technology must provide a 20% contribution (remaining 24% from energy efficiency and/or other RLC measures). From 2016, for new residential developments, policy 5 will follow BR. From 2019, for new non-residential developments, policy 5 will follow BR.

| Policy | Policy description | Development type | 2010 | 2013 | 2016 | 2019 |
|----------|----------------------------------|------------------|---|---|---|------------|
| Policy 0 | BR 2006 Baseline | Residential | 25% | 44% | ZeroCarbon | ZeroCarbon |
| Policy 0 | BR 2006 Baseline | Non-residential | 25% | 44% | 70% | ZeroCarbon |
| Policy 1 | BR 2006 +10% | Residential | 32.5% | 49.6% | ZeroCarbon | ZeroCarbon |
| Policy 1 | BR 2006 +10% | Non-residential | 32.5% | 49.6% | 73% | ZeroCarbon |
| Policy 2 | BR 2006 +15% | Residential | 36.25% | 52.4% | ZeroCarbon | ZeroCarbon |
| Policy 2 | BR 2006 +15% | Non-residential | 36.25% | 52.4% | 74.5% | ZeroCarbon |
| Policy 3 | Code +1 (CO ₂ target) | Residential | 44% | 100% | ZeroCarbon | ZeroCarbon |
| Policy 3 | Code +1 (CO ₂ target) | Non-residential | 44% | 100% | 100% | ZeroCarbon |
| Policy 4 | Code +2 (CO ₂ target) | Residential | 100% | 100% | ZeroCarbon | ZeroCarbon |
| Policy 4 | Code +2 (CO ₂ target) | Non-residential | 100% | 100% | 100% | ZeroCarbon |
| Policy 5 | Policy 5 (renewables mandatory) | Residential | 25% (10% from renewables, 15% from any other means) | 44% (20% from renewables, 24% from any other means) | ZeroCarbon | ZeroCarbon |
| Policy 5 | Policy 5 (renewables mandatory) | Non-residential | 25% (10% from renewables, 15% from any other means) | 44% (20% from renewables, 24% from any other means) | 70% (20% from renewables, 50% from any other means) | ZeroCarbon |

Table 8.3 Policy options tested for this study

8.3 Case Studies

The size and type of development proposed are important factors to take into account when considering the level of energy performance that may be feasible and viable. For the purpose of this study, the different policy options have been tested against 17 development scenarios which are based on actual development case studies which were put forward for consideration by the LPAs and represent the range of development which is expected to come forward over the period of the LPAs' Core Strategy period. Additionally, we have suggested several notional case studies of development types/sizes that haven't been represented by the LPA case studies but which are likely to occur in Hertfordshire.

20 development scenarios have been used as case studies and these are briefly described in Table 8.4 below. Please note that where very similar development types and sizes have been provided by LPAs, we have approximated the number of homes/total sqm commercial area to ensure all are captured by a suitable threshold.

It should also be noted that Policy 5 has only been tested for 6 development scenarios as it is considered that the results from these scenarios give a clear indication about the implications of such a Policy. Therefore, Policy 5 was not tested for the remaining development scenarios as it is deemed that there would be no additional benefit to the study.

The results and brief analysis is provided for each in Chapter 9.

| Case Study Ref. | Development Type | Total no. Homes | Total sqm non-Residential | Local Authority or Notional | Policy 5 tested? |
|-----------------|--|-----------------|---------------------------|-----------------------------|------------------|
| 1 | Housing – small (1 house) city infill | 1 | - | Notional | Yes |
| 2 | Housing – small (1 house) rural | 1 | - | Local authority | No |
| 3 | Housing – small (10 flats) city infill | 10 | - | Local authority | Yes |
| 4 | Housing - small (10 flats) rural | 10 | - | Local authority | No |
| 5 | Housing - small (10 houses) rural | 10 | - | Local authority | No |
| 6 | Housing - small (10 houses) City infill | 10 | - | Local authority | No |
| 7 | Housing – medium mixed (50 flats and houses) rural | 50 | - | Local authority | No |
| 8 | Housing – medium mixed (50 flats and houses) urban | 50 | - | Local authority | No |
| 9 | Housing – medium mixed (200-500 flats and houses) urban | 350 | - | Local authority | Yes |
| 10 | Urban office development (100 sqm) | - | 100 | Notional | Yes |
| 11 | Urban office development (1,000 sqm) | - | 1,000 | Notional | No |
| 12 | Office development (approx 8,000 sqm) | - | 7,800 | Local authority | Yes |
| 13 | Medium mixed commercial (approx 4,000 sqm) | - | 3,700 | Local authority | No |
| 14 | Large mixed commercial (approx 35,000 sqm) | - | 35,000 | Local authority | No |
| 15 | Light industrial (100,000 sqm) | - | 100,000 | Local authority | No |
| 16 | Urban retail (approx 11,000 sqm) | - | 11,000 | Local authority | No |
| 17 | Small mixed use - housing, office, school, retail | 400 | 5,000 | Local authority | No |
| 18 | Medium mixed use - housing, retail, commercial | 1,000 | 3,400 | Local authority | No |
| 19 | Medium to Large mixed use – housing, schools, commercial | 2,700 | 58,500 | Local authority | No |
| 20 | Large mixed use - housing, office, industrial, hotel | 12,000 | 194,660 | Local authority | Yes |

Table 8.4: Local authority and notional development type case studies used to test potential policies