

Assessing the implications of
Portsmouth City Council's draft
policy for higher sustainability
standards in new developments

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APPENDIX A - POLICY REVIEW

A1.1 National policy

A number of relevant Planning Policy Statements (PPS) and Planning Policy Guidance (PPG) are listed below in table A1, alongside the key areas of policy guidance relating to climate change and energy use.

Table A1: Planning Policy Statements and Planning Policy Guidance that relate to climate change. Source: Working Draft of Practice Guidance to support the Planning Policy Statement: Planning and Climate Change¹.

Planning Policy Statement	Key policies relating to climate change
PPS1: Delivering Sustainable Development	Address causes and potential impacts of climate change; Reduce energy use; Reduce emissions; Promote renewable energy use; and Location and design of development.
PPS3: Housing	Delivery of well designed homes; Making best use of land; and Encouraging new building technologies to deliver sustainable development.
PPG4: Industrial, Commercial Development and Small Firms ²	Reduce the need to travel; and Location of business development.
PPS6: Planning for Town Centres ³	Reduce the need to travel; Encourage use of public transport; and Facilitate multi-purpose journeys.
PPS7: Sustainable Development in Rural Areas	Protect natural resources; and Provide for sensitive exploitation of renewable energy sources.
PPS9: Biodiversity and Geological Conservation	Account for climate change on distribution of habitats and species, and geomorphologic processes and features.
PPS12: Local Development Frameworks	Act on a precautionary basis to reduce the emissions that cause climate change and to prepare for its impacts.
PPG13: Transport	Reduce the need for travel, especially by

¹ Working Draft of Practice Guidance to support the Planning Policy Statement: Planning and Climate Change: www.erm.com/practiceguidance.

² The Department for Communities and Local Government is currently consulting on new PPS4: planning for Sustainable Economic Development which, when finalised, will replace PPG 4.

³ The Department for Communities and Local Government is currently consulting on proposed changes to PPS 6.



Planning Policy Statement	Key policies relating to climate change
	car, by influencing the location of development, fostering development which encourages walking, cycling or public transport.
PPS22: Renewable Energy	Increased development of renewable energy.
PPS23: Planning and Pollution Control	Planning should reduce greenhouse gas emissions and take account of potential effects of climate change where possible.
PPS25: Development and Flood Risk	Planning policies and decisions should reflect the increased risk of coastal and river flooding as a result of climate change.

Planning Policy Statement 1: Delivering Sustainable Development⁴

In 2005, the Government launched a new strategy for sustainable development entitled 'Securing the Future'. The role of planning in delivering the aims of this strategy was then reflected in Planning Policy Statement 1 (PPS1), which sets out generic policies on how planning should facilitate and promote sustainable development through high quality developments and the efficient use of resources.

The policies set out in the PPS need to be taken into account by regional planning bodies and local planning authorities. The PPS states that:

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Planning Policy Statement 22: Renewable Energy⁵

Planning Policy Statement 22 (PPS22): Renewable Energy was issued in August 2004 and provides a much greater focus on the need to meet national and international targets for the reduction of greenhouse gas emissions. As with PPS1, the policies set out in PPS22 need to be taken into account by regional planning bodies and local planning authorities.

PPS22 states that regional and local planning policies should be designed to promote and encourage, rather than restrict, the development of renewable energy resources. It also permits renewable energy targets at regional and sub-regional levels to be set (within paragraph 8).

⁴ Planning Policy Statement 1: Delivering Sustainable Development: www.communities.gov.uk/planningandbuilding/planning/planningpolicyguidance/planningpolicystatements/planningpolicystatements/pps1/.

⁵ Planning Policy Statement 22: Renewable Energy: www.communities.gov.uk/planningandbuilding/planning/planningpolicyguidance/planningpolicystatements/planningpolicystatements/pps22/.

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Please note that there is currently no recognised definition of undue burden in national policy or guidance. Anecdotal evidence suggests that an increase in costs of over 10% is undue. PPS 22 simply requires that policies “should not be framed in such a way as to place an undue burden on developers”. The issue of cost is currently being looked at as part of the consultation on the definition of zero carbon, however this will only relate to the Code for Sustainable Homes, and not developments incorporating BREEAM standards and/or renewable energy requirements. The government is looking at setting a figure of £ per tonne of carbon within the Code as part of ‘allowable solutions’.

Planning and Climate Change: Supplement to Planning Policy Statement 1⁶

This PPS, issued in December 2007, supplements PPS1 by setting out how planning should contribute to reducing emissions and stabilising climate change, and to take into account the unavoidable consequences.

In order to deliver the Government’s sustainable development objectives, regional and local planning authorities should prepare and manage the delivery of spatial strategies that contribute to delivering the Government’s Climate Change Programme and energy policies.

The PPS specifically requires that local and regional planners:

- Ensure local plans have strong carbon ambitions and targets;
- Help to deliver decentralised renewable and low carbon energy;
- Speed up the shift to renewable and low carbon energy; and
- Create communities that are resilient to the effects of climate change.

The PPS1 supplement does not seek to assemble all national planning policy relevant or applicable to climate change and therefore should be read alongside the other Planning Policy Statements. However, the PPS1 supplement does state that:

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The supplement aims to provide clarity on the relationship between planning policies, the Building Regulations and the Code for Sustainable Homes. These

⁶ Planning and Climate Change: Supplement to Planning Policy Statement 1: www.communities.gov.uk/planningandbuilding/planning/planningpolicyguidance/planningpolicystatements/planningpolicystatements/pPCSclimatechange/.



factors should complement and not duplicate each other and planners should work with developers to encourage the construction of sustainable buildings using the Building Regulations and the Code for Sustainable Homes, rather than designing their own standards.

In addition, Local Development Documents (LDDs) should set policies on the provision of low carbon and renewable energy sources and this provision should be 'significant'. The supplement affirms that Local Planning Authorities should set a target percentage of the energy to be used in new developments to come from decentralised and renewable or low carbon energy sources where viable. Where there are opportunities for a greater use of such resources, planning authorities should set higher development area- or site-specific targets to achieve maximum potential.

Paragraph 26:

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The guidance stipulates that Councils and developers should consider on-site renewables for all new developments and in addition, that they should also assess the potential for connecting developments to neighbouring community heating and power schemes able to serve an entire local community.

The key recommendations outlined in the PPS 1 supplement are outlined in detail within table A2 below.

Table A2: Key recommendations outlined in the PPS 1 supplement.

Paragraph	Topic	PPS 1 supplement text
10	Overarching spatial planning	The PPS1 supplement sets out a number of overarching principles for regional

Paragraph	Topic	PPS 1 supplement text
	principles regarding climate change	<p>planning bodies and all planning authorities that they should apply in decision making about their spatial strategies:</p> <p>"(</p> <p>\$ #</p> <p>-</p> <p>#</p> <p>-</p> <p>#</p> <p>.</p> <p>#</p> <p>!</p> <p>"</p> <p>O * ." / &</p>
11	Moving towards zero carbon homes – the relationship between planning policies, the Building Regulations and the Code for Sustainable Homes	<p>Significantly, this PPS1 supplement sets out the parameters under which the planning system needs to support the delivery of the Government’s timetable for reducing carbon emissions from domestic and non-domestic buildings, as outlined in ‘Building a Greener Future’ leading to zero carbon new homes by 2016 and the Government’s similar ambitions to cut emissions from non-domestic developments.</p> <p>The PPS1 supplement states that:</p> <p>"&</p> <p>.</p> <p>"</p>



Paragraph	Topic	PPS 1 supplement text
18	Setting criteria in Development Plan Documents that go beyond the Regional Spatial Strategy	<p>The PPS1 supplement encourages local authorities to go beyond the guidance of the Regional Spatial Strategy (RSS) where local circumstances are appropriate.</p> <p>“&</p> <p style="text-align: center;">/ & O *</p> <p style="text-align: center;">&&</p> <p style="text-align: center;">”</p>
19, 20	Renewable and low carbon energy generation	<p>Although the PPS1 supplement encourages the use of the Code for Sustainable Homes as a means of specifying standards for new build development, it also provides support for local planning authorities to specify a proportion of renewable and low carbon energy sources in new developments. The PPS1 supplement provides the following guidance on requiring renewable energy technologies:</p> <p>“</p> <p style="text-align: center;">&</p> <p>”</p> <p style="text-align: center;">-</p> <p style="text-align: center;">*</p> <p style="text-align: center;">#</p> <p style="text-align: center;">1</p> <p style="text-align: center;">&& 22</p>

Paragraph	Topic	PPS 1 supplement text
		<p>\$ #</p> <p>3</p> <p>&& 22</p> <p>*</p> <p>1\$ #</p> <p>"</p>
26	<p>Providing an evidence-based understanding of the local feasibility and potential for renewable and low-carbon technologies</p>	<p>The PPS1 supplement states that planning authorities should have an evidence-based understanding of the local feasibility and potential for renewable and low-carbon technologies, including microgeneration, to supply new development in their area.</p> <p>The PPS1 supplement then outlines further guidance on how local planning authorities should specify levels of renewable energy in new development, based upon this evidence.</p> <p>"</p> <p>*)</p> <p>*</p> <p>(</p> <p>\$</p> <p>#</p> <p>%</p> <p>#</p>



Paragraph	Topic	PPS 1 supplement text
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27	Developments connecting to existing decentralised energy supplies	The PPS1 supplement provides guidance for local planning authorities as to how they should identify and promote opportunities for connecting to existing decentralised energy supply systems. " \$ \$ \$ % \$ \$ ".
30	Encouraging the delivery of sustainable buildings	"& '& '(%

Paragraph	Topic	PPS 1 supplement text
		<p>(\$ (# % \$,</p>
32	Focussing on development area- and site-specific opportunities for prescriptive standards; and using the Code for Sustainable Homes to specify standards	<p>The PPS1 supplement provides further guidance as to how and where local authorities should specify standards for new build dwellings that go beyond those set out in the Building Regulations.</p> <p>"% 4 # \$ \$ 5 !% * . 1 . "# # - 6 6 "</p>
33	Setting out requirements in Development Plan Documents (DPD), not	<p>The PSS1 supplement states clearly that:</p> <p>"3) &)</p>



Paragraph	Topic	PPS 1 supplement text
	Supplementary Planning Documents (SPD)	<p style="text-align: center;">\$</p> <p style="text-align: center;">1</p> <p style="text-align: center;">!</p> <p style="text-align: center;">"</p> <p style="text-align: center;">#</p> <p style="text-align: center;">\$</p> <p style="text-align: center;">\$</p> <p style="text-align: center;">* && 7</p> <p style="text-align: right;">#</p> <p style="text-align: right;">"</p>

Further guidance on implementing the policies in the PPS1 supplement is available from CLG. A working draft of this guidance is available from the Environmental Resources Management (ERM) website⁷. CLG's intention is that, following the engagement process, the guidance will be developed into a web-based tool that can be refreshed with emerging practice and examples.

The working draft guidance specifically states that the Council's core strategy

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(Paragraph 1.10).

In addition, the working draft guidance states that,

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⁷ Working Draft of Practice Guidance to support the Planning Policy Statement: Planning and Climate Change: www.erm.com/practiceguidance.

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(Paragraph 3.2).

Finally, in relation to the evidence base required for local planning policy, the Government expects that:

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(Paragraph 3.11).

Planning Policy Statement 3: Housing⁸

Planning Policy Statement 3 states that regional spatial strategies should identify locations for new housing developments that reflect sustainable development principles.

In particular, paragraph 37 of PPS 3 states:

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⁸ Planning Policy Statement 3: Housing:
www.communities.gov.uk/publications/planningandbuilding/pps3housing.



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In addition, these aims should be reflected in Local Development Documents, as stated in paragraph 38:

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Planning Policy Statement 12: Local Spatial Planning

The revised 'Planning Policy Statement 12: Creating strong, safe and prosperous communities through local spatial planning'⁹ was published on 4 June 2008. This revised PPS 12 puts in place the national policy framework for creating Local Development Frameworks (LDFs).

⁹ Planning Policy Statement 12: Creating strong, safe and prosperous communities through local spatial planning:
www.communities.gov.uk/planningandbuilding/planning/regionallocal/localdevelopmentframeworks/pps12/.

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A1.2 Regional policy

Regional planning addresses the links between economic, social and environmental issues and sets a coherent policy framework to guide where and when development should happen across the region. This is through a Regional Spatial Strategy (RSS).

An overview of the draft South East Plan is provided below, highlighting in particular those policies that have links to energy and climate change.

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In relation to sustainable design and construction, the Plan states that:

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Policy CC4 states that:

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The Secretary of State did not accept the regional panel's original recommendation to endorse the accelerated introduction of more demanding standards of building sustainability (through the introduction of standards which exceed Building Regulation standards) on a region-wide basis since this is covered in a national policy context.

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Chapter 9, Natural Resource Management, sets out the South East Plan's policies on a number of the Region's key environmental challenges, including sustainable design and construction, water, energy and flooding.

Key policies relevant to this project have been highlighted below.

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The Secretary of State's proposed changes specifically state:

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The Plan also encourages the development of combined heat and power (CHP) systems for heating and cooling:

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The Plan also encourages the integration of mini and micro-CHP, in all developments, and district heating infrastructure in large-scale mixed-use developments. In addition, the use of biomass fuel should be investigated and promoted where possible.

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The following minimum regional targets for electricity generation from renewable sources should be achieved by the development and use of all appropriate resources and technologies:

Table A3. Minimum regional targets for electricity generation from all renewable sources.

Year/timescale	Installed capacity (MW)	% electricity generation capacity
2010	620	5.5
2016	895	8.0
2020	1,130	10.0
2026	1,750	16.0

The Plan highlights that the renewable energy resources with the greatest potential for electricity generation are offshore and onshore wind, biomass, and solar (PV), while the renewable energy resources with the greatest potential for heat generation are solar (thermal) and biomass.

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Development plans should include policies, and development proposals that as far as practicable, should seek to contribute to the achievement of the following regional and indicative sub-regional targets for land-based renewable energy:

Table A4. Sub-regional renewable energy targets across the South East.

Sub-region	2010 renewable energy target (MW)	2016 renewable energy target (MW)	Renewable champion
Thames Valley and Surrey	140	209	TV Energy
East and West Sussex	57	68	ECSC
Hampshire and Isle of Wight	115	122	Hampshire County Council and Isle of Wight Council
Kent	111	154	Kent Energy Centre

Local Development Documents should encourage the development of renewable energy in order to achieve these regional and sub-regional targets.

The plan recommends that local authorities collaborate and engage with communities, the renewable energy industry and other stakeholders on a sub-regional basis to assist in the achievement of the targets through:



Undertaking more detailed assessments of local potential;
Encouraging small-scale community-based schemes;
Encouraging development of local supply chains, especially for biomass; and
Raising awareness, ownership and understanding of renewable energy.

The South East Plan also states that:

The Climate Change Mitigation and Adaptation Implementation Plan¹⁰ for the Draft South East Plan was prepared on behalf of the South East England Regional Assembly by independent consultants in March 2006. This document does not represent Regional Assembly policy and local authorities are not required to follow the recommendations it makes. However, it sets out the actions that the South East England Regional Assembly would encourage local authorities and other partners to take in order for the South East England region to meet the climate change principles outlined in the draft RSS. The plan offers practical advice and provides examples of good practice.

It therefore represents a general approach and a series of recommendations for tackling climate change through the planning system that have been endorsed by the Regional Assembly. As such it provides a sound evidence base for planning authorities to use to set policies in line with these recommendations.

The plan does not provide recommendations for specific targets but outlines the general priority actions that LPAs will need to consider. Portsmouth City Council should bear in mind that certain aspects of national and regional policy have progressed since the publication of the plan in March 2006.

The plan encourages the following key activities by LPAs:

- Incorporating South East Plan policies into DPDs and SPDs;
- Producing SPDs on sustainable construction;
- Incorporating climate change considerations in to Sustainability Appraisals and SEAs;
- Producing development checklists for new developments;
- Requiring a level of the Code for Sustainable Homes as a mandatory minimum standard for new development;
- Setting minimum energy efficiency targets in DPDs;
- Setting renewable energy targets in DPDs and SPDs;
- Requiring ratings against buildings and energy standards for domestic and non-domestic buildings;
- Designing buildings to increase thermal mass;
- Using the planning system to encourage energy efficiency in existing buildings; and
- Integrating CHP and micro-CHP into new developments.

¹⁰ Climate Change Mitigation and Adaptation Implementation Plan:
www.southeast-ra.gov.uk/southeastplan/plan/march_2006/implementation_plan/climate_change_implementation_plan-300306-v2.pdf.

A1.3 Local policy

Chichester District Council's Interim Statement on Planning and Climate Change

Chichester District Council produced an Interim Statement¹¹ on planning and climate change which interprets the requirements of PPS 1 in light of local circumstances. This will be used by the Council to assist in the consideration of planning applications.

The Council intends to use this Interim Statement until the Local Plan is replaced by the Core Strategy of the Local Development Framework.

The Interim Statement acknowledges the Government's requirement for developers to demonstrate how their proposals for new development comply with the Key Planning Objectives (KPOs) of PPS1, in respect of the following matters:

- Water efficiency;
- Sustainable construction;
- Sustainable energy;
- Reducing the need to travel; and
- Adapting to Climate Change.

The Interim Statement has interpreted these KPOs in light of local circumstances and sets out the criteria that Chichester District Council would expect developments to meet to comply with those objectives (as shown in table A5 and A6).

Table A5: Overview of requirements for small residential applications (1-9 dwellings).

Requirements for small residential applications (1-9 dwellings)
<ol style="list-style-type: none"> 1. Sustainable construction: Code for Sustainable Homes Level 2. 2. Adaptation measures: Surface water; Layout and design; and Landscaping and planting.

Table A6: Overview of requirements for major applications (>10 dwellings).

Requirements for major residential applications (>10 dwellings)
<ol style="list-style-type: none"> 1. Water efficiency: Water standard within Code for Sustainable Homes Level 3 (105 litres/person/day) or equivalent. 2. Sustainable construction: Code for Sustainable Homes Level 2. 3. On-site renewable energy: 10% of the Dwelling Emission Rate (DER) from on-site renewable energy. 4. Reducing the need to travel. 5. Adaptation measures: Surface water; Layout and design;

¹¹ Planning for Climate Change: Advice Note on meeting the criteria of Chichester DC's Interim Statement on Planning and Climate Change and completing the Interim Statement Compliance Form: www.chichester.gov.uk/index.cfm?articleid=9291.



Landscaping and planting; and
Wildlife considerations.

APPENDIX B - STRATEGIC HOUSING LAND AVAILABILITY ASSESSMENT

Portsmouth's draft Strategic Housing Land Availability Assessment¹² (SHLAA), published in November 2008, is a requirement of PPS3 and is designed to demonstrate a flexible supply of land for housing (over a period of 15 years). The SHLAA will be used to form a key component of the evidence base for Portsmouth's emerging Local Development Framework (LDF), as well as supporting the delivery of sufficient land for housing.

The study used the latest available information concerning regional housing targets on which to base its analysis. This includes the proposed change from the Secretary of State for five year phasing of housing delivery in Portsmouth to be removed. Portsmouth's requirement to provide 14,700 homes between 2006 and 2026 now averages out at 735 dwellings per annum.

The study concludes that the Council can meet its total requirements under the draft South East Plan. The Council can provide a robust five-year supply of housing land since sufficient deliverable sites have been identified to deliver housing across Portsmouth in the first five years.

B1.1 Methodology

Since the information on planned and potential development will feed into this project's individual site assessments and renewable energy scenarios, it is important to understand the methodology that was used as part of the SHLAA assessment.

B1.1.1 Determining the sources of sites that were included

As Portsmouth is an entirely urban area, with no greenbelt or large greenfield sites, no specific areas of the city were excluded from being assessed. However, the study did exclude all areas of protected open space, Sites of Importance for Nature Conservation and Sites of Special Scientific Importance.

The following data sources were used as a basis for selecting sites to take forward as part of the SHLAA:

Sites in the planning system:

- Sites with planning permission for residential development (or mixed-use development with a residential element) that are under construction;
- Sites with planning permission for residential development (or mixed-use development with a residential element) at or before 31 March 2007 where development has not commenced;
- Current (undetermined) planning applications for residential development;
- Existing housing and mixed-use allocations and site development briefs;

¹² Draft Strategic Housing Land Availability Assessment:
www.portsmouth.gov.uk/living/10789.html.



Land allocated (or with permission) for employment/industrial/retail or other land uses in the Portsmouth City Local Plan which are no longer required for those uses; and
Sites where planning permission for residential development was refused after 1st April 2002¹³.

Potential housing sites:

Key development areas from the draft Core Strategy 2008;
Sites submitted by developers and agents in the 'call for sites';
National Land Use Database sites;
Vacant and derelict land and buildings (using Council Tax and Non Domestic Rates information);
Surplus public sector land (using the Register of Surplus Public Sector Land and Portsmouth City Council sites);
Sites from the City Council's 2002 Urban Capacity study; and
Pre-application discussions regarding residential development.

Non-residential sites:

A review of land with the potential to be developed for housing but currently in non-residential use also took place. This provided the means to find sites which had not previously been identified as possible sites for housing, yet where residential development could be possible.

All of the above sources of information were brought together and plotted using GIS mapping technology to identify duplications. The identified sites were then taken forward for surveying.

B1.1.2 Surveys

All Portsmouth City Council officers involved in carrying out the surveys were given a site survey pro-forma to record all relevant site information.

Section A of the pro-forma was designed to discount sites quickly that could not feasibly accommodate five dwellings, either due to their size or another fundamental issue which meant that residential would not be an appropriate land use.

Section B of the pro-forma was designed to record information about the context of the site, such as the character of the surrounding area and the height and type of buildings that would be feasible.

Section C of the pro-forma included multiple-choice fields to assess the suitability of the site for housing and any potential constraints to delivery.

Section D of the pro-forma was designed for completion upon return to the office to identify additional constraints on sites.

Once the surveys were complete, the sites which surveyors judged to be able to accommodate five or more dwellings were entered on to a database set up to electronically record all information from the pro-formas. A wide range of suitability criteria were considered to assess the suitability of each site.

These were:

2008 Environment Agency flood zone;
Predicted flood zone in 2115 using climate change projections¹⁴;

¹³ Including such sites enabled officers to evaluate whether the reasons for refusal could be overcome in future applications.

Flood hazard level¹⁵;
 Proximity to an internationally important site for nature conservation;
 Proximity to a site frequented by Brent Geese and the importance of this site to the Geese¹⁶;
 The presence of a Tree Preservation Order on the site;
 The importance of any green space (which is not protected open space) on the site;
 Whether the site lies within a conservation area;
 The presence of any listed buildings on the site;
 The proximity of the site to an air quality management area;
 The distance from the site to the nearest railway station¹⁷;
 The distance from the site to the nearest bus stop;
 The distance from the site to the nearest local centre;
 The distance from the site to the city centre, Southsea town centre or a district centre;
 The distance from the site to the nearest secondary school; and
 The distance from the site to the nearest GP surgery.

B1.1.3 Estimating the housing potential of each site

If a site was deemed suitable for housing, officers carried out a multi-stage desktop exercise to estimate the gross number of units that could be accommodated at the site. The first stage of this exercise used a quantitative methodology to further filter out those sites which were unlikely to be able to yield five dwellings.

Initially, the gross area of each site was amended to reflect the fact that supporting infrastructure and services are necessary in any new development. For very small developments, very little physical infrastructure would be needed on the site. However, as the site size (and thus the dwelling yield) increased, roads, paths and open space would be needed to support new residents. The net developable area calculations reflected this and can be seen in table B1.

Table B1. Formulae used to calculate net developable area.

Site size	Net developable area calculation
Up to 0.4ha	95%
0.4ha to 1.9ha	80%
Greater than 2ha	70%

However this methodology was not used to determine the suggested yield for those sites which were taken forward as part of the SHLAA. Council officers concluded that such a methodology was too crude and that a mock scheme, drawn up on a site-by-site basis, would be a more realistic estimation of the capacity of individual sites.

Sites were examined in the context of their surrounding area in order to visualise the kind of development that should take place there. This was to answer two fundamental questions:

¹⁴ As defined in the Partnership for Urban South Hampshire's Strategic Flood Risk Assessment, which is available at <http://push.atkinsgeospatial.com>.

¹⁵ As defined in the Partnership for Urban South Hampshire's Strategic Flood Risk Assessment, which is available at <http://push.atkinsgeospatial.com>.

¹⁶ Sites and their importance as defined by the Hampshire Brent Goose Strategy 2002.

¹⁷ This and the following five criteria collectively measure the accessibility of sites to transport nodes and local services.



Whether the site should be developed solely for housing or whether a mix of uses would be needed, such as a ground floor retail unit; and Whether the site would be more suitable for flats, houses or a mix.

If the site was deemed more suitable for houses, a possible scheme was sketched based on a 'standard' house as illustrated in figure A1.

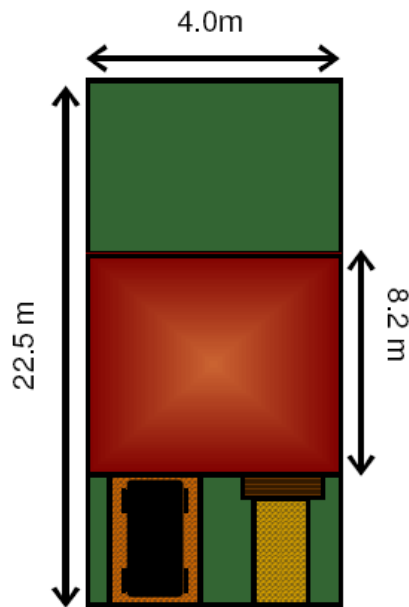


Figure A1. A 'standard' house used to sketch possible schemes on SHLAA sites (please note that this is not to scale). The design was based on the latest housing schemes in the city.

The standard house model that was used results in a building footprint that is 36% of the total area of the plot. This equates to a similar use of space as when yields were based on schemes of flats, demonstrating that housing can be developed at a similar density to flats.

If the site was deemed more suitable for flats, the yield was based on an algorithm. The footprint of the development was deemed to be an average of 40% of the plot size. The remaining space would then be accommodated by landscaping, paths and parking, etc. This footprint size was then multiplied by the number of storeys of residential development it was deemed the site could accommodate. 75% of this total floorspace was then taken forward as space for dwellings, with the remaining 25% accommodating stairs, lifts, cycle and waste storage. The total floorspace for dwellings was then divided by 67 based on the 67m² minimum space standard¹⁸ for a two-bedroom affordable flat in Portsmouth.

In addition, where it was thought that the site could potentially accommodate a mix of houses and flats, the algorithm was altered to suit the location, usually by increasing the footprint of the development in relation to the size of the site.

B1.1.4 Assessing when and whether sites are likely to be developed

The sites were then examined in order to determine when and whether they would be likely to come forward for housing development over the timeframe of the South East Plan (RSS). This stage of the study was critical in determining compliance with PPS3, specifically in relation to a guaranteed five-year supply of housing land.

In order for sites to be included in the first five years' supply, they must be considered to be deliverable. Paragraph 54 of PPS3 sets out that to be considered deliverable, sites should:

- Be suitable – the site offers a suitable location for development now and would contribute to the creation of sustainable, mixed communities;
- Be available – the site is available now; and

¹⁸ Space standards for affordable units in Portsmouth:
<http://www.portsmouth.gov.uk/living/9957.html>

Be achievable – there is a reasonable prospect that housing will be delivered on the site within five years.

Paragraph 56 of PPS3 then goes on to set out the criteria for developable sites, which are expected to come forward after the first five years:

The site should be in a suitable location for housing development;
and

There should be a reasonable prospect that the site is available for, and could be developed, at the point envisaged.

These definitions were used by the Council to assess when and whether sites would be coming forward in order to assemble the city's future housing land supply and ensure that sites are correctly phased.

Given the constrained geography of the city, it is not possible to outline broad locations in the way that is envisaged in the practice guidance.

In this case, a level of site between a 'potential housing site' and a 'broad location' has been identified. This is a 'strategic site', as identified in the draft Portsmouth Plan (2008).

The strategic sites that have been identified in the SHLAA study are:

- Port Solent Boatyards¹⁹;
- Horsea Island;
- Tipner;
- The city centre;
- Somerstown and North Southsea; and
- Fratton Park.

These sites form the key development areas of the draft core strategy which was consulted on between August and October 2008.

B1.1.5 Conclusions

The SHLAA draft report examined how 14,700 additional homes will be achieved throughout the city. Meeting this target will be highly dependent on the levels and development at the strategic sites of Tipner, Port Solent, the Hard and the city centre. Table B2 below indicates how the requirements for the additional 14,700 homes will be met across Portsmouth.

Table B2: Meeting housing targets in Portsmouth.

Source of supply	Period	Total
Completions (across all sites)	April 2006 – April 2007	526
Strategic sites		
Port Solent and North Harbour	2011-2018	2,000
Tipner	2012-2019	1,600
City Centre	2010-2026	2,100
Fratton Park	2011-2016	200
Somerstown	2012-2026	240
Large identified sites		
St Marys Hospital – West Wing	2010-2012	200
Drayton Dairy, Station Road	2010-2012	100

¹⁹ Port Solent Boatyards and Horsea Island (entry below) are treated as one key opportunity area in the draft Core Strategy.



Scottish and Southern Electric, Lower Drayton Lane	2010-2012	100
Other supply		
Large sites with planning permission at 1st April 2007		
Large sites completed during 2007-08	April 2007 – April 2008	243
Large sites under construction at 1st April 2008	2008-2013	2,030
Large sites with planning permission	2008-2013	394
Large sites with planning permission	2013+	77
Small sites with planning permission at 1st April 2007		
Small sites with planning permission (5-9 dwellings)	2007-2010	246
Small sites with planning permission (1-4 dwellings)	2007-2010	200
Strategic Housing Land Availability Assessment identified sites		
Deliverable or developable sites (5+ dwellings)	2008-2026	2,744
Unidentified small sites		
Unidentified small sites (1-4 dwellings)	2008-2010	100
Unidentified small sites (1-4 dwellings)	2010-2026	1,600
Total supply:		14,700

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Please note that:

The identification of potential housing sites, buildings or areas in the SHLAA does not state or imply that the City Council would necessarily grant planning permission for residential development;

The SHLAA has identified suggested yields for each site which have been included in the report. In arriving at these conclusions, officers have used general layouts and mathematical algorithms to arrive at a crude estimation of a site's potential yield based on the information available to officers at the time;

The categorisation of sites in terms of when they may come forward is based on the views of officers and insight from the development industry at the time of the study's preparation. Circumstances or assumptions may change which could impact on a site's development; and

The study has a base date of 1 April 2007 and the findings are only a 'snapshot' of information held at the time the report was compiled.

APPENDIX C - CODE VIABILITY 1

C1.1 Code for Sustainable Homes

There have been only a handful of authoritative studies on the costs associated with up-rating the environmental performance of buildings on the basis of the Code for Sustainable Homes. Many of these studies are now considered out-of-date, but they are included below where relevant.

A Cost Review of the Code for Sustainable Homes (2007)

The first cost review of the Code was undertaken by Cyril Sweett in February 2007. 'A cost review of the Code for Sustainable Homes'²⁰ was commissioned by English Partnerships and the Housing Corporation (now the Homes and Communities Agency – HCA) to assess the implications of moving from EcoHomes 'Very Good' to the Code for Sustainable Homes. The study followed the publication of an initial cost analysis document, which was issued prior to the publication of the first version of the Code's technical guidance document (April 2007).

As a result, cost analysis assumptions were made about the method for achieving some performance standards, based on the summary guidance published in December 2006 and pre-existing EcoHomes standards. A number of these assumptions have since been found to require revision, and further clarification of the credit requirements of the Code has meant that the actual requirements have moved further out of step with the study.

Furthermore the Cyril Sweett study's main function was to consider the potential costs of achieving Code Level 3. Code Level 4 is discussed within the study but only passing mention is made of Code 5. The limitations of this cost review therefore mean that it does not offer sufficient depth to be considered useful as part of this study for Portsmouth City Council, especially as it has now been superseded by the following report.

Cost Analysis of the Code for Sustainable Homes (2008)

'Cost Analysis of the Code for Sustainable Homes'²¹ was commissioned to update the cost analysis undertaken by Cyril Sweett in the light of the finalised technical guidance on the Code. As a comprehensive study its aims are to:

- Provide greater confidence in the analysis of the cost implications of achieving the energy standards for Code levels 4, 5 and 6;
- Provide analysis of the overall cost implications of achieving Code level 6;

²⁰ A cost review of the Code for Sustainable Homes (2007): www.cyrilSweett.com/pdfs/Code%20for%20sustainable%20homes%20cost%20analysis.pdf.

²¹ Cost Analysis of The Code for Sustainable Homes (2008): www.communities.gov.uk/publications/planningandbuilding/codecostanalysis.



Assess the potential for reductions in the cost of meeting different Code levels arising from increased uptake of the key technologies; and
Provide overarching cost information on achieving each level of the Code together with a semi-quantitative evaluation of likely trends in cost.

This comprehensive report goes a long way towards achieving its stated aims. There are, however, also a number of limitations that need to be highlighted, which are summarised below.

The basis for the cost analysis is the Code for Sustainable Homes Technical Guidance document, which is dated September 2007. Since then there have been two revisions of this technical guidance document (in April 2008 and October 2008) with more likely to follow. This is a limitation of the report – i.e. there are 'shifting sands' when calculating Code Level compliance, potentially leading to revised cost differentials.

The costings within the study are based on Q4 2007 pricing levels for homes built by a housing developer with a trading turnover of around 5,000 to 10,000 dwellings per year.

The costs are based upon quotations received from contractors and suppliers, with an adjustment made to reflect bulk purchase arrangements. Estimated costs are assumed to apply equally to different scenarios – small-scale or large-scale - on the basis that the type of contractor used would be similar, as would the design and specification of the individual dwellings.

In many cases this is clearly not going to be the case within Portsmouth. It was highlighted specifically in the project inception meeting of the 4 February 2009 that a significant proportion of the developments within the city are undertaken by small-scale developers. An advantage of this is the fact that quite often smaller developers will work to smaller margins. A disadvantage is that development by a number of small-scale developers will not be able to take advantage of large supply chain discounts.

The cost analysis considers a number of different variables for four different house types, as shown in table C1.

Table C1: Four house types considered in the 'Cost Analysis of the Code for Sustainable Homes'.

House type	Internal floor area (m ²)	Construction cost (£/m ²)	Assumed occupancy
Detached dwellings (DD)	102	£786	4
End terrace / semi (ES)	76	£745	3
Mid-terrace (MT)	76	£745	3
Flat (FL)	60	£1,342	2

To establish a foundation for the study, each of the typical house types is presented as a baseline home (e.g. a Building Regulations-compliant dwelling). Construction costs are given for each house type (£ per m²) along with the expected carbon emissions data (tonnes per year).

Baseline construction assumptions are also set out with regards to the fabric and ventilation specification of Building Regulations-compliant dwellings. Further nominal data with regards to heating, lighting, cooking and appliances is also listed. This information is important as it provides the basis upon which to assess and evaluate the changes necessary to implement the increased Code levels.

Appropriate mixes of these house types are then tested as part of four development scenarios. These represent a range of development sizes, housing mixes and densities.

The development scenarios and their house types and numbers are shown in table C2.



Table C2: Development scenarios considered in the 'Cost Analysis of the Code for Sustainable Homes'.

Development scenario	Density	Site area (dwell/ha)	Dwelling types	Total
Small scale	30	0.3	4DD 2ES 3MT	9
City infill	180	0.1	18FL	18
Market town	50	2	25DD 21ES 21MT 27FL	100
Urban regeneration	160	4.7	30DD 8ES 15MT 697F	750

At present small scale, city infill and urban regeneration would seem particularly applicable to sites within Portsmouth. Analysis under different development scenarios allows for upper and lower bound estimates to be given with some degree of certainty.

It should be recognised that the cost estimates within the report are not definitive. The actual costs incurred will depend on numerous factors including the developer, their supply chain and the circumstances of any specific site (e.g. location, housing mix, etc.). Furthermore there is currently very little established technical or commercial information for some of the performance standards required for the higher levels of the Code.

It should also be noted that the models relate to the construction of the dwellings only. They therefore make no specific allowance for items which would by their nature be site specific such as substructure (other than ground floor slab), below ground and site drainage, site works and site and common infrastructure. The costings also exclude the following:

- Site acquisition costs;
- Fees (other than design fees);
- Party wall awards;
- Building control and planning fees;
- Any section 106 agreements;
- Remediation works;
- Survey works;

Legal fees;
Finance costs;
Loose furniture, fittings and appliances;
Highway works; and
VAT.

The cost analysis then assesses and reports on the financial implications of each of the Code credits at each potential level.

The greatest focus is paid to the Ene1, the DER credit. As detailed in earlier chapters of this report, the aim of this credit is to limit the emissions of carbon dioxide arising from the operation of a dwelling and its services. It is given the most weighting in comparison to other credits.

Hierarchical strategies are modelled for each of the four house types in each of the four development scenarios (where applicable). The hierarchical approach considers improved controls and then improved air tightness and insulation levels before adding in potential renewable energy production solutions.

The information and statistics used to evaluate these strategies is based on the CLG publication 'Research to Assess the Costs and Benefits of the Government's Proposals to Reduce the Carbon Footprint of New Housing Development'²² (September 2008). This research document was commissioned by CLG specifically to consider the costs and benefits of instigating the 'Building A Greener Future' policy of revising the current Part L1A of the Building Regulations in 2010, 2013 and 2016.

The proposed revisions will impose progressively tighter restrictions on the carbon emissions of new dwellings, culminating in a requirement for all new housing to achieve zero carbon status from 2016. The research considers the costs (capital and ongoing) and the benefits (financial and environmental) of achieving this target through a number of alternative policy options.

This research document is an extremely detailed assessment of the potential options for compliance with each of the Code Levels for each of the house types in each of the development scenarios.

Page 89 of the document does acknowledge that small firms are most likely to be involved in the development of sites akin to the small scale and city infill scenarios used in this study. It is likely that small sites may see the highest cost increase due to their reduced scope for realising the benefits of scale in both technology selection and pricing. This is of particular relevance to developers in Portsmouth.

²² Research to Assess the Costs and Benefits of the Government's Proposals to Reduce the Carbon Footprint of New Housing Development:
www.communities.gov.uk/publications/planningandbuilding/housingcarbonfootprint.



The document goes on to state:

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For all of the potential scenarios modelled as part of the research the effect of the jump in costs is clearly shown. This is most significant in the jump from Code Levels 5 to 6.

A note of caution should be sounded with regards to these figures and their applicability to Code Level 6 compliance. The executive summary of the report states:

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The report then considers costs for a number of potential scenarios based on house type, development type, ecological value and flood risk and it presents the following best, medium and worst case scenarios, as shown in table C3.

Table C3: Development scenarios considered in the 'Cost Analysis of the Code for Sustainable Homes', following best, medium and worst case scenarios.

House type	Best case – lowest cost	Medium case – medium cost	Worst case – highest cost
Detached	Market town.	Market town.	Small scale.
End or Mid Terrace	Low ecological value. Low flood risk.	Medium ecological value. Low flood risk.	High ecological value. Medium / high flood risk.
Flat	Urban regeneration. Low ecological value. Low flood risk.	Market town. Medium ecological value. Low flood risk.	City infill. High ecological value. Medium / high flood risk.

In each case costs are attributed to mandatory entry level requirements, the minimum standards for energy and for water and the remaining flexible credits required to achieve the credits threshold at each Code Level.

Proposed policy PCS9

Proposed policy PCS9 is in advance of national sustainable commitments. Additional costs will therefore need to be met to ensure that development is in accordance with PCS9. Simplistically these additional costs can be met in one of four different ways or by a combination of the following:

- Reduced land pricing;
- Increased developer costs;
- Increased purchase costs; and
- Additional grant funding.

Proposed policy PCS9 will have an effect on the development costs for both private dwellings and social housing. Tables C4 and C5 below highlight these changes between 2010 and 2016.

Table C4 highlights the step change between Portsmouth City Council's PCS9 policy in comparison to national policy in terms of the Code for Sustainable Homes.



Table C4: Code Compliance – requirements of Portsmouth City Council and the Housing and Communities Agency (HCA) (formerly the Housing Corporation and English Partnerships).

Year	Change to Code Level			Private	Social
	PCS9	Building a Greener Future (BGF)	Housing Corporation Design Quality Standards (HCDQS)	BGF to PCS9	HCDQS to PCS9
2010	4	None	3	None to 4	3 to 4
2011	4	None	3	None to 4	3 to 4
2012	5	None	4	None to 5	4 to 5
2013	5	None	4	None to 5	4 to 5
2014	5	None	4	None to 5	4 to 5
2015	6	None	6	None to 6	~
2016	6	None	6	None to 6	~

Table C5 highlights the step change between Portsmouth City Council's PCS9 policy in comparison to national policy in terms of carbon reduction.

Table C5: Carbon compliance – requirements of Portsmouth City Council and the Housing and Communities Agency (HCA) (formerly the Housing Corporation and English Partnerships).

Year	% improvement on DER			Private	Social
	PCS9	Building a Greener Future (BGF)	Housing Corporation Design Quality Standards (HCDQS)	BGF to PCS9	HCDQS to PCS9
2010	44%	25%	25%	25% to 44%	25% to 44%
2011	44%	25%	25%	25% to 44%	25% to 44%
2012	100%	25%	44%	25% to 100%	44% to 100%
2013	100%	44%	44%	44% to 100%	44% to 100%
2014	100%	44%	44%	44% to 100%	44% to 100%
2015	Zero carbon	44%	Zero carbon	44% to Zero carbon	~
2016	Zero carbon	Zero carbon	Zero carbon	~	~

Key to tables C4 and C5 above:

- DER Dwelling Emissions Rate (as per Building Regulations ADL1 2006)
- PCS9 Portsmouth City Council's Proposed Sustainable Development Policy
- BGF Building A Greener Future 2007 Policy Statement
- HCDQS Housing Corporation Design and Quality Strategy 2007
- EP/HC English Partnerships and the Housing Corporation



The additional developer costs resulting from the policies outlined above in tables C4 and C5 can be approximated with reference to the CLG costing publication carried out by Cyril Sweett ('A Cost Analysis of the Code for Sustainable Homes'²³ (2008)). This is the most comprehensive document produced to date that considers the financial effect of developing to meet Code for Sustainable Homes requirements. The processes and details of this document have therefore been evaluated as part of this present study.

The basis for the study is four house types built to Building Regulations ADL1 2006 standards, as highlighted in table C6 below.

Table C6: Standard house types compliant with Building Regulations ADL1 2006.

Building type	Detached dwellings	End Terrace /	Mid-Terrace	Flat
		Semi-Detached		
Internal floor area (m ²)	102	76	76	60
Construction cost (£ per m ²)	786	745	745	1,342
Regulated CO ₂ emissions (t per year)	2.34	1.70	1.51	1.35
Unregulated CO ₂ emissions (t per year)	1.38	1.20	1.20	1.00
Overall carbon emissions (t per year)	3.72	2.90	2.71	2.35

Key to table C6:

DER	Dwelling Emissions Rate (as per Building Regulations ADL1 2006)
Regulated emissions	Emissions from sources that contribute to the DER – e.g. space heating, hot water, fixed lighting and ventilation.
Unregulated emissions	Any residual emissions from appliances, cooking, etc. and which are not part of the DER.

The study then considers these four generic house types within four different potential development scenarios to allow the additional costs to be calculated over a range of potential scenarios. The development scenarios included within the study are as per table C7 below.

²³ A Cost Analysis of the Code for Sustainable Homes: www.communities.gov.uk/publications/planningandbuilding/codecostanalysis.

Table C7: Development scenarios for each house type.

Development scenario	Detached dwellings	End Terrace /	Mid-Terrace	Flats
		Semi-Detached		
Small Scale	4	2	3	~
Market Town	25	21	27	27
Urban Regeneration	30	8	15	697
City Infill	~	~	~	18

From this it can be seen that there are 12 different potential dwelling combinations to consider. Many of these have transferable relevance with regards to considering development within Portsmouth. The 12 potential dwellings evaluated in the report are as listed in table C8:

Table C8: Dwelling types for analysis.

Dwelling type	Development type
Detached	Small Scale
Detached	Market Town
Detached	Urban Regeneration
End Terrace / Semi-Detached	Small Scale
End Terrace / Semi-Detached	Market Town
End Terrace / Semi-Detached	Urban Regeneration
Mid-Terrace	Small Scale
Mid-Terrace	Market Town
Mid-Terrace	Urban Regeneration
Flat	City Infill
Flat	Market Town



Flat	Urban Regeneration
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From the original matrices given in tables C4 and C5 it can be seen that there is a requirement for additional development costs for both carbon compliance and for the other elements of the Code. This report evaluates these separately so that the effect of each can be viewed independently.

C1.1.1 Carbon compliance

Based on data taken from the Cyril Sweett report it is possible to produce 'baseline' compliance figures and costings based on 2008 levels for each of the 12 dwelling types for analysis. Tables C9 to C12 define these baseline levels:

Table C9: 25% (Code 3 equivalent) improvement on DER.

Dwelling type	Development scenario	Energy efficiency & assumed technology	Cumulative additional cost per m ² (2008)	Cumulative additional cost (%)	Max CO ₂ emissions (t / year)	Cumulative improvement in CO ₂ emissions (%)
Detached	Small Scale	SHW	£38	4.88%	3.14	15.73%
Detached	Market Town	SHW	£38	4.88%	3.14	15.73%
Detached	Urban Regeneration	PV	£54	6.91%	3.14	15.73%
End Terrace / Semi-Detached	Small Scale	SHW	£52	6.92%	2.48	14.66%
End Terrace / Semi-Detached	Market Town	SHW	£49	6.52%	2.48	14.66%
End Terrace / Semi-Detached	Urban Regeneration	PV	£53	7.10%	2.48	14.66%
Mid-Terrace	Small Scale	SHW	£52	6.92%	2.33	13.93%
Mid-Terrace	Market Town	SHW	£49	6.52%	2.33	13.93%
Mid-Terrace	Urban Regeneration	PV	£47	6.32%	2.33	13.93%
Flat	City Infill	PV	£44	3.26%	2.01	14.36%
Flat	Market Town	PV	£44	3.26%	2.01	14.36%
Flat	Urban Regeneration	PV	£44	3.26%	2.01	14.36%

Table C10: 44% (Code 4 equivalent) improvement on DER.

Dwelling type	Development scenario	Energy efficiency & assumed technology	Cumulative additional cost per m ² (2008)	Cumulative additional cost (%)	Max CO ₂ emissions (t / year)	Cumulative improvement in CO ₂ emissions (%)
Detached	Small Scale	above + PV	£107	13.61%	2.69	27.68%
Detached	Market Town	above + Biomass	£97	12.31%	2.69	27.68%
Detached	Urban Regeneration	above + Biomass	£81	10.26%	2.69	27.68%
End Terrace / Semi-Detached	Small Scale	above + Biomass	£77	10.39%	2.15	26.03%
End Terrace / Semi-Detached	Market Town	above + Biomass	£94	12.57%	2.15	26.03%
End Terrace / Semi-Detached	Urban Regeneration	above + Biomass	£78	10.47%	2.15	26.03%
Mid-Terrace	Small Scale	above + Biomass	£68	9.07%	2.05	24.52%
Mid-Terrace	Market Town	above + Biomass	£81	10.93%	2.05	24.52%
Mid-Terrace	Urban Regeneration	above + Biomass	£68	9.11%	2.05	24.52%
Flat	City Infill	more PV	£84	6.28%	1.76	25.28%
Flat	Market Town	above + Biomass	£84	6.28%	1.76	25.28%
Flat	Urban Regeneration	above + Biomass	£80	5.94%	1.76	25.28%

Table C11: 100% (Code 5 equivalent) improvement on DER.

Dwelling type	Development scenario	Energy efficiency & assumed technology	Cumulative additional cost per m ² (2008)	Cumulative additional cost (%)	Max CO ₂ emissions (t / year)	Cumulative improvement in CO ₂ emissions (%)
Detached	Small Scale	above + Biomass	£219	27.90%	1.38	62.90%
Detached	Market Town	above + CHP	£168	21.37%	1.38	62.90%
Detached	Urban Regeneration	above + CHP	£140	17.78%	1.38	62.90%
End Terrace / Semi-Detached	Small Scale	above + PV	£175	23.48%	1.20	58.62%
End Terrace / Semi-Detached	Market Town	above + CHP	£163	21.82%	1.20	58.62%



End Terrace / Semi-Detached	Urban Regeneration	above + CHP	£135	18.15%	1.20	58.62%
Mid-Terrace	Small Scale	above + PV	£157	21.08%	1.20	55.72%
Mid-Terrace	Market Town	above + CHP	£141	18.97%	1.20	55.72%
Mid-Terrace	Urban Regeneration	above + CHP	£118	15.79%	1.20	55.72%
Flat	City Infill	above + Biomass	£201	14.97%	1.00	57.45%
Flat	Market Town	above + CHP	£166	12.37%	1.00	57.45%
Flat	Urban Regeneration	above + CHP	£138	10.29%	1.00	57.45%

Table C12: Zero carbon (Code 6 equivalent)

Dwelling type	Development scenario	Energy efficiency & assumed technology	Cumulative additional cost per m ² (2008)	Cumulative additional cost (%)	Max CO ₂ emissions (t / year)	Cumulative improvement in CO ₂ emissions (%)
Detached	Small Scale	More of the above	£394	50.18%	0.00	100.00%
Detached	Market Town	above + PV	£321	40.85%	0.00	100.00%
Detached	Urban Regeneration	above + PV	£305	38.82%	0.00	100.00%
End Terrace / Semi-Detached	Small Scale	More of the above	£387	51.91%	0.00	100.00%
End Terrace / Semi-Detached	Market Town	above + PV	£327	43.84%	0.00	100.00%
End Terrace / Semi-Detached	Urban Regeneration	above + PV	£311	41.74%	0.00	100.00%
Mid-Terrace	Small Scale	More of the above	£384	51.52%	0.00	100.00%
Mid-Terrace	Market Town	above + PV	£325	43.62%	0.00	100.00%
Mid-Terrace	Urban Regeneration	above + PV	£310	41.63%	0.00	100.00%
Flat	City Infill	above + CHP	£307	22.89%	0.00	100.00%
Flat	Market Town	above + PV	£317	23.59%	0.00	100.00%
Flat	Urban Regeneration	above + PV	£280	20.83%	0.00	100.00%

Key to tables C9 – C12:

PV	Photovoltaic
CHP	Combined Heat and Power
SHW	Solar hot water
Regulated emissions	Emissions from sources that contribute to the DER – e.g. space heating, hot water, fixed lighting and ventilation
Unregulated emissions	Any residual emissions from appliances, cooking, etc. and which are not part of the DER.

It is important to note the following assumptions from these 'baseline' compliance levels:

A 25% improvement on DER only results in an overall 15% or so reduction in actual emissions (similar shortfalls also happen at the 44% and 100% levels);

Tables C9 to C12 assume no wind generation. If wind generation was included as part of the mix of solutions then the compliant costs could be reduced significantly; and

In this instance the costs associated with 'zero carbon' assume that of the generation is to be on-site or physically connected by a private wire connection. The definition is currently out to consultation and is likely to be relaxed considerably. The costs of achieving 'zero carbon' will therefore be reduced significantly.

From table C4 it can be seen that there are four different upgrade scenarios to be considered for compliance with proposed policy PCS9. These upgrade scenarios are detailed in tables C13 to C16.

Table C13: 25% (Code 3 equivalent) to 44% (Code 4 equivalent).

Dwelling type	Development scenario	Additional costs per m ² (2008)	Additional costs (%)	Additional costs per dwelling	Dwelling emissions CO ₂ savings (t / yr)	Cost per tonne of CO ₂ saved / year
Detached	Small Scale	£69	8.32%	£6,998	0.44	£15,740
Detached	Market Town	£58	7.08%	£5,952	0.44	£13,387
Detached	Urban Regeneration	£26	3.14%	£2,687	0.44	£6,044
End Terrace / Semi-Detached	Small Scale	£26	3.24%	£1,964	0.33	£5,955
End Terrace / Semi-Detached	Market Town	£45	5.68%	£3,423	0.33	£10,379
End Terrace / Semi-Detached	Urban Regeneration	£25	3.15%	£1,910	0.33	£5,791
Mid-Terrace	Small Scale	£16	2.01%	£1,217	0.29	£4,242
Mid-Terrace	Market Town	£33	4.14%	£2,495	0.29	£8,696
Mid-Terrace	Urban Regeneration	£21	2.62%	£1,575	0.29	£5,490



Flat	City Infill	£41	2.93%	£2,432	0.26	£9,481
Flat	Market Town	£41	2.93%	£2,432	0.26	£9,481
Flat	Urban Regeneration	£36	2.60%	£2,160	0.26	£8,421

Table C14: 25% (Code 3 equivalent) to 100% (Code 5 equivalent).

Dwelling type	Development scenario	Additional costs per m ² (2008)	Additional costs (%)	Additional costs per dwelling	Dwelling emissions CO ₂ savings (t / yr)	Cost per tonne of CO ₂ saved / year
Detached	Small Scale	£181	21.94%	£18,451	1.76	£10,513
Detached	Market Town	£130	15.72%	£13,216	1.76	£7,530
Detached	Urban Regeneration	£85	10.17%	£8,718	1.76	£4,968
End Terrace / Semi-Detached	Small Scale	£123	15.49%	£9,376	1.28	£7,354
End Terrace / Semi-Detached	Market Town	£114	14.36%	£8,661	1.28	£6,793
End Terrace / Semi-Detached	Urban Regeneration	£82	10.32%	£6,258	1.28	£4,908
Mid-Terrace	Small Scale	£105	13.24%	£8,017	1.13	£7,079
Mid-Terrace	Market Town	£93	11.69%	£7,050	1.13	£6,225
Mid-Terrace	Urban Regeneration	£70	8.90%	£5,357	1.13	£4,730
Flat	City Infill	£157	11.35%	£9,433	1.01	£9,317
Flat	Market Town	£122	8.83%	£7,340	1.01	£7,249
Flat	Urban Regeneration	£94	6.82%	£5,667	1.01	£5,597

Table C15: 44% (Code 4 equivalent) to 100% (Code 5 equivalent).

Dwelling type	Development scenario	Additional costs per m ² (2008)	Additional costs (%)	Additional costs per dwelling	Dwelling emissions CO ₂ savings (t / yr)	Cost per tonne of CO ₂ saved / year
Detached	Small Scale	£112	12.57%	£11,453	1.31	£8,740
Detached	Market Town	£71	8.07%	£7,264	1.31	£5,543
Detached	Urban Regeneration	£59	6.82%	£6,031	1.31	£4,602

End Terrace / Semi-Detached	Small Scale	£98	11.86%	£7,412	0.95	£7,842
End Terrace / Semi-Detached	Market Town	£69	8.22%	£5,238	0.95	£5,542
End Terrace / Semi-Detached	Urban Regeneration	£57	6.95%	£4,348	0.95	£4,600
Mid-Terrace	Small Scale	£89	11.01%	£6,800	0.85	£8,042
Mid-Terrace	Market Town	£60	7.25%	£4,555	0.85	£5,387
Mid-Terrace	Urban Regeneration	£50	6.12%	£3,782	0.85	£4,473
Flat	City Infill	£117	8.18%	£7,001	0.76	£9,261
Flat	Market Town	£82	5.74%	£4,908	0.76	£6,492
Flat	Urban Regeneration	£58	4.11%	£3,507	0.76	£4,639

Table C16: 44% (Code 4 equivalent) to 'Zero carbon' (Code 6 equivalent).

Dwelling type	Development scenario	Additional costs per m ² (2008)	Additional costs (%)	Additional costs per dwelling	Dwelling emissions CO ₂ savings (t / yr)	Cost per tonne of CO ₂ saved / year
Detached	Small Scale	£287	32.18%	£29,314	2.69	£10,896
Detached	Market Town	£224	25.42%	£22,884	2.69	£8,506
Detached	Urban Regeneration	£225	25.91%	£22,902	2.69	£8,512
End Terrace / Semi-Detached	Small Scale	£309	37.62%	£23,513	2.15	£10,961
End Terrace / Semi-Detached	Market Town	£233	27.78%	£17,707	2.15	£8,254
End Terrace / Semi-Detached	Urban Regeneration	£233	28.30%	£17,701	2.15	£8,251
Mid-Terrace	Small Scale	£316	38.93%	£24,039	2.05	£11,752
Mid-Terrace	Market Town	£244	29.47%	£18,509	2.05	£9,048
Mid-Terrace	Urban Regeneration	£242	29.81%	£18,413	2.05	£9,001
Flat	City Infill	£223	15.63%	£13,376	1.76	£7,617
Flat	Market Town	£232	16.29%	£13,942	1.76	£7,940
Flat	Urban Regeneration	£200	14.06%	£11,993	1.76	£6,830



Tables C13 to C16 highlight that the largest 'jump' in compliance is to the 'zero carbon' level, which incidentally also results in the largest financial burden to developers.

As previously discussed the Cyril Sweett report identifies a number of cost reductions over the coming years. These relate to improvements in technology and corresponding cheaper costs, learning rates of the inclusion of the technologies and building methods generally, and economies of scale as the higher rated dwellings start to be constructed in greater volumes. A summary of these potential reductions is given in Table C17:

Table C17: Anticipated reductions in energy compliance costs over time.

Year	Code 3	Code 4	Code 5	Code 6
2010	3%	3%	3%	15%
2011	4%	4%	5%	17%
2012	5%	5%	7%	19%
2013	5%	6%	8%	21%
2014	6%	8%	10%	23%
2015	7%	9%	12%	24%
2016	8%	10%	14%	26%

There are a number of caveats to table C17:

These figures are based on an assumed volume of housing that is not currently being achieved across England or Portsmouth;
and

This table is based on the full cost of on-site generation / private wire definition of 'zero carbon'.

Table C4 details the anticipated timeframe of the upgrade to comply with the proposed policy PCS9. Using this and the information in tables C9 to C16 as a basis, it is possible to confirm in each year between 2010 and 2015 the effect of PCS9 on the development costs of each of the nominal 12 dwelling types listed in table C8. The following tables confirm these values and take into account the potential reductions considered in table C17 (based on 2008 costing levels). Please note that there is no need to produce a table for 2016 since it is planned that all dwellings will reach 'zero carbon' at this time.

Table C18: 2010 - 25% to 44% (Code 3 to Code 4) for all dwellings.

Dwelling type	Development scenario	Additional costs per m ² (2008)	Additional costs (%)	Additional costs per dwelling	Dwelling emissions CO ₂ savings (t / yr)	Cost per tonne of CO ₂ saved / year
Detached	Small Scale	£67	8.32%	£6,788	0.44	£15,268
Detached	Market Town	£57	7.08%	£5,773	0.44	£12,986
Detached	Urban Regeneration	£26	3.14%	£2,606	0.44	£5,862
End Terrace / Semi-Detached	Small Scale	£25	3.24%	£1,905	0.33	£5,776
End Terrace / Semi-Detached	Market Town	£44	5.68%	£3,320	0.33	£10,068
End Terrace / Semi-Detached	Urban Regeneration	£24	3.15%	£1,853	0.33	£5,618
Mid-Terrace	Small Scale	£16	2.01%	£1,180	0.29	£4,115
Mid-Terrace	Market Town	£32	4.14%	£2,420	0.29	£8,436
Mid-Terrace	Urban Regeneration	£20	2.62%	£1,528	0.29	£5,325
Flat	City Infill	£39	2.93%	£2,359	0.26	£9,197
Flat	Market Town	£39	2.93%	£2,359	0.26	£9,197
Flat	Urban Regeneration	£35	2.60%	£2,095	0.26	£8,168

Table C19: 2011 - 25% to 44% (Code 3 to Code 4) for all dwellings.

Dwelling type	Development scenario	Additional costs per m ² (2008)	Additional costs (%)	Additional costs per dwelling	Dwelling emissions CO ₂ savings (t / yr)	Cost per tonne of CO ₂ saved / year
Detached	Small Scale	£66	8.32%	£6,718	0.44	£15,110
Detached	Market Town	£56	7.08%	£5,714	0.44	£12,852
Detached	Urban Regeneration	£25	3.14%	£2,580	0.44	£5,802
End Terrace / Semi-Detached	Small Scale	£25	3.24%	£1,885	0.33	£5,717
End Terrace / Semi-Detached	Market Town	£43	5.68%	£3,286	0.33	£9,964
End Terrace / Semi-Detached	Urban Regeneration	£24	3.15%	£1,834	0.33	£5,560



Mid-Terrace	Small Scale	£15	2.01%	£1,168	0.29	£4,072
Mid-Terrace	Market Town	£32	4.14%	£2,395	0.29	£8,349
Mid-Terrace	Urban Regeneration	£20	2.62%	£1,512	0.29	£5,270
Flat	City Infill	£39	2.93%	£2,335	0.26	£9,102
Flat	Market Town	£39	2.93%	£2,335	0.26	£9,102
Flat	Urban Regeneration	£35	2.60%	£2,074	0.26	£8,084

Table C20: 2012 - 25% to 100% (Code 3 to Code 5) for privately funded dwellings.

Dwelling type	Development scenario	Additional costs per m ² (2008)	Additional costs (%)	Additional costs per dwelling	Dwelling emissions CO ₂ savings (t / yr)	Cost per tonne of CO ₂ saved / year
Detached	Small Scale	£167	21.94%	£17,081	1.76	£9,733
Detached	Market Town	£120	15.72%	£12,213	1.76	£6,959
Detached	Urban Regeneration	£78	10.17%	£7,997	1.76	£4,557
End Terrace / Semi-Detached	Small Scale	£114	15.49%	£8,641	1.28	£6,778
End Terrace / Semi-Detached	Market Town	£105	14.36%	£7,981	1.28	£6,260
End Terrace / Semi-Detached	Urban Regeneration	£76	10.32%	£5,740	1.28	£4,502
Mid-Terrace	Small Scale	£97	13.24%	£7,377	1.13	£6,514
Mid-Terrace	Market Town	£85	11.69%	£6,483	1.13	£5,724
Mid-Terrace	Urban Regeneration	£65	8.90%	£4,910	1.13	£4,336
Flat	City Infill	£145	11.35%	£8,720	1.01	£8,613
Flat	Market Town	£113	8.83%	£6,774	1.01	£6,690
Flat	Urban Regeneration	£87	6.82%	£5,218	1.01	£5,153

Table C21: 2012 - 44% to 100% (Code 4 to Code 5) for publicly funded dwellings.

Dwelling type	Development scenario	Additional costs per m ² (2008)	Additional costs (%)	Additional costs per dwelling	Dwelling emissions CO ₂ savings (t / yr)	Cost per tonne of CO ₂ saved / year
Detached	Small Scale	£102	12.57%	£10,433	1.31	£7,962
Detached	Market Town	£64	8.07%	£6,558	1.31	£5,005
Detached	Urban Regeneration	£53	6.82%	£5,444	1.31	£4,155
End Terrace / Semi-Detached	Small Scale	£89	11.86%	£6,776	0.95	£7,168
End Terrace / Semi-Detached	Market Town	£62	8.22%	£4,729	0.95	£5,003
End Terrace / Semi-Detached	Urban Regeneration	£52	6.95%	£3,925	0.95	£4,153
Mid-Terrace	Small Scale	£82	11.01%	£6,221	0.85	£7,357
Mid-Terrace	Market Town	£54	7.25%	£4,112	0.85	£4,863
Mid-Terrace	Urban Regeneration	£45	6.12%	£3,414	0.85	£4,038
Flat	City Infill	£107	8.18%	£6,410	0.76	£8,479
Flat	Market Town	£74	5.74%	£4,463	0.76	£5,904
Flat	Urban Regeneration	£53	4.11%	£3,166	0.76	£4,188

Table C22: 2013 - 44% to 100% (Code 4 to Code 5) for all dwellings.

Dwelling type	Development scenario	Additional costs per m ² (2008)	Additional costs (%)	Additional costs per dwelling	Dwelling emissions CO ₂ savings (t / yr)	Cost per tonne of CO ₂ saved / year
Detached	Small Scale	£101	12.57%	£10,318	1.31	£7,874
Detached	Market Town	£64	8.07%	£6,486	1.31	£4,949
Detached	Urban Regeneration	£53	6.82%	£5,384	1.31	£4,109
End Terrace / Semi-Detached	Small Scale	£88	11.86%	£6,701	0.95	£7,090
End Terrace / Semi-Detached	Market Town	£62	8.22%	£4,677	0.95	£4,948
End Terrace / Semi-Detached	Urban Regeneration	£51	6.95%	£3,882	0.95	£4,107



Mid-Terrace	Small Scale	£81	11.01%	£6,153	0.85	£7,277
Mid-Terrace	Market Town	£54	7.25%	£4,067	0.85	£4,809
Mid-Terrace	Urban Regeneration	£44	6.12%	£3,376	0.85	£3,993
Flat	City Infill	£106	8.18%	£6,340	0.76	£8,386
Flat	Market Town	£74	5.74%	£4,414	0.76	£5,839
Flat	Urban Regeneration	£52	4.11%	£3,131	0.76	£4,141

Table C23: 2014 - 44% to 100% (Code 4 to Code 5) for all dwellings.

Dwelling type	Development scenario	Additional costs per m ² (2008)	Additional costs (%)	Additional costs per dwelling	Dwelling emissions CO ₂ savings (t / yr)	Cost per tonne of CO ₂ saved / year
Detached	Small Scale	£99	12.57%	£10,089	1.31	£7,699
Detached	Market Town	£62	8.07%	£6,340	1.31	£4,838
Detached	Urban Regeneration	£52	6.82%	£5,263	1.31	£4,017
End Terrace / Semi-Detached	Small Scale	£86	11.86%	£6,553	0.95	£6,933
End Terrace / Semi-Detached	Market Town	£60	8.22%	£4,572	0.95	£4,837
End Terrace / Semi-Detached	Urban Regeneration	£50	6.95%	£3,795	0.95	£4,015
Mid-Terrace	Small Scale	£79	11.01%	£6,017	0.85	£7,116
Mid-Terrace	Market Town	£52	7.25%	£3,976	0.85	£4,702
Mid-Terrace	Urban Regeneration	£43	6.12%	£3,301	0.85	£3,903
Flat	City Infill	£103	8.18%	£6,200	0.76	£8,201
Flat	Market Town	£72	5.74%	£4,316	0.76	£5,709
Flat	Urban Regeneration	£51	4.11%	£3,061	0.76	£4,048

Table C24: 2015 - 44% to Zero carbon (Code 4 to Code 6) for privately funded dwellings.

Dwelling type	Development scenario	Additional costs per m ² (2008)	Additional costs (%)	Additional costs per dwelling	Dwelling emissions CO ₂ savings (t / yr)	Cost per tonne of CO ₂ saved / year
Detached	Small Scale	£202	32.18%	£20,642	2.69	£7,672
Detached	Market Town	£156	25.42%	£15,912	2.69	£5,914
Detached	Urban Regeneration	£159	25.91%	£16,172	2.69	£6,011
End Terrace / Semi-Detached	Small Scale	£224	37.62%	£16,988	2.15	£7,919
End Terrace / Semi-Detached	Market Town	£163	27.78%	£12,390	2.15	£5,776
End Terrace / Semi-Detached	Urban Regeneration	£165	28.30%	£12,563	2.15	£5,856
Mid-Terrace	Small Scale	£230	38.93%	£17,500	2.05	£8,555
Mid-Terrace	Market Town	£173	29.47%	£13,139	2.05	£6,423
Mid-Terrace	Urban Regeneration	£174	29.81%	£13,220	2.05	£6,463
Flat	City Infill	£157	15.63%	£9,408	1.76	£5,357
Flat	Market Town	£164	16.29%	£9,838	1.76	£5,602
Flat	Urban Regeneration	£140	14.06%	£8,397	1.76	£4,782

C1.1.2 Code compliance

The 'Cost Analysis of the Code for Sustainable Homes'²⁴ report details potential routes to Code compliance for the nominal housing types in different development scenarios.

As previously discussed in this study, the Code requires some mandatory credit levels to be achieved but then offers more flexibility for the remainder. This makes it very difficult to predict the additional costs that will be incurred for each development with any degree of certainty. However the 'broad brush' approach within the 'Cost Analysis of the Code for Sustainable Homes' report appears to be sound.

²⁴ Cost Analysis of The Code for Sustainable Homes (2008): www.communities.gov.uk/publications/planningandbuilding/codecostanalysis.



The carbon compliance mandatory element for each Code level is dealt with separately (see above). The other mandatory elements are included and shown separately within the figures. Because of its significance, the requirements with regards to water are further isolated.

The report assumes a number of 'best case', 'medium case' and 'worst case' scenarios based on two variables that are seen as potentially having the highest impact with regards to the costs of compliance. These two variables are as follows:

Ecological value of the existing site: a site of inherently low value will allow a site to achieve compliance far more easily than one with a high value; and

Flood risk: the Association of British Insurers (ABI) has published figures that confirm that the cost of mitigating developments in high flood risk areas can be significant.

For the purposes of this study only the 'best case' scenario has been considered i.e. low ecological value and low flood risk. These factors need to be further considered when the site assessments (chapter 7) are being undertaken. The aim within the Council's proposed Development Plan to only include sites of low ecological value has been noted.

It is possible to extrapolate 'baseline' figures for achieving Code compliance at each of Levels 3, 4, 5 and 6 exclusive of the Carbon Compliance requirement. For each dwelling type these figures are listed in tables C25 to C27.

Table C25: detached dwellings - baseline Code compliance costs.

Code Level	Mandatory credits 2008 (£)	Water credits 2008 (£)	Flexible credits 2008 (£)	Code compliance 2008 (£)	Cost per m ² 2008 (£)	Increase on Building Regulations (2006)
3	£490	£125	£220	£835	£8	1%
4	£490	£125	£1,110	£1,725	£17	2%
5	£490	£2,625	£1,600	£4,715	£46	6%
6	£490	£2,625	£1,950	£5,065	£50	6%

Table C26: terrace and semi-detached - baseline Code compliance costs.

Code Level	Mandatory credits 2008 (£)	Water credits 2008 (£)	Flexible credits 2008 (£)	Code compliance 2008 (£)	Cost per m ² 2008 (£)	Increase on Building Regulations (2006)
3	£490	£125	£620	£1,235	£16	2%
4	£490	£125	£1,270	£1,885	£25	3%
5	£490	£2,625	£2,060	£5,175	£68	9%
6	£490	£2,625	£3,270	£6,385	£84	11%

Table C27: flats - baseline Code compliance costs.

Code Level	Mandatory credits 2008 (£)	Water credits 2008 (£)	Flexible credits 2008 (£)	Code compliance 2008 (£)	Cost per m ² 2008 (£)	Increase on Building Regulations (2006)
3	£0	£125	£145	£270	£5	0%
4	£0	£125	£580	£705	£12	1%
5	£0	£805	£1,170	£1,975	£33	2%
6	£0	£805	£1,500	£2,305	£38	3%

Please note that for Code compliance the Cyril Sweett study did not see the need to differentiate between semi-detached or end terrace dwellings and mid-terrace dwellings.

Table C4 details the upgrade scenarios and the timeframe for these. It is important to note that for private dwellings there is no requirement for Code Compliance. The upgrade required will therefore be from 'none' to the levels specified within proposed policy PCS9.

The different potential upgrade scenarios that need to be considered are listed by dwelling type in tables C28 to C30.



Table C28: detached dwellings - potential upgrades at 2008 costing levels.

Code Level upgrade	Mandatory credits 2008 (£)	Water credits 2008 (£)	Flexible credits 2008 (£)	Code compliance 2008 (£)	Cost per m ² 2008 (£)	Increase on Building Regulations (2006)
0 to 4	£490	£125	£1,110	£1,725	£17	2%
0 to 5	£490	£2,625	£1,600	£4,715	£46	6%
0 to 6	£490	£2,625	£1,950	£5,065	£50	6%
3 to 4	£0	£0	£890	£890	£9	1%
4 to 5	£0	£2,500	£490	£2,990	£29	4%

Table C29: terrace and semi-detached - potential upgrades at 2008 costing levels.

Code Level upgrade	Mandatory credits 2008 (£)	Water credits 2008 (£)	Flexible credits 2008 (£)	Code compliance 2008 (£)	Cost per m ² 2008 (£)	Increase on Building Regulations (2006)
0 to 4	£490	£125	£1,270	£1,885	£25	3%
0 to 5	£490	£2,625	£2,060	£5,175	£68	9%
0 to 6	£490	£2,625	£3,270	£6,385	£84	11%
3 to 4	£0	£0	£650	£650	£9	1%
4 to 5	£0	£2,500	£790	£3,290	£43	6%

Table C30: flats - potential upgrades at 2008 costing levels.

Code Level upgrade	Mandatory credits 2008 (£)	Water credits 2008 (£)	Flexible credits 2008 (£)	Code compliance 2008 (£)	Cost per m ² 2008 (£)	Increase on Building Regulations (2006)
0 to 4	£0	£125	£580	£705	£12	1%
0 to 5	£0	£805	£1,170	£1,975	£33	2%
0 to 6	£0	£805	£1,500	£2,305	£38	3%
3 to 4	£0	£0	£435	£435	£7	1%
4 to 5	£0	£680	£590	£1,270	£21	2%

As is the case with carbon compliance, the Cyril Sweett report considers that there would be potential reductions in costings on the 2008 levels as the requirement to comply with the various Code levels becomes more mainstream. The potential reductions are extrapolated and summarised in Table C31.

Table C31: Anticipated reductions in Code compliance costs over time.

Year	Code 3	Code 4	Code 5	Code 6
2010	7%	3%	4%	5%
2011	14%	7%	8%	10%
2012	22%	10%	12%	15%
2013	29%	13%	16%	20%
2014	36%	16%	19%	25%
2015	43%	20%	23%	31%
2016	51%	23%	27%	36%

A caveat must be applied to table C31. The reductions proposed in carbon compliance costs over time depend on assumed volumes of development that are currently not being met.

Table C4 details the anticipated timeframe of the upgrade to comply with the proposed policy PCS9. Using this and the information in tables C25 to C30 as a basis, it is possible to confirm in each year between 2010 and 2016 the effect of PCS9 on the development costs of each of the dwelling types. The following tables (C32 to C43) confirm these values and take into account the potential reductions considered in table C31 (based on 2008 costing levels).



Table C32: 2010 - Code Level upgrade costs for privately funded dwellings.

Dwelling type & Code Level upgrade	Mandatory credits (£)	Water credits (£)	Flexible credits (£)	Code compliance (£)	Cost per m ² (£)	Increase in costs (%)
Detached: 0 to 4	£490	£121	£1,077	£1,688	£17	2%
Terrace / semi: 0 to 4	£490	£121	£1,232	£1,843	£24	3%
Flats: 0 to 4	£0	£121	£563	£684	£11	1%

Table C33: 2010 - Code Level upgrade costs for publicly funded dwellings.

Dwelling type & Code Level upgrade	Mandatory credits (£)	Water credits (£)	Flexible credits (£)	Code compliance (£)	Cost per m ² (£)	Increase in costs (%)
Detached: 3 to 4	£0	£0	£872	£872	£9	1%
Terrace / semi: 3 to 4	£0	£0	£655	£655	£9	1%
Flats: 3 to 4	£0	£0	£428	£428	£7	1%

Table C34: 2011 - Code Level upgrade costs for privately funded dwellings.

Dwelling type & Code Level upgrade	Mandatory credits (£)	Water credits (£)	Flexible credits (£)	Code compliance (£)	Cost per m ² (£)	Increase in costs (%)
Detached: 0 to 4	£490	£116	£1,032	£1,639	£16	2%
Terrace / semi: 0 to 4	£490	£116	£1,181	£1,787	£24	3%
Flats: 0 to 4	£0	£116	£539	£656	£11	1%

Table C35: 2011 - Code Level upgrade costs for publicly funded dwellings.

Dwelling type & Code Level upgrade	Mandatory credits (£)	Water credits (£)	Flexible credits (£)	Code compliance (£)	Cost per m ² (£)	Increase in costs (%)
Detached: 3 to 4	£0	£0	£843	£843	£8	1%
Terrace / semi: 3 to 4	£0	£0	£648	£648	£9	1%
Flats: 3 to 4	£0	£0	£415	£415	£7	1%

Table C36: 2012 - Code Level upgrade costs for privately funded dwellings.

Dwelling type & Code Level upgrade	Mandatory credits (£)	Water credits (£)	Flexible credits (£)	Code compliance (£)	Cost per m ² (£)	Increase in costs (%)
Detached: 0 to 5	£490	£2,310	£1,408	£4,208	£41	5%
Terrace / semi: 0 to 5	£490	£2,310	£1,813	£4,613	£61	8%
Flats: 0 to 5	£0	£708	£1,030	£1,738	£29	2%

Table C37: 2012 - Code Level upgrade costs for publicly funded dwellings.

Dwelling type & Code Level upgrade	Mandatory credits (£)	Water credits (£)	Flexible credits (£)	Code compliance (£)	Cost per m ² (£)	Increase in costs (%)
Detached: 3 to 5	£0	£2,198	£409	£2,607	£26	4%
Terrace / semi: 3 to 5	£0	£2,198	£670	£2,867	£38	5%
Flats: 3 to 5	£0	£596	£508	£1,104	£18	1%

Table C38: 2013 - Code Level upgrade costs for privately funded dwellings.

Dwelling type & Code Level upgrade	Mandatory credits (£)	Water credits (£)	Flexible credits (£)	Code compliance (£)	Cost per m ² (£)	Increase in costs (%)
Detached: 0 to 5	£490	£2,205	£1,344	£4,039	£40	5%
Terrace / semi: 0 to 5	£490	£2,205	£1,730	£4,425	£58	8%
Flats: 0 to 5	£0	£676	£983	£1,659	£28	2%



Table C39: 2013 - Code Level upgrade costs for publicly funded dwellings.

Dwelling type & Code Level upgrade	Mandatory credits (£)	Water credits (£)	Flexible credits (£)	Code compliance (£)	Cost per m ² (£)	Increase in costs (%)
Detached: 3 to 5	£0	£2,096	£378	£2,475	£24	4%
Terrace / semi: 3 to 5	£0	£2,096	£626	£2,722	£36	5%
Flats: 3 to 5	£0	£567	£478	£1,046	£17	1%

Table C40: 2014 - Code Level upgrade costs for privately funded dwellings.

Dwelling type & Code Level upgrade	Mandatory credits (£)	Water credits (£)	Flexible credits (£)	Code compliance (£)	Cost per m ² (£)	Increase in costs (%)
Detached: 0 to 5	£490	£2,126	£1,296	£3,912	£38	5%
Terrace / semi: 0 to 5	£490	£2,126	£1,669	£4,285	£56	8%
Flats: 0 to 5	£0	£652	£948	£1,600	£27	2%

Table C41: 2014 - Code Level upgrade costs for publicly funded dwellings.

Dwelling type & Code Level upgrade	Mandatory credits (£)	Water credits (£)	Flexible credits (£)	Code compliance (£)	Cost per m ² (£)	Increase in costs (%)
Detached: 4 to 5	£0	£2,021	£364	£2,385	£23	4%
Terrace / semi: 4 to 5	£0	£2,021	£602	£2,623	£35	4%
Flats: 4 to 5	£0	£547	£461	£1,008	£17	1%

Table C42: 2015 - Code Level upgrade costs for privately funded dwellings.

Dwelling type & Code Level upgrade	Mandatory credits (£)	Water credits (£)	Flexible credits (£)	Code compliance (£)	Cost per m ² (£)	Increase in costs (%)
Detached: 0 to 6	£490	£1,811	£1,346	£3,647	£36	5%
Terrace / semi: 0 to 6	£490	£1,811	£2,256	£4,558	£60	8%
Flats: 0 to 6	£0	£555	£1,035	£1,590	£27	2%

Table C43: 2016 - Code Level upgrade costs for privately funded dwellings.

Dwelling type & Code Level upgrade	Mandatory credits (£)	Water credits (£)	Flexible credits (£)	Code compliance (£)	Cost per m ² (£)	Increase in costs (%)
Detached: 0 to 6	£490	£1,680	£1,248	£3,418	£34	4%
Terrace / semi: 0 to 6	£490	£1,680	£2,093	£4,263	£56	8%
Flats: 0 to 6	£0	£515	£960	£1,475	£25	2%

C1.1.3 Carbon and Code compliance

Having calculated the effect of both the carbon and the Code compliance for the notional dwelling types in the different development scenarios, the two datasets can be combined to give an overall figure of the potential additional cost requirements in relation to the introduction of policy PCS9 (tables C44 to C57). This dataset begins at 2010, when the Council's policy is proposed to come into effect, to 2016 when the carbon compliance figures will be at the same level as national standards.

It should be noted that these figures assume:

- 'Zero carbon' compliance will be from 'on-site' or 'private wire' renewables;
- Wind has not been considered as an option;
- UK development rates will proceed in accordance with the proposed increases and will reach 240,000 new homes per annum by 2016;
- Sites are of low ecological value; and
- Sites are in an area of low flood risk i.e. there is no financial requirement to mitigate flood risk.

It should further be noted that beyond 2016 there will continue to be a discrepancy for private dwellings attaining Code levels. This is because national policy does not seek full Code compliance, only carbon compliance. In comparison, Portsmouth City Council would require full Code compliance, including carbon compliance.



Table C44: 2010 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£6,788	£1,688	£8,476	11%
Detached	Market Town	£5,773	£1,688	£7,461	9%
Detached	Urban Regeneration	£2,606	£1,688	£4,294	5%
End Terrace / Semi-Detached	Small Scale	£1,905	£1,843	£3,748	7%
End Terrace / Semi-Detached	Market Town	£3,320	£1,843	£5,163	9%
End Terrace / Semi-Detached	Urban Regeneration	£1,853	£1,843	£3,696	7%
Mid-Terrace	Small Scale	£1,180	£1,843	£3,024	5%
Mid-Terrace	Market Town	£2,420	£1,843	£4,263	8%
Mid-Terrace	Urban Regeneration	£1,528	£1,843	£3,371	6%
Flat	City Infill	£2,359	£684	£3,043	4%
Flat	Market Town	£2,359	£684	£3,043	4%
Flat	Urban Regeneration	£2,095	£684	£2,779	3%

Table C45: 2010 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£6,788	£872	£7,660	10%
Detached	Market Town	£5,773	£872	£6,646	8%
Detached	Urban Regeneration	£2,606	£872	£3,478	4%
End Terrace / Semi-Detached	Small Scale	£1,905	£655	£2,560	5%
End Terrace / Semi-Detached	Market Town	£3,320	£655	£3,976	7%
End Terrace / Semi-Detached	Urban Regeneration	£1,853	£655	£2,508	4%
Mid-Terrace	Small Scale	£1,180	£655	£1,836	3%
Mid-Terrace	Market Town	£2,420	£655	£3,075	5%

Mid-Terrace	Urban Regeneration	£1,528	£655	£2,183	4%
Flat	City Infill	£2,359	£428	£2,787	3%
Flat	Market Town	£2,359	£428	£2,787	3%
Flat	Urban Regeneration	£2,095	£428	£2,523	3%

Table C46: 2011 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£6,718	£1,639	£8,357	10%
Detached	Market Town	£5,714	£1,639	£7,352	9%
Detached	Urban Regeneration	£2,580	£1,639	£4,218	5%
End Terrace / Semi-Detached	Small Scale	£1,885	£1,787	£3,673	6%
End Terrace / Semi-Detached	Market Town	£3,286	£1,787	£5,073	9%
End Terrace / Semi-Detached	Urban Regeneration	£1,834	£1,787	£3,621	6%
Mid-Terrace	Small Scale	£1,168	£1,787	£2,956	5%
Mid-Terrace	Market Town	£2,395	£1,787	£4,183	7%
Mid-Terrace	Urban Regeneration	£1,512	£1,787	£3,299	6%
Flat	City Infill	£2,335	£656	£2,990	4%
Flat	Market Town	£2,335	£656	£2,990	4%
Flat	Urban Regeneration	£2,074	£656	£2,729	3%

Table C47: 2011 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£6,718	£843	£7,561	9%
Detached	Market Town	£5,714	£843	£6,557	8%
Detached	Urban Regeneration	£2,580	£843	£3,423	4%



End Terrace / Semi-Detached	Small Scale	£1,885	£648	£2,533	4%
End Terrace / Semi-Detached	Market Town	£3,286	£648	£3,934	7%
End Terrace / Semi-Detached	Urban Regeneration	£1,834	£648	£2,482	4%
Mid-Terrace	Small Scale	£1,168	£648	£1,816	3%
Mid-Terrace	Market Town	£2,395	£648	£3,043	5%
Mid-Terrace	Urban Regeneration	£1,512	£648	£2,160	4%
Flat	City Infill	£2,335	£415	£2,749	3%
Flat	Market Town	£2,335	£415	£2,749	3%
Flat	Urban Regeneration	£2,074	£415	£2,488	3%

Table C48: 2012 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£17,081	£4,208	£21,289	27%
Detached	Market Town	£12,213	£4,208	£16,421	20%
Detached	Urban Regeneration	£7,997	£4,208	£12,205	15%
End Terrace / Semi-Detached	Small Scale	£8,641	£4,613	£13,254	23%
End Terrace / Semi-Detached	Market Town	£7,981	£4,613	£12,594	22%
End Terrace / Semi-Detached	Urban Regeneration	£5,740	£4,613	£10,352	18%
Mid-Terrace	Small Scale	£7,377	£4,613	£11,990	21%
Mid-Terrace	Market Town	£6,483	£4,613	£11,095	20%
Mid-Terrace	Urban Regeneration	£4,910	£4,613	£9,523	17%
Flat	City Infill	£8,720	£1,738	£10,458	13%
Flat	Market Town	£6,774	£1,738	£8,512	11%
Flat	Urban Regeneration	£5,218	£1,738	£6,956	9%

Table C49: 2012 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,433	£2,607	£13,040	16%
Detached	Market Town	£6,558	£2,607	£9,165	11%
Detached	Urban Regeneration	£5,444	£2,607	£8,051	10%
End Terrace / Semi-Detached	Small Scale	£6,776	£2,867	£9,643	17%
End Terrace / Semi-Detached	Market Town	£4,729	£2,867	£7,596	13%
End Terrace / Semi-Detached	Urban Regeneration	£3,925	£2,867	£6,792	12%
Mid-Terrace	Small Scale	£6,221	£2,867	£9,089	16%
Mid-Terrace	Market Town	£4,112	£2,867	£6,980	12%
Mid-Terrace	Urban Regeneration	£3,414	£2,867	£6,281	11%
Flat	City Infill	£6,410	£1,104	£7,513	9%
Flat	Market Town	£4,463	£1,104	£5,567	7%
Flat	Urban Regeneration	£3,166	£1,104	£4,269	5%

Table C50: 2013 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,318	£4,039	£14,357	18%
Detached	Market Town	£6,486	£4,039	£10,525	13%
Detached	Urban Regeneration	£5,384	£4,039	£9,423	12%
End Terrace / Semi-Detached	Small Scale	£6,701	£4,425	£11,127	20%
End Terrace / Semi-Detached	Market Town	£4,677	£4,425	£9,102	16%
End Terrace / Semi-Detached	Urban Regeneration	£3,882	£4,425	£8,307	15%
Mid-Terrace	Small Scale	£6,153	£4,425	£10,579	19%
Mid-Terrace	Market Town	£4,067	£4,425	£8,492	15%



Mid-Terrace	Urban Regeneration	£3,376	£4,425	£7,802	14%
Flat	City Infill	£6,340	£1,659	£7,999	10%
Flat	Market Town	£4,414	£1,659	£6,073	8%
Flat	Urban Regeneration	£3,131	£1,659	£4,790	6%

Table C51: 2013 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,318	£2,475	£12,793	16%
Detached	Market Town	£6,486	£2,475	£8,960	11%
Detached	Urban Regeneration	£5,384	£2,475	£7,859	10%
End Terrace / Semi-Detached	Small Scale	£6,701	£2,722	£9,423	17%
End Terrace / Semi-Detached	Market Town	£4,677	£2,722	£7,398	13%
End Terrace / Semi-Detached	Urban Regeneration	£3,882	£2,722	£6,603	12%
Mid-Terrace	Small Scale	£6,153	£2,722	£8,875	16%
Mid-Terrace	Market Town	£4,067	£2,722	£6,789	12%
Mid-Terrace	Urban Regeneration	£3,376	£2,722	£6,098	11%
Flat	City Infill	£6,340	£1,046	£7,385	9%
Flat	Market Town	£4,414	£1,046	£5,460	7%
Flat	Urban Regeneration	£3,131	£1,046	£4,176	5%

Table C52: 2014 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,089	£3,912	£14,002	17%
Detached	Market Town	£6,340	£3,912	£10,252	13%
Detached	Urban Regeneration	£5,263	£3,912	£9,176	11%

End Terrace / Semi-Detached	Small Scale	£6,553	£4,285	£10,838	19%
End Terrace / Semi-Detached	Market Town	£4,572	£4,285	£8,857	16%
End Terrace / Semi-Detached	Urban Regeneration	£3,795	£4,285	£8,079	14%
Mid-Terrace	Small Scale	£6,017	£4,285	£10,302	18%
Mid-Terrace	Market Town	£3,976	£4,285	£8,261	15%
Mid-Terrace	Urban Regeneration	£3,301	£4,285	£7,586	13%
Flat	City Infill	£6,200	£1,600	£7,800	10%
Flat	Market Town	£4,316	£1,600	£5,916	7%
Flat	Urban Regeneration	£3,061	£1,600	£4,660	6%

Table C53: 2014 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,089	£2,385	£12,474	16%
Detached	Market Town	£6,340	£2,385	£8,725	11%
Detached	Urban Regeneration	£5,263	£2,385	£7,648	10%
End Terrace / Semi-Detached	Small Scale	£6,553	£2,623	£9,176	16%
End Terrace / Semi-Detached	Market Town	£4,572	£2,623	£7,195	13%
End Terrace / Semi-Detached	Urban Regeneration	£3,795	£2,623	£6,418	11%
Mid-Terrace	Small Scale	£6,017	£2,623	£8,640	15%
Mid-Terrace	Market Town	£3,976	£2,623	£6,599	12%
Mid-Terrace	Urban Regeneration	£3,301	£2,623	£5,924	10%
Flat	City Infill	£6,200	£1,008	£7,207	9%
Flat	Market Town	£4,316	£1,008	£5,324	7%
Flat	Urban Regeneration	£3,061	£1,008	£4,068	5%



Table C54: 2015 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£20,642	£3,647	£24,288	30%
Detached	Market Town	£15,912	£3,647	£19,558	24%
Detached	Urban Regeneration	£16,172	£3,647	£19,819	25%
End Terrace / Semi-Detached	Small Scale	£16,988	£4,558	£21,545	38%
End Terrace / Semi-Detached	Market Town	£12,390	£4,558	£16,948	30%
End Terrace / Semi-Detached	Urban Regeneration	£12,563	£4,558	£17,121	30%
Mid-Terrace	Small Scale	£17,500	£4,558	£22,057	39%
Mid-Terrace	Market Town	£13,139	£4,558	£17,696	31%
Mid-Terrace	Urban Regeneration	£13,220	£4,558	£17,778	31%
Flat	City Infill	£9,408	£1,590	£10,998	14%
Flat	Market Town	£9,838	£1,590	£11,428	14%
Flat	Urban Regeneration	£8,397	£1,590	£9,988	12%

Table C55: 2015 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale				
Detached	Market Town				
Detached	Urban Regeneration				
End Terrace / Semi-Detached	Small Scale				
End Terrace / Semi-Detached	Market Town				
End Terrace / Semi-Detached	Urban Regeneration				
Mid-Terrace	Small Scale				
Mid-Terrace	Market Town				

Mid-Terrace	Urban Regeneration				
Flat	City Infill				
Flat	Market Town				
Flat	Urban Regeneration				

Table C56: 2016 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£3,418	£3,418	4%
Detached	Market Town	£0	£3,418	£3,418	4%
Detached	Urban Regeneration	£0	£3,418	£3,418	4%
End Terrace / Semi-Detached	Small Scale	£0	£4,263	£4,263	8%
End Terrace / Semi-Detached	Market Town	£0	£4,263	£4,263	8%
End Terrace / Semi-Detached	Urban Regeneration	£0	£4,263	£4,263	8%
Mid-Terrace	Small Scale	£0	£4,263	£4,263	8%
Mid-Terrace	Market Town	£0	£4,263	£4,263	8%
Mid-Terrace	Urban Regeneration	£0	£4,263	£4,263	8%
Flat	City Infill	£0	£1,475	£1,475	2%
Flat	Market Town	£0	£1,475	£1,475	2%
Flat	Urban Regeneration	£0	£1,475	£1,475	2%

Table C57: 2016 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£0	£0	0%
Detached	Market Town	£0	£0	£0	0%
Detached	Urban Regeneration	£0	£0	£0	0%



End Terrace / Semi-Detached	Small Scale	£0	£0	£0	0%
End Terrace / Semi-Detached	Market Town	£0	£0	£0	0%
End Terrace / Semi-Detached	Urban Regeneration	£0	£0	£0	0%
Mid-Terrace	Small Scale	£0	£0	£0	0%
Mid-Terrace	Market Town	£0	£0	£0	0%
Mid-Terrace	Urban Regeneration	£0	£0	£0	0%
Flat	City Infill	£0	£0	£0	0%
Flat	Market Town	£0	£0	£0	0%
Flat	Urban Regeneration	£0	£0	£0	0%

Please note that all costings information within tables C44 to C57 is based on the following assumptions:

'Zero carbon' compliance will be from 'on-site' or 'private wire' renewables;

Wind has not been considered as an option;

UK development rates will proceed in accordance with the proposed increases and will reach 240,000 new homes per annum by 2016;

Sites are of low ecological value; and

Sites are in an area of low flood risk, i.e. there is no financial requirement to mitigate flood risk.

These results have been summarised in tables C58 and C59. C58 refers to the increased cost of dwellings that are privately funded, while C59 refers to the increased cost of dwellings that are publicly funded.

Table C58: Additional development costs summary of privately funded dwellings.

Dwelling type	Development scenario	2010	2011	2012	2013	2014	2015	2016
Detached	Small Scale	£8,476	£8,357	£21,289	£14,357	£14,002	£24,288	£3,418
Detached	Market Town	£7,461	£7,352	£16,421	£10,525	£10,252	£19,558	£3,418
Detached	Urban Regeneration	£4,294	£4,218	£12,205	£9,423	£9,176	£19,819	£3,418
End Terrace / Semi-Detached	Small Scale	£3,748	£3,673	£13,254	£11,127	£10,838	£21,545	£4,263
End Terrace / Semi-Detached	Market Town	£5,163	£5,073	£12,594	£9,102	£8,857	£16,948	£4,263
End Terrace / Semi-Detached	Urban Regeneration	£3,696	£3,621	£10,352	£8,307	£8,079	£17,121	£4,263

Mid-Terrace	Small Scale	£3,024	£2,956	£11,990	£10,579	£10,302	£22,057	£4,263
Mid-Terrace	Market Town	£4,263	£4,183	£11,095	£8,492	£8,261	£17,696	£4,263
Mid-Terrace	Urban Regeneration	£3,371	£3,299	£9,523	£7,802	£7,586	£17,778	£4,263
Flat	City Infill	£3,043	£2,990	£10,458	£7,999	£7,800	£10,998	£1,475
Flat	Market Town	£3,043	£2,990	£8,512	£6,073	£5,916	£11,428	£1,475
Flat	Urban Regeneration	£2,779	£2,729	£6,956	£4,790	£4,660	£9,988	£1,475
	Average	£4,363	£4,287	£12,054	£9,048	£8,811	£17,435	£3,355

Table C59: Additional development costs summary of publicly funded dwellings.

Dwelling type	Development scenario	2010	2011	2012	2013	2014	2015	2016
Detached	Small Scale	£7,660	£7,561	£13,040	£12,793	£12,474	£0	£0
Detached	Market Town	£6,646	£6,557	£9,165	£8,960	£8,725	£0	£0
Detached	Urban Regeneration	£3,478	£3,423	£8,051	£7,859	£7,648	£0	£0
End Terrace / Semi-Detached	Small Scale	£2,560	£2,533	£9,643	£9,423	£9,176	£0	£0
End Terrace / Semi-Detached	Market Town	£3,976	£3,934	£7,596	£7,398	£7,195	£0	£0
End Terrace / Semi-Detached	Urban Regeneration	£2,508	£2,482	£6,792	£6,603	£6,418	£0	£0
Mid-Terrace	Small Scale	£1,836	£1,816	£9,089	£8,875	£8,640	£0	£0
Mid-Terrace	Market Town	£3,075	£3,043	£6,980	£6,789	£6,599	£0	£0
Mid-Terrace	Urban Regeneration	£2,183	£2,160	£6,281	£6,098	£5,924	£0	£0
Flat	City Infill	£2,787	£2,749	£7,513	£7,385	£7,207	£0	£0
Flat	Market Town	£2,787	£2,749	£5,567	£5,460	£5,324	£0	£0
Flat	Urban Regeneration	£2,523	£2,488	£4,269	£4,176	£4,068	£0	£0
	Average	£3,502	£3,458	£7,832	£7,652	£7,450	£0	£0



C1.1.4 Summary - predicted cost impact with forecasted growth

As mentioned above, the Council's draft Core Strategy makes provision for 14,700 new homes. While the Secretary of State removed the five year phasing of housing delivery in Portsmouth, Impetus and Greenlight Construction consider the new average housing development figure of 735 too arbitrary a figure to base this report's costing analysis on. Therefore, we have based our analysis on the projected housing development figures within the SHLAA analysis.

PCS9 will continue to require that developers meet Code compliance requirements beyond 2016. This is in advance of the current intentions for national policy beyond 2016 and therefore costs after 2016 have not been analysed.

As can be seen in tables C58 and C59 above, the average cost to developers of both private and publicly funded developments increases and decreases as development moves towards zero carbon.

Privately funded developments see two large increases with the shift to Code Level 5 and Code Level 6. This is due to the large increase in carbon reduction from Code Levels 4 to 5 (a further 127% reduction in regulated emissions) and Code Levels 5 to 6 (the elimination of the remaining residual emissions).

Publicly funded developments see a relatively large increase in costs with the shift to Code Level 5 in 2012, although developers then follow the Homes and Communities Agency's (HCA) mandatory timetable from 2015. This means that in 2015 and 2016, policy PCS9 would not increase the financial burden on developers since the standards would be mandatory for publicly developments.

Taking into account the average cost of construction (as per the Q4 2007 pricing levels, averaged across the four dwelling types), this results in the following percentage cost increase for developers:

Privately funded developments:

- 2010 – 6.37%
- 2011 – 6.26%
- 2012 – 17.60%
- 2013 – 13.21%
- 2014 – 12.87%
- 2015 – 25.45%
- 2016 – 4.89%

Publicly funded developments:

- 2010 – 5.11%

2011 – 5.05%
2012 – 11.43%
2013 – 11.17%
2014 – 10.87%
2015 – 0%
2016 – 0%

It is important to recognise that the additional cost to publicly funded development is less than privately funded development. This is due to Policy PCS9 matching national policy requirements for publicly funded development. On average, the additional cost to privately funded development is 12.3% between 2010 and 2016. The average additional cost to publicly funded development over the same period is 6.2%.

Impetus and Greenlight Construction have concerns that the additional costs to developers, particularly those increases above 10%, could be considered an undue financial burden²⁵ on developers. This is especially true for major developments (classified as 10 or more dwellings), which will have additional financial burden placed on them by the policy's renewable energy requirement.

The issue of undue financial burden in relation to the Code for Sustainable Homes has been explored further in section 6.0 of this report.

²⁵ Please note that there is currently no recognised definition of undue burden in national policy or guidance. Anecdotal evidence suggests that an increase in costs of over 10% is undue. PPS 22 simply requires that policies “”. The issue of cost is currently being looked at as part of the consultation on the definition of zero carbon, however this will only relate to the Code for Sustainable Homes, and not developments incorporating BREEAM standards and/or renewable energy requirements. The government is looking at setting a figure of £ per tonne of carbon within the Code as part of ‘allowable solutions’.



APPENDIX D - RENEWABLE ENERGY AND LOW CARBON TECHNOLOGY SCENARIOS

In response to national, regional and sub-regional drivers, and local support, Portsmouth City Council has added a renewable energy requirement (a 'Merton-Rule' policy) within POLICY PCS9: SUSTAINABLE DEVELOPMENT:

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'Major development' is defined as 10 or more dwellings and 1000m² or more of non-residential floorspace.

This section of the report analyses the scale and costs of meeting this target.

Unfortunately, there are no costing studies that review the additional cost of 'Merton Rule' policies. The London Borough of Merton, which originally introduced this type of policy, simply based its original 10% renewables target on an estimated average 3% increase in capital costs.

Since there is no specific data available on cost implications for this type of policy, we have developed a series of renewable energy and low carbon technology scenarios.

Please note that non-domestic developments have not been assessed due to the variability of energy consumption in speculative developments and of data in relation to non-domestic renewable energy and low carbon technologies. This type of data is also not readily available.

The baseline energy and emissions data, and construction costs (Q4 2007 pricing levels) used within this analysis are based on the information contained within the 'Cost Analysis of The Code for Sustainable Homes' (2008) publication. Data on renewable energy and low carbon technologies, including energy generation and carbon saving capabilities and costs, was obtained from the Energy Saving Trust, National House-Building Council (NHBC) and the Communities and Local Government (CLG) department.

D1.1 Baseline data

Each major development (over 10 dwellings) will be required to meet the following sustainability standards (table D1), which will in turn effect the carbon emissions to be reduced.

Table D1: Current PCS9 requirements in terms of meeting Levels of the Code for Sustainable Homes.

Year	All development
2008	
2009	
2010	Level 4
2011	
2012	Level 5
2013	
2014	
2015	Level 6
2016	

Below we have provided data on the typical carbon emissions of new build dwellings built to 2006 Building Regulation standards (table D2) and to different levels of the Code for Sustainable Homes (tables D3 to D6). Since no data exists on the energy consumption of homes built to the different levels of the Code for Sustainable Homes, the information provided below relates to expected carbon dioxide emissions.

Table D2: Four house types, built to Building Regulations (2006) Part L1 standards. Source: 'Cost Analysis of the Code for Sustainable Homes'.

Building type	Detached dwellings	End Terrace / Semi-detached	Mid-Terrace	Flat
Internal floor area (m ²)	102	76	76	60
Average construction cost (£ per m ²)	£786	£745	£745	£1,342
Average construction cost (£)	£80,172	£56,620	£56,620	£80,520
Regulated CO ₂ emissions (t per year)	2.34	1.7	1.51	1.35
Unregulated CO ₂ emissions (t per year)	1.38	1.2	1.2	1
Overall carbon emissions (regulated and unregulated) (t per year)	3.72	2.9	2.71	2.35



Table D3: Four house types, built to Code for Sustainable Homes Level 4 standards. Source: 'Cost Analysis of the Code for Sustainable Homes'.

Emissions	Detached dwellings	End Terrace /Semi-Detached	Mid-Terrace	Flat
Regulated CO ₂ emissions (t per year)	1.755	1.275	1.1325	1.0125
Unregulated CO ₂ emissions (t per year)	1.38	1.2	1.2	1
Overall carbon emissions (regulated and unregulated) (t per year)	3.135	2.475	2.3325	2.0125

Table D4: Four house types, built to Code for Sustainable Homes Level 5 standards. Source: 'Cost Analysis of the Code for Sustainable Homes'.

Emissions	Detached dwellings	End Terrace /Semi-Detached	Mid-Terrace	Flat
Regulated CO ₂ emissions (t per year)	0	0	0	0
Unregulated CO ₂ emissions (t per year)	1.38	1.2	1.2	1
Overall carbon emissions (regulated and unregulated) (t per year)	1.38	1.2	1.2	1

Table D5: Four house types, built to Code for Sustainable Homes Level 6 standards. Source: 'Cost Analysis of the Code for Sustainable Homes'.

Emissions	Detached dwellings	End Terrace /Semi-Detached	Mid-Terrace	Flat
Regulated CO ₂ emissions (t per year)	0	0	0	0
Unregulated CO ₂ emissions (t per year)	0	0	0	0
Overall carbon emissions (regulated and unregulated) (t per year)	0	0	0	0

Table D6 provides an analysis of the typical CO₂ emissions reductions that different renewable energy and low carbon technologies will make, both in terms of the kg/CO₂ reduction per year and the average cost of each technology.

Table D6: review of the renewable energy and low carbon technologies. Source: Energy Saving Trust, NHBC and CLG.

Renewable energy and low carbon technology	CO₂ savings (t/CO₂/yr)	Average cost (£)	Assumptions
PV	0.68	4,500	Size: 2.5kWp.
Solar thermal	0.23	850	Size: 4m ² . Natural gas is the fuel being replaced.
Ground Source Heat Pump (GSHP)	0.23	1,775	Savings data is from a semi-detached property. Assumes 100% of space heating only.
Air Source Heat Pump (ASHP)	0.58	2,000	Savings data is from a semi-detached property. Assumes 100% of space heating only.
Biomass boiler	1.3	10,000	Size: 15kW. Assumes 100% of space and hot water heating.



This data is used in a range of different scenarios in the section below. Each scenario includes an estimate of the typical cost to developers of installing the technologies in each scenario.

Tables D7 to D9 show the development scenarios that will be analysed.

Table D7: Development scenario 1 – 10 dwellings.

Dwelling type	Number
Detached	4
End terrace/semi detached	2
Mid terrace	4
Flat	0
Total	10

Table D8: Development scenario 2 – 20 dwellings.

Dwelling type	Number
Detached	5
End terrace/semi detached	0
Mid terrace	0
Flat	15
Total	20

Table D9: Development scenario 3 – 50 dwellings.

Dwelling type	Number
Detached	5
End terrace/semi detached	20
Mid terrace	0
Flat	25
Total	50

Table D10 highlights the average cost of construction and residual carbon emissions until 2016. Developments built in 2010 and 2011, and those built between 2012 and 2014, share the same carbon reduction target due to the implementation of the Code for Sustainable Homes in policy PCS9. In 2015 and 2016, and beyond 2016, homes will be zero carbon and will have no residual emissions to offset through a renewable energy policy.

Table D10: scenarios 1, 2 and 3 average construction costs and residual carbon dioxide emissions.

Dwelling type	Number of units	Average construction cost per unit/scenario	Remaining CO ₂ emissions (regulated and unregulated) (t per year)						
			2010	2011	2012	2013	2014	2015	2016
Scenario 1									
Detached	4	£80,172	10.76	10.76	5.52	5.52	5.52	0	0
End terrace/semi detached	2	£56,620	4.30	4.30	2.4	2.4	2.4	0	0
Mid terrace	4	£56,620	8.18	8.18	4.8	4.8	4.8	0	0
Flat	~	~	~	~	~	~	~	~	~
Scenario 1 total	10	£660,408	23.24	23.24	12.72	12.72	12.72	0	0
Scenario 2									
Detached	5	£400,860	13.45	13.452	6.9	6.9	6.9	0	0
End terrace/semi detached	~	~	~	~	~	~	~	~	~
Mid terrace	~	~	~	~	~	~	~	~	~
Flat	15	£1,207,800	26.34	26.34	15	15	15	0	0
Scenario 2 total	15	£1,608,660	39.79	39.79	21.9	21.9	21.9	0	0
Scenario 3									
Detached	5	£400,860	13.45	13.45	6.9	6.9	6.9	0	0
End terrace/semi detached	20	£1,132,400	43.04	43.04	24	24	24	0	0
Mid terrace	~	~	~	~	~	~	~	~	~
Flat	25	£2,013,000	43.9	43.9	25	25	25	0	0
Scenario 3 total	50	£3,546,260	100.39	100.39	55.9	55.9	55.9	0	0

D1.2 Development scenario 1

Table D11 highlights the residual emissions that must be offset as per the Council's renewable energy requirement. The development's total residual emissions drop from 5.81 tonnes of CO₂ per year in 2010 and 2011, to 3.18 tonnes of CO₂ per year between 2012 and 2014, to zero in 2015 and 2016 due to Code Level 6 being met.



Table D11: Scenario 1 carbon dioxide emissions reductions required by renewable energy and low carbon technologies.

Remaining CO₂ emissions (regulated and unregulated) (t per year)						
2010	2011	2012	2013	2014	2015	2016
5.81	5.81	3.18	3.18	3.18	0	0

2010 - 2011

Tables D12 to D14 highlight the renewable energy and low carbon technology options (A, B and C) for offsetting 5.81 tonnes of CO₂ per year in development scenario 1 over the period 2010 to 2011.

Table D12: Scenario 1 – 2010 - 2011: Renewable energy and low carbon technologies option A.

Renewable energy and low carbon technology	Installed on number of units	CO₂ savings (t/CO₂/yr)	Average cost (£)	Total CO₂ savings (t/CO₂/yr)	Total cost (£)	Percentage cost increase (%)
Solar thermal	10	0.23	850	5.9	24,475	3.7
Ground Source Heat Pump	9	0.23	1,775			

Table D13: Scenario 1 – 2010 - 2011: Renewable energy and low carbon technologies option B.

Renewable energy and low carbon technology	Installed on number of units	CO₂ savings (t/CO₂/yr)	Average cost (£)	Total CO₂ savings (t/CO₂/yr)	Total cost (£)	Percentage cost increase (%)
PV	8	0.68	4,500	5.84	37,775	5.71
Ground Source Heat Pump	1	0.23	1,775			

Table D14: Scenario 1 – 2010 - 2011: Renewable energy and low carbon technologies option C.

Renewable energy and low carbon technology	Installed on number of units	CO₂ savings (t/CO₂/yr)	Average cost (£)	Total CO₂ savings (t/CO₂/yr)	Total cost (£)	Percentage cost increase (%)
PV	1	0.68	4,500	5.88	44,500	6.7
Biomass boiler	4	1.3	10,000			

2012 - 2014

Tables D15 to D17 highlight the renewable energy and low carbon technology options (A, B and C) for offsetting 3.18 tonnes of CO₂ per year in development scenario 1 between 2012 to 2014.

Table D15: Scenario 1 – 2012 - 2014: Renewable energy and low carbon technologies option A.

Renewable energy and low carbon technology	Installed on number of units	CO ₂ savings (t/CO ₂ /yr)	Average cost (£)	Total CO ₂ savings (t/CO ₂ /yr)	Total cost (£)	Percentage cost increase (%)
Solar thermal	10	0.23	850	3.46	12,500	1.89
Air Source Heat Pump	2	0.58	2,000			

Table D16: Scenario 1 – 2012 - 2014: Renewable energy and low carbon technologies option B.

Renewable energy and low carbon technology	Installed on number of units	CO ₂ savings (t/CO ₂ /yr)	Average cost (£)	Total CO ₂ savings (t/CO ₂ /yr)	Total cost (£)	Percentage cost increase (%)
PV	5	0.68	4,500	3.4	22,500	3.4

Table D17: Scenario 1 – 2012 - 2014: Renewable energy and low carbon technologies option C.

Renewable energy and low carbon technology	Installed on number of units	CO ₂ savings (t/CO ₂ /yr)	Average cost (£)	Total CO ₂ savings (t/CO ₂ /yr)	Total cost (£)	Percentage cost increase (%)
Biomass boiler	3	1.3	10,000	3.9	30,000	4.54

2015-2016

There are no residual emissions to be offset from dwellings built to Code for Sustainable Homes Level 6.

D1.3 Development scenario 2

Table D18 highlights the residual emissions that must be offset as per the Council's renewable energy requirement. The development's total residual emissions drop from 9.94 tonnes of CO₂ per year in 2010 and 2011, to 5.47 tonnes of CO₂ per year between 2012 and 2014, to zero in 2015 and 2016 due to Code Level 6 being met.



Table D18: scenario 1 carbon dioxide emissions reductions required by renewable energy and low carbon technologies.

Remaining CO₂ emissions (regulated and unregulated) (t per year)						
2010	2011	2012	2013	2014	2015	2016
9.94	9.94	5.47	5.47	5.47	0	0

2010 - 2011

Tables D19 to D21 highlight the renewable energy and low carbon technology options (A, B and C) for offsetting 9.94 tonnes of CO₂ per year in development scenario 2 over the period 2010 to 2011.

Table D19: Scenario 2 – 2010 - 2011: Renewable energy and low carbon technologies option A.

Renewable energy and low carbon technology	Installed on number of units	CO₂ savings (t/CO₂/yr)	Average cost (£)	Total CO₂ savings (t/CO₂/yr)	Total cost (£)	Percentage cost increase (%)
Solar thermal	20	0.23	850	10.2	41,850	2.60
Ground Source Heat Pump	14	0.23	1,775			

Table D20: Scenario 2 – 2010 - 2011: Renewable energy and low carbon technologies option B.

Renewable energy and low carbon technology	Installed on number of units	CO₂ savings (t/CO₂/yr)	Average cost (£)	Total CO₂ savings (t/CO₂/yr)	Total cost (£)	Percentage cost increase (%)
PV	15	0.68	4,500	10.2	67,500	4.19

Table D21: Scenario 2 – 2010 - 2011: Renewable energy and low carbon technologies option C.

Renewable energy and low carbon technology	Installed on number of units	CO₂ savings (t/CO₂/yr)	Average cost (£)	Total CO₂ savings (t/CO₂/yr)	Total cost (£)	Percentage cost increase (%)
Solar thermal	4	0.23	850	10.02	73,400	4.56
Biomass boiler	7	1.3	10,000			

2012 - 2014

Tables D22 to D24 highlight the renewable energy and low carbon technology options (A, B and C) for offsetting 5.47 tonnes of CO₂ per year in development scenario 2 over the period 2010 to 2011.

Table D22: Scenario 2 – 2012 - 2014: Renewable energy and low carbon technologies option A.

Renewable energy and low carbon technology	Installed on number of units	CO ₂ savings (t/CO ₂ /yr)	Average cost (£)	Total CO ₂ savings (t/CO ₂ /yr)	Total cost (£)	Percentage cost increase (%)
Solar thermal	10	0.23	850	5.5	22,700	1.41
Ground Source Heat Pump	8	0.23	1,775			

Table D23: Scenario 2 – 2012 - 2014: Renewable energy and low carbon technologies option B.

Renewable energy and low carbon technology	Installed on number of units	CO ₂ savings (t/CO ₂ /yr)	Average cost (£)	Total CO ₂ savings (t/CO ₂ /yr)	Total cost (£)	Percentage cost increase (%)
PV	4	0.68	4,500	5.72	30,500	1.89
Air Source Heat Pump	4	0.58	2,000			

Table D24: Scenario 2 – 2012 - 2014: Renewable energy and low carbon technologies option C.

Renewable energy and low carbon technology	Installed on number of units	CO ₂ savings (t/CO ₂ /yr)	Average cost (£)	Total CO ₂ savings (t/CO ₂ /yr)	Total cost (£)	Percentage cost increase (%)
Solar thermal	2	0.23	850	5.66	41,700	2.59
Biomass boiler	4	1.3	10,000			

2015-2016

There are no residual emissions to be offset from dwellings built to Code for Sustainable Homes Level 6.

D1.4 Development scenario 3

Table D25 (see next page) shows the residual emissions that must be offset as per the Council's renewable energy requirement. The development's total residual emissions drop from 25.09 tonnes of CO₂ per year in 2010 and 2011, to 13.97 tonnes of CO₂ per year between 2012 and 2014, and to zero in 2015 and 2016 as Code Level 6 is met.



Table D25: Scenario 3 carbon dioxide emissions reductions required by renewable energy and low carbon technologies.

Remaining CO₂ emissions (regulated and unregulated) (t per year)						
2010	2011	2012	2013	2014	2015	2016
25.09	25.09	13.97	13.97	13.97	0	0

2010 - 2011

Tables D26 to D28 highlight the renewable energy and low carbon technology options (A, B and C) for offsetting 25.09 tonnes of CO₂ per year in development scenario 3 over the period 2010 to 2011.

Table D26: Scenario 3 – 2010 - 2011: Renewable energy and low carbon technologies option A.

Renewable energy and low carbon technology	Installed on number of units	CO₂ savings (t/CO₂/yr)	Average cost (£)	Total CO₂ savings (t/CO₂/yr)	Total cost (£)	Percentage cost increase (%)
Solar thermal	15	0.23	850	26.59	94,250	5.85
Air Source Heat Pump	28	0.58	2,000			

Table D27: Scenario 3 – 2010 - 2011: Renewable energy and low carbon technologies option B.

Renewable energy and low carbon technology	Installed on number of units	CO₂ savings (t/CO₂/yr)	Average cost (£)	Total CO₂ savings (t/CO₂/yr)	Total cost (£)	Percentage cost increase (%)
PV		0.68	4,500	25.16	166,500	10.35

Table D28: Scenario 3 – 2010 - 2011: Renewable energy and low carbon technologies option C.

Renewable energy and low carbon technology	Installed on number of units	CO₂ savings (t/CO₂/yr)	Average cost (£)	Total CO₂ savings (t/CO₂/yr)	Total cost (£)	Percentage cost increase (%)
PV	9	0.68	4,500	25.62	190,500	11.84
Biomass boiler	15	1.3	10,000			

2012 - 2014

Tables D29 to D31 highlight the renewable energy and low carbon technology options (A, B and C) for offsetting 13.97 tonnes of CO₂ per year in development scenario 3 between 2012 to 2014.

Table D29: Scenario 3 – 2012 - 2014: Renewable energy and low carbon technologies option A.

Renewable energy and low carbon technology	Installed on number of units	CO ₂ savings (t/CO ₂ /yr)	Average cost (£)	Total CO ₂ savings (t/CO ₂ /yr)	Total cost (£)	Percentage cost increase (%)
Solar thermal	25	0.23	850	14.45	51,250	3.18
Air Source Heat Pump	15	0.58	2,000			

Table D30: Scenario 3 – 2012 - 2014: Renewable energy and low carbon technologies option B.

Renewable energy and low carbon technology	Installed on number of units	CO ₂ savings (t/CO ₂ /yr)	Average cost (£)	Total CO ₂ savings (t/CO ₂ /yr)	Total cost (£)	Percentage cost increase (%)
PV	37	0.68	4,500	14.28	94,500	5.87

Table D31: Scenario 3 – 2012 - 2014: Renewable energy and low carbon technologies option C.

Renewable energy and low carbon technology	Installed on number of units	CO ₂ savings (t/CO ₂ /yr)	Average cost (£)	Total CO ₂ savings (t/CO ₂ /yr)	Total cost (£)	Percentage cost increase (%)
Solar thermal	5	0.23	850	14.15	104,250	6.48
Biomass boiler	10	1.3	10,000			

2015-2016

There are no residual emissions to be offset from dwellings built to Code for Sustainable Homes Level 6.



D1.5 Summary

A summary of the results from above can be found in table D32.

Table D32: Summary of costs for Scenario 1 – options A, B and C.

Scenario	Year of implementation	Option	Total CO ₂ savings (t/CO ₂ /yr)	Total cost (£)	Percentage cost increase (%)	Average percentage cost increase (%)	Average percentage cost increase (%)
Scenario 1							
	2010 - 2011	Option A	5.9	24,475	3.7	35,583	5.37
		Option B	5.84	37,775	5.7		
		Option C	5.88	44,500	6.7		
	2012 - 2014	Option A	3.46	12,500	1.89	21,667	3.27
		Option B	3.4	22,500	3.4		
		Option C	3.9	30,000	4.54		
	2015 - 2016	Option A	~	~	~	~	~
		Option B	~	~	~		
		Option C	~	~	~		
Scenario 2							
	2010 - 2011	Option A	10.2	41,850	2.60	60,917	3.78
		Option B	10.2	67,500	4.19		
		Option C	10.02	73,400	4.56		
	2012 - 2014	Option A	5.5	22,700	1.41	31,633	1.96
		Option B	5.72	30,500	1.89		
		Option C	5.66	41,700	2.59		
	2015 - 2016	Option A	~	~	~	~	~
		Option B	~	~	~		
		Option C	~	~	~		
Scenario 3							
	2010 - 2011	Option A	26.59	94,250	5.85	150,417	10.35

	2012 - 2014	Option B	25.16	166,500	10.35	83,333	5.87	
		Option C	25.62	190,500	11.84			
		Option A	14.45	51,250	3.18			
	2015 - 2016	2012 - 2014	Option B	14.28	94,500	5.87	83,333	5.87
			Option C	14.15	104,250	6.48		
			Option A	~	~	~		
		2015 - 2016	Option B	~	~	~	~	~
			Option C	~	~	~		
			Option A	~	~	~		

The additional cost increase of the renewable energy requirement for developments with 10 homes built between 2010 and 2011 averages out at £35,583, or 5.36% of the overall construction costs. This is reduced to £21,667 or 3.27% of the overall construction costs when Code Level 5 is reached between 2012 and 2014. This is due to higher carbon reduction targets being met in higher Code Levels, thus reducing the overall emissions to be met from this policy requirement, which is why there are no residual emissions to be offset from dwellings built to Code for Sustainable Homes Level 6.

The additional cost increase of the renewable energy requirement for developments with 20 homes built between 2010 and 2011 averages out at £60,917, or 3.78% of the overall construction costs. This is reduced to £31,633 or 1.96% of the overall construction costs when Code Level 5 is reached between 2012 and 2014.

The additional cost increase of the renewable energy requirement for developments with 50 homes built between 2010 and 2011 averages out at £150,417, or 9.34% of the overall construction costs. This is reduced to £83,333 or 5.17% of the overall construction costs when Code Level 5 is reached between 2012 and 2014.

Please note that the cost information presented here relates to overall build cost, which increases with the size of development. In addition, costs have been averaged between three different technology options for each scenario (see appendix D for further information). It should also be highlighted that these figures are based on a number of assumptions, and are unable to take into account the technologies already installed under the Code for Sustainable Homes. In addition, developers could install a wide variety of technology combinations for both policy requirements, leading to variations in the overall cost to developments. This broad brush analysis simply gives an indication of the additional financial burden on developers. It is also important to recognise that significant savings can be made through economies of scale, especially on larger sites. Bulk purchase agreements or discounts agreed with manufacturers and suppliers will assist in reducing the financial burden on developers.

In conclusion, assessing a development's baseline emissions in terms of regulated and unregulated emissions and then seeking further reductions through renewable energy and low carbon technologies would, in the view of Impetus and Greenlight Construction, potentially



place an undue burden²⁶ on developers. For example to achieve Code Level 5 developers will need to include a significant element of renewable energy and low carbon technology. To then expect further carbon emission reductions through renewable energy and low carbon technologies would constitute a considerable technical and financial undertaking.

Non-domestic developments

Non-domestic developments have not been assessed due to the variability of energy consumption in speculative developments and of data in relation to non-domestic renewable energy and low carbon technologies. This data is also highly variable and not readily available. However, this rule has been applied widely across the UK and we do not see issues with its implementation in Portsmouth.

²⁶ Please note that there is currently no recognised definition of undue burden in national policy or guidance. Anecdotal evidence suggests that an increase in costs of over 10% is undue. PPS 22 simply requires that policies “should not be framed in such a way as to place an undue burden on developers”. The issue of cost is currently being looked at as part of the consultation on the definition of zero carbon, however this will only relate to the Code for Sustainable Homes, and not developments incorporating BREEAM standards and/or renewable energy requirements. The government is looking at setting a figure of £ per tonne of carbon within the Code as part of ‘allowable solutions’.

APPENDIX E - RENEWABLE ENERGY AND LOW CARBON TECHNOLOGY INSTALLERS AND SUPPLIERS

E1.1 Installers

Impetus made contact with the Environment Centre (tEC) in Southampton regarding renewable energy technology installers operating in the Portsmouth area. While tEC does not hold a list of installers, staff directed us to the Low Carbon Buildings Programme website:

www.lowcarbonbuildings.org.uk/info/installers/. Installers are categorised according to the area(s) that they operate in and by technology.

In addition, details of installers are available from the Green Book Live website: www.greenbooklive.com/search/search.jsp?partid=10013. Installers are categorised according to the area(s) that they operate in and by technology.

Please note there are a large number of installers who operate in the South East but are based elsewhere in the UK.

Due to the number of installers quoted as working in the South East this information has not been included within this study. All of the information on installers can be found online. (Choose a particular technology (solar thermal, micro wind, etc.) from the drop down menu and specifying a particular region, i.e. South East).

E1.2 Biomass suppliers

Information on biomass suppliers can be found on the Log Pile website: www.bigbarn.co.uk/logpile/indexen.php. A search facility can be found on an accompanying page here: www.bigbarn.co.uk/logpile/indexen.php.



APPENDIX F - DISTRICT HEATING AND CHP

Portsmouth City Council should consider the potential benefits of increasing the proportion of energy generated through decentralised energy systems (including those fuelled by renewable energy sources) to reduce CO₂ emissions across the area²⁷. New developments uniquely offer the opportunity to install the heat and electricity infrastructure at the time of construction.

The most common form of decentralised energy supply is community or district heating (from this point forward we will refer to this as district heating). This is where space heating and hot water is delivered to multiple occupants from a local plant via a network of insulated pipes buried in the ground. The pipe network can be installed at the same time as other services (water, drainage, etc.) to minimise costs in new developments. This type of system is also suitable for existing buildings, although a programme of works would be required for retrofitting.

Another option is to use a Combined Heat and Power (CHP) system as part of a district heating scheme. A CHP system generates electricity and uses the heat produced during this process in a productive way, e.g. for local heat loads. The remote generation of electrical power is relatively energy inefficient with typically more than 60% of the energy being lost through transmission losses and waste heat before the electricity reaches buildings. Capturing this 'waste' heat is an important priority across urban areas where it can be used by existing industries or homes to replace increasingly expensively produced process heat. A local decentralised community energy system can help tackle these issues through decreased transmission and distribution losses and by capturing and using the waste heat in buildings of a variety of ways. This is combined heat and power (CHP) via a district heating system.

District heating/CHP systems can be:

- Block-based, with each block in a development having its own communal energy system;
- Site-wide, where a single energy generation source or small number of sources (to suit phased development or demand that varies over time) serves a number of buildings connected by a community energy network; or
- City-scale, as seen in Woking and Southampton.

In the 1960s, district heating/CHP systems received very bad publicity. Although some of them did work effectively and still do, many were inefficient, unreliable, and unable to be controlled on an individual household basis. Modern systems no longer have these problems, and heat can be both controlled and metered.

²⁷ In comparison to conventional power stations, decentralised systems are considerably more efficient. This is because they can capture and use the heat generated from the process, and, in the case of CHP, do not lose as much power in transmission and distribution due to the shorter distances between the energy generation source and the point of use.

APPENDIX G - CODE VIABILITY 2

Impetus and Greenlight Construction met with Portsmouth City Council staff on 31 March 2008. During this meeting there was a discussion about the costs implications to developers as per section 5.1 of this report.

Portsmouth City Council staff requested that different policy options be assessed to ensure that undue burden²⁸ would not be placed on developers. This included a reduction in the requirements of proposed Policy PCS9. The point was also raised that, due to delays in the development of the Council's Core Strategy, the date of implementation for the policy would no longer be 2010, but 2011.

Details of the policy options that have been tested can be found in the sections below. This analysis follows the same methodology and uses the same datasets as outlined in Appendix C.

G1.1 Cost implications of deferred implementation of policy PCS9

This section of the report provides an analysis of the cost implications of delaying the implementation of policy PCS9 until 2011.

Policy PCS9 would therefore require the following Code for Sustainable Homes targets to be met (as shown in table G1):

Table G1: Updated policy implementation timeframe relating to the Code for Sustainable Homes.

Code implementation	Local requirement
Year	All development
2008	
2009	
2010	
2011	Level 4
2012	Level 5
2013	

²⁸ Please note that there is currently no recognised definition of undue burden in national policy or guidance. Anecdotal evidence suggests that an increase in costs of over 10% is undue. PPS 22 simply requires that policies "looked at as part of the consultation on the definition of zero carbon, however this will only relate to the Code for Sustainable Homes, and not developments incorporating BREEAM standards and/or renewable energy requirements. The government is looking at setting a figure of £ per tonne of carbon within the Code as part of 'allowable solutions'". The issue of cost is currently being



Code implementation	Local requirement
Year	All development
2014	
2015	Level 6
2016	

Tables G2 and G3 below show these changes between 2011 and 2016. Table G2 highlights the step change between Portsmouth City Council's PCS9 policy in comparison to national policy in terms of the Code for Sustainable Homes.

Table G2: Code Compliance – requirements of Portsmouth City Council and the Housing and Communities Agency (HCA) (formerly the Housing Corporation and English Partnerships).

Year	Change to Code Level			Private	Social
	PCS9	Building a Greener Future (BGF)	Housing Corporation Design Quality Standards (HCDQS)	BGF to PCS9	HCDQS to PCS9
2010	~	~	~	~	~
2011	4	None	3	None to 4	3 to 4
2012	5	None	4	None to 5	4 to 5
2013	5	None	4	None to 5	4 to 5
2014	5	None	4	None to 5	4 to 5
2015	6	None	6	None to 6	~
2016	6	None	6	None to 6	~

Table G3 (see next page) demonstrates the step change between Portsmouth City Council's PCS9 policy in comparison to national policy in terms of Carbon compliance.

Table G3: Carbon compliance – requirements of Portsmouth City Council and the Housing and Communities Agency (HCA) (formerly the Housing Corporation and English Partnerships).

Year	% improvement on DER			Private	Social
	PCS9	Building a Greener Future (BGF)	Housing Corporation Design Quality Standards (HCDQS)	BGF to PCS9	HCDQS to PCS9
2010	~	~	~	~	~
2011	44%	25%	25%	25% to 44%	25% to 44%
2012	100%	25%	44%	25% to 100%	44% to 100%
2013	100%	44%	44%	44% to 100%	44% to 100%
2014	100%	44%	44%	44% to 100%	44% to 100%
2015	Zero CO ₂	44%	Zero CO ₂	44% to zero CO ₂	~
2016	Zero CO ₂	Zero CO ₂	Zero CO ₂	~	~

Key to tables G2 and G3 above:

DER	Dwelling Emissions Rate (as per Building Regulations ADL1 2006)
PCS9	Portsmouth City Council's Proposed Sustainable Development Policy
BGF	Building A Greener Future 2007 Policy Statement
HCDQS	Housing Corporation Design and Quality Strategy 2007
EP/HC	English Partnerships and the Housing Corporation

Both tables G2 and G3 show that development after 2015 is not affected by the implementation of policy PCS9.

An overall summary of the revised additional development costs can be found below.



Table G4: 2011 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£6,718	£1,639	£8,357	10%
Detached	Market Town	£5,714	£1,639	£7,352	9%
Detached	Urban Regeneration	£2,580	£1,639	£4,218	5%
End Terrace / Semi-Detached	Small Scale	£1,885	£1,787	£3,673	6%
End Terrace / Semi-Detached	Market Town	£3,286	£1,787	£5,073	9%
End Terrace / Semi-Detached	Urban Regeneration	£1,834	£1,787	£3,621	6%
Mid-Terrace	Small Scale	£1,168	£1,787	£2,956	5%
Mid-Terrace	Market Town	£2,395	£1,787	£4,183	7%
Mid-Terrace	Urban Regeneration	£1,512	£1,787	£3,299	6%
Flat	City Infill	£2,335	£656	£2,990	4%
Flat	Market Town	£2,335	£656	£2,990	4%
Flat	Urban Regeneration	£2,074	£656	£2,729	3%

Table G5: 2011 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£6,718	£843	£7,561	9%
Detached	Market Town	£5,714	£843	£6,557	8%
Detached	Urban Regeneration	£2,580	£843	£3,423	4%
End Terrace / Semi-Detached	Small Scale	£1,885	£648	£2,533	4%
End Terrace / Semi-Detached	Market Town	£3,286	£648	£3,934	7%
End Terrace / Semi-Detached	Urban Regeneration	£1,834	£648	£2,482	4%
Mid-Terrace	Small Scale	£1,168	£648	£1,816	3%
Mid-Terrace	Market Town	£2,395	£648	£3,043	5%
Mid-Terrace	Urban Regeneration	£1,512	£648	£2,160	4%
Flat	City Infill	£2,335	£415	£2,749	3%

Flat	Market Town	£2,335	£415	£2,749	3%
Flat	Urban Regeneration	£2,074	£415	£2,488	3%

Table G6: 2012 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£17,081	£4,208	£21,289	27%
Detached	Market Town	£12,213	£4,208	£16,421	20%
Detached	Urban Regeneration	£7,997	£4,208	£12,205	15%
End Terrace / Semi-Detached	Small Scale	£8,641	£4,613	£13,254	23%
End Terrace / Semi-Detached	Market Town	£7,981	£4,613	£12,594	22%
End Terrace / Semi-Detached	Urban Regeneration	£5,740	£4,613	£10,352	18%
Mid-Terrace	Small Scale	£7,377	£4,613	£11,990	21%
Mid-Terrace	Market Town	£6,483	£4,613	£11,095	20%
Mid-Terrace	Urban Regeneration	£4,910	£4,613	£9,523	17%
Flat	City Infill	£8,720	£1,738	£10,458	13%
Flat	Market Town	£6,774	£1,738	£8,512	11%
Flat	Urban Regeneration	£5,218	£1,738	£6,956	9%

Table G7: 2012 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,433	£2,607	£13,040	16%
Detached	Market Town	£6,558	£2,607	£9,165	11%
Detached	Urban Regeneration	£5,444	£2,607	£8,051	10%
End Terrace / Semi-Detached	Small Scale	£6,776	£2,867	£9,643	17%
End Terrace / Semi-Detached	Market Town	£4,729	£2,867	£7,596	13%
End Terrace / Semi-Detached	Urban Regeneration	£3,925	£2,867	£6,792	12%
Mid-Terrace	Small Scale	£6,221	£2,867	£9,089	16%



Mid-Terrace	Market Town	£4,112	£2,867	£6,980	12%
Mid-Terrace	Urban Regeneration	£3,414	£2,867	£6,281	11%
Flat	City Infill	£6,410	£1,104	£7,513	9%
Flat	Market Town	£4,463	£1,104	£5,567	7%
Flat	Urban Regeneration	£3,166	£1,104	£4,269	5%

Table G8: 2013 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,318	£4,039	£14,357	18%
Detached	Market Town	£6,486	£4,039	£10,525	13%
Detached	Urban Regeneration	£5,384	£4,039	£9,423	12%
End Terrace / Semi-Detached	Small Scale	£6,701	£4,425	£11,127	20%
End Terrace / Semi-Detached	Market Town	£4,677	£4,425	£9,102	16%
End Terrace / Semi-Detached	Urban Regeneration	£3,882	£4,425	£8,307	15%
Mid-Terrace	Small Scale	£6,153	£4,425	£10,579	19%
Mid-Terrace	Market Town	£4,067	£4,425	£8,492	15%
Mid-Terrace	Urban Regeneration	£3,376	£4,425	£7,802	14%
Flat	City Infill	£6,340	£1,659	£7,999	10%
Flat	Market Town	£4,414	£1,659	£6,073	8%
Flat	Urban Regeneration	£3,131	£1,659	£4,790	6%

Table G9: 2013 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,318	£2,475	£12,793	16%
Detached	Market Town	£6,486	£2,475	£8,960	11%
Detached	Urban Regeneration	£5,384	£2,475	£7,859	10%
End Terrace / Semi-Detached	Small Scale	£6,701	£2,722	£9,423	17%

End Terrace / Semi-Detached	Market Town	£4,677	£2,722	£7,398	13%
End Terrace / Semi-Detached	Urban Regeneration	£3,882	£2,722	£6,603	12%
Mid-Terrace	Small Scale	£6,153	£2,722	£8,875	16%
Mid-Terrace	Market Town	£4,067	£2,722	£6,789	12%
Mid-Terrace	Urban Regeneration	£3,376	£2,722	£6,098	11%
Flat	City Infill	£6,340	£1,046	£7,385	9%
Flat	Market Town	£4,414	£1,046	£5,460	7%
Flat	Urban Regeneration	£3,131	£1,046	£4,176	5%

Table G10: 2014 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,089	£3,912	£14,002	17%
Detached	Market Town	£6,340	£3,912	£10,252	13%
Detached	Urban Regeneration	£5,263	£3,912	£9,176	11%
End Terrace / Semi-Detached	Small Scale	£6,553	£4,285	£10,838	19%
End Terrace / Semi-Detached	Market Town	£4,572	£4,285	£8,857	16%
End Terrace / Semi-Detached	Urban Regeneration	£3,795	£4,285	£8,079	14%
Mid-Terrace	Small Scale	£6,017	£4,285	£10,302	18%
Mid-Terrace	Market Town	£3,976	£4,285	£8,261	15%
Mid-Terrace	Urban Regeneration	£3,301	£4,285	£7,586	13%
Flat	City Infill	£6,200	£1,600	£7,800	10%
Flat	Market Town	£4,316	£1,600	£5,916	7%
Flat	Urban Regeneration	£3,061	£1,600	£4,660	6%



Table G11: 2014 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,089	£2,385	£12,474	16%
Detached	Market Town	£6,340	£2,385	£8,725	11%
Detached	Urban Regeneration	£5,263	£2,385	£7,648	10%
End Terrace / Semi-Detached	Small Scale	£6,553	£2,623	£9,176	16%
End Terrace / Semi-Detached	Market Town	£4,572	£2,623	£7,195	13%
End Terrace / Semi-Detached	Urban Regeneration	£3,795	£2,623	£6,418	11%
Mid-Terrace	Small Scale	£6,017	£2,623	£8,640	15%
Mid-Terrace	Market Town	£3,976	£2,623	£6,599	12%
Mid-Terrace	Urban Regeneration	£3,301	£2,623	£5,924	10%
Flat	City Infill	£6,200	£1,008	£7,207	9%
Flat	Market Town	£4,316	£1,008	£5,324	7%
Flat	Urban Regeneration	£3,061	£1,008	£4,068	5%

Table G12: 2015 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£20,642	£3,647	£24,288	30%
Detached	Market Town	£15,912	£3,647	£19,558	24%
Detached	Urban Regeneration	£16,172	£3,647	£19,819	25%
End Terrace / Semi-Detached	Small Scale	£16,988	£4,558	£21,545	38%
End Terrace / Semi-Detached	Market Town	£12,390	£4,558	£16,948	30%
End Terrace / Semi-Detached	Urban Regeneration	£12,563	£4,558	£17,121	30%
Mid-Terrace	Small Scale	£17,500	£4,558	£22,057	39%
Mid-Terrace	Market Town	£13,139	£4,558	£17,696	31%
Mid-Terrace	Urban Regeneration	£13,220	£4,558	£17,778	31%
Flat	City Infill	£9,408	£1,590	£10,998	14%

Flat	Market Town	£9,838	£1,590	£11,428	14%
Flat	Urban Regeneration	£8,397	£1,590	£9,988	12%

Table G13: 2015 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£0	£0	0%
Detached	Market Town	£0	£0	£0	0%
Detached	Urban Regeneration	£0	£0	£0	0%
End Terrace / Semi-Detached	Small Scale	£0	£0	£0	0%
End Terrace / Semi-Detached	Market Town	£0	£0	£0	0%
End Terrace / Semi-Detached	Urban Regeneration	£0	£0	£0	0%
Mid-Terrace	Small Scale	£0	£0	£0	0%
Mid-Terrace	Market Town	£0	£0	£0	0%
Mid-Terrace	Urban Regeneration	£0	£0	£0	0%
Flat	City Infill	£0	£0	£0	0%
Flat	Market Town	£0	£0	£0	0%
Flat	Urban Regeneration	£0	£0	£0	0%

Table G14: 2016 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£3,418	£3,418	4%
Detached	Market Town	£0	£3,418	£3,418	4%
Detached	Urban Regeneration	£0	£3,418	£3,418	4%
End Terrace / Semi-Detached	Small Scale	£0	£4,263	£4,263	8%
End Terrace / Semi-Detached	Market Town	£0	£4,263	£4,263	8%
End Terrace / Semi-Detached	Urban Regeneration	£0	£4,263	£4,263	8%
Mid-Terrace	Small Scale	£0	£4,263	£4,263	8%



Mid-Terrace	Market Town	£0	£4,263	£4,263	8%
Mid-Terrace	Urban Regeneration	£0	£4,263	£4,263	8%
Flat	City Infill	£0	£1,475	£1,475	2%
Flat	Market Town	£0	£1,475	£1,475	2%
Flat	Urban Regeneration	£0	£1,475	£1,475	2%

Table G15: 2016 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£0	£0	0%
Detached	Market Town	£0	£0	£0	0%
Detached	Urban Regeneration	£0	£0	£0	0%
End Terrace / Semi-Detached	Small Scale	£0	£0	£0	0%
End Terrace / Semi-Detached	Market Town	£0	£0	£0	0%
End Terrace / Semi-Detached	Urban Regeneration	£0	£0	£0	0%
Mid-Terrace	Small Scale	£0	£0	£0	0%
Mid-Terrace	Market Town	£0	£0	£0	0%
Mid-Terrace	Urban Regeneration	£0	£0	£0	0%
Flat	City Infill	£0	£0	£0	0%
Flat	Market Town	£0	£0	£0	0%
Flat	Urban Regeneration	£0	£0	£0	0%

Please note that all costings information within tables G2 to G15 is based on an assumed low ecological site value and no financial requirement to mitigate flood risk.

These results have been summarised in tables G16 and G17. G16 refers to the increased cost of dwellings that are privately funded, while G17 refers to the increased cost of dwellings that are publicly funded.

Table G16: Additional development costs summary of privately funded dwellings.

Dwelling type	Development scenario	2011	2012	2013	2014	2015	2016
Detached	Small Scale	£8,357	£21,289	£14,357	£14,002	£24,288	£3,418
Detached	Market Town	£7,352	£16,421	£10,525	£10,252	£19,558	£3,418
Detached	Urban Regeneration	£4,218	£12,205	£9,423	£9,176	£19,819	£3,418
End Terrace / Semi-Detached	Small Scale	£3,673	£13,254	£11,127	£10,838	£21,545	£4,263
End Terrace / Semi-Detached	Market Town	£5,073	£12,594	£9,102	£8,857	£16,948	£4,263
End Terrace / Semi-Detached	Urban Regeneration	£3,621	£10,352	£8,307	£8,079	£17,121	£4,263
Mid-Terrace	Small Scale	£2,956	£11,990	£10,579	£10,302	£22,057	£4,263
Mid-Terrace	Market Town	£4,183	£11,095	£8,492	£8,261	£17,696	£4,263
Mid-Terrace	Urban Regeneration	£3,299	£9,523	£7,802	£7,586	£17,778	£4,263
Flat	City Infill	£2,990	£10,458	£7,999	£7,800	£10,998	£1,475
Flat	Market Town	£2,990	£8,512	£6,073	£5,916	£11,428	£1,475
Flat	Urban Regeneration	£2,729	£6,956	£4,790	£4,660	£9,988	£1,475
	Average	£4,287	£12,054	£9,048	£8,811	£17,435	£3,355

Table G17: Additional development costs summary of publicly funded dwellings.

Dwelling type	Development scenario	2011	2012	2013	2014	2015	2016
Detached	Small Scale	£7,561	£13,040	£12,793	£12,474	£0	£0
Detached	Market Town	£6,557	£9,165	£8,960	£8,725	£0	£0
Detached	Urban Regeneration	£3,423	£8,051	£7,859	£7,648	£0	£0
End Terrace / Semi-Detached	Small Scale	£2,533	£9,643	£9,423	£9,176	£0	£0
End Terrace / Semi-Detached	Market Town	£3,934	£7,596	£7,398	£7,195	£0	£0
End Terrace / Semi-Detached	Urban Regeneration	£2,482	£6,792	£6,603	£6,418	£0	£0
Mid-Terrace	Small Scale	£1,816	£9,089	£8,875	£8,640	£0	£0
Mid-Terrace	Market Town	£3,043	£6,980	£6,789	£6,599	£0	£0
Mid-Terrace	Urban Regeneration	£2,160	£6,281	£6,098	£5,924	£0	£0
Flat	City Infill	£2,749	£7,513	£7,385	£7,207	£0	£0



Flat	Market Town	£2,749	£5,567	£5,460	£5,324	£0	£0
Flat	Urban Regeneration	£2,488	£4,269	£4,176	£4,068	£0	£0
	Average	£3,458	£7,832	£7,652	£7,450	£0	£0

G1.1.1 Summary – predicted cost impact with forecasted growth

As can be seen in tables G16 and G17 above, the average cost to developers of both private and publicly funded development increases and decreases as development moves towards zero carbon.

Privately funded developments see two large increases with the shift to Code Level 5 and Code Level 6. This is due to the large increase in carbon reduction from Code Levels 4 to 5 (a further 127% reduction in regulated emissions) and Code Levels 5 to 6 (the elimination of the remaining residual emissions). While additional costs are over 10%, potentially placing a developer under undue burden, it is important to highlight that there is no official definition of undue burden²⁹ and the consultation on the definition of zero carbon. The issue of cost has been raised within the consultation, with the government looking at setting a figure of £ per tonne of carbon as part of ‘allowable solutions’.

Publicly funded developments also see a relatively large increase in costs with the shift to Code Level 5 in 2012, although developers then follow the Homes and Communities Agency’s (HCA) mandatory timetable from 2015. This means that in 2015 and 2016, policy PCS9 would not increase the financial burden on developers since the standards are mandatory for such developments.

Taking into account the average cost of construction (as per the Q4 2007 pricing levels, averaged across the four dwelling types), the results in the following percentage cost increase for developers.

Privately funded developments:

- 2011 – 6.26%
- 2012 – 17.60%
- 2013 – 13.21%
- 2014 – 12.87%
- 2015 – 25.45%
- 2016 – 4.89%

Publicly funded developments:

- 2011 – 5.05%

²⁹ Please note that there is currently no recognised definition of undue burden in national policy or guidance. Anecdotal evidence suggests that an increase in costs of over 10% is undue. PPS 22 simply requires that policies “

2012 – 11.43%
2013 – 11.17%
2014 – 10.87%
2015 – 0%
2016 – 0%

The additional cost figures above are the same as those within Appendix C, minus the figure for 2010. This is because the policy implementation of the Code for Sustainable Homes follows the same timetable from 2011 and beyond. Deferring policy PCS9 has therefore not had any effect on the financial impact of this policy requirement.

It is important to recognise that the additional cost to publicly funded development is less than privately funded development. This is due to Policy PCS9 matching national policy requirements for publicly funded development. On average, the additional cost to privately funded development is 13.3% between 2011 and 2016. The average additional cost to publicly funded development over the same period is 6.4%.

As highlighted in section 5.1 and Appendix C, Impetus and Greenlight Construction have concerns that the additional costs to developers, particularly those increases above 10%, could be considered an undue financial burden on developers. This is especially true for major developments (classified as 10 or more dwellings), which will have additional financial burden placed in them by the policy's renewable energy requirement.

A review of these additional costs in comparison to the other revised policy options can be found in section G1.3 below.

G1.2 Cost implications of revised implementation of policy PCS9

Even with the deferred implementation of policy PCS9, the additional cost to developers could still be considered undue. However there are several options open to Portsmouth City Council to ensure that the sustainability aims of policy PCS9 are met:

- Option 1: Reduce the overall Code for Sustainable Homes rating on new developments from Level 4 to Level 3;
- Option 2: Reduce the overall Code for Sustainable Homes rating on new developments from Level 4 to Level 3, but still require higher energy standards associated with higher Levels of the Code; or
- Option 3: Reduce the overall Code for Sustainable Homes rating on new developments from Level 4 to Level 3, but still require higher energy and water standards associated with higher Levels of the Code.

This section of the report provides an analysis of the cost implications of these three options.



G1.2.1 Option 1: Meeting Code Level 3

Table G18 outlines the revised implementation timetable in relation to the Code for Sustainable Homes. This would mean that policy PCS9 would introduce Code Level 3 in 2011.

Table G18: Updated policy implementation timeframe relating to the Code for Sustainable Homes.

Code implementation	Local requirements
Year	All development
2008	
2009	
2010	
2011	Level 3
2012	
2013	Level 4
2014	
2015	Level 5
2016	Level 6

Tables G19 and G20 below highlight these changes between 2011 and 2016.

Table G19 highlights the step change between Portsmouth City Council's PCS9 policy in comparison to national policy in terms of the Code for Sustainable Homes.

Table G19: Code Compliance – requirements of Portsmouth City Council and the Housing and Communities Agency (HCA) (formerly the Housing Corporation and English Partnerships).

Year	Change to Code Level			Private	Social
	PCS9	Building a Greener Future (BGF)	Housing Corporation Design Quality Standards (HCDQS)	BGF to PCS9	HCDQS to PCS9
2010	~	~	~	~	~

2011	3	None	3	None to 3	~
2012	3	None	4	None to 3	~
2013	4	None	4	None to 4	~
2014	4	None	4	None to 4	~
2015	5	None	6	None to 5	~
2016	6	None	6	None to 6	~

Table G20 highlights the step change between Portsmouth City Council's PCS9 policy in comparison to national policy in terms of Carbon compliance.

Table G20: Carbon compliance – requirements of Portsmouth City Council and the Housing and Communities Agency (HCA) (formerly the Housing Corporation and English Partnerships).

Year	% improvement on DER			Private	Social
	PCS9	Building a Greener Future (BGF)	Housing Corporation Design Quality Standards (HCDQS)	BGF to PCS9	HCDQS to PCS9
2010	~	~	~	~	~
2011	25%	25%	25%	~	~
2012	25%	25%	44%	~	~
2013	44%	44%	44%	~	~
2014	44%	44%	44%	~	~
2015	100%	44%	Zero CO ₂	44% to 100%	~
2016	Zero CO ₂	Zero CO ₂	Zero CO ₂	~	~

Key to tables G2 and G3 above:

DER Dwelling Emissions Rate (as per Building Regulations ADL1 2006)
 PCS9 Portsmouth City Council's Proposed Sustainable Development Policy



An overall summary of the revised additional development costs can be found below.

Table G21: 2011 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£787	£787	1%
Detached	Market Town	£0	£787	£787	1%
Detached	Urban Regeneration	£0	£787	£787	1%
End Terrace / Semi-Detached	Small Scale	£0	£1,131	£1,131	2%
End Terrace / Semi-Detached	Market Town	£0	£1,131	£1,131	2%
End Terrace / Semi-Detached	Urban Regeneration	£0	£1,131	£1,131	2%
Mid-Terrace	Small Scale	£0	£1,131	£1,131	2%
Mid-Terrace	Market Town	£0	£1,131	£1,131	2%
Mid-Terrace	Urban Regeneration	£0	£1,131	£1,131	2%
Flat	City Infill	£0	£232	£232	0%
Flat	Market Town	£0	£232	£232	0%
Flat	Urban Regeneration	£0	£232	£232	0%

Table G22: 2011 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£0	£0	0%
Detached	Market Town	£0	£0	£0	0%
Detached	Urban Regeneration	£0	£0	£0	0%
End Terrace / Semi-Detached	Small Scale	£0	£0	£0	0%
End Terrace / Semi-Detached	Market Town	£0	£0	£0	0%

End Terrace / Semi-Detached	Urban Regeneration	£0	£0	£0	0%
Mid-Terrace	Small Scale	£0	£0	£0	0%
Mid-Terrace	Market Town	£0	£0	£0	0%
Mid-Terrace	Urban Regeneration	£0	£0	£0	0%
Flat	City Infill	£0	£0	£0	0%
Flat	Market Town	£0	£0	£0	0%
Flat	Urban Regeneration	£0	£0	£0	0%

Table G23: 2012 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£759	£759	1%
Detached	Market Town	£0	£759	£759	1%
Detached	Urban Regeneration	£0	£759	£759	1%
End Terrace / Semi-Detached	Small Scale	£0	£1,093	£1,093	2%
End Terrace / Semi-Detached	Market Town	£0	£1,093	£1,093	2%
End Terrace / Semi-Detached	Urban Regeneration	£0	£1,093	£1,093	2%
Mid-Terrace	Small Scale	£0	£1,093	£1,093	2%
Mid-Terrace	Market Town	£0	£1,093	£1,093	2%
Mid-Terrace	Urban Regeneration	£0	£1,093	£1,093	2%
Flat	City Infill	£0	£211	£211	0%
Flat	Market Town	£0	£211	£211	0%
Flat	Urban Regeneration	£0	£211	£211	0%

Table G24: 2012 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£0	£0	0%
Detached	Market Town	£0	£0	£0	0%



Detached	Urban Regeneration	£0	£0	£0	0%
End Terrace / Semi-Detached	Small Scale	£0	£0	£0	0%
End Terrace / Semi-Detached	Market Town	£0	£0	£0	0%
End Terrace / Semi-Detached	Urban Regeneration	£0	£0	£0	0%
Mid-Terrace	Small Scale	£0	£0	£0	0%
Mid-Terrace	Market Town	£0	£0	£0	0%
Mid-Terrace	Urban Regeneration	£0	£0	£0	0%
Flat	City Infill	£0	£0	£0	0%
Flat	Market Town	£0	£0	£0	0%
Flat	Urban Regeneration	£0	£0	£0	0%

Table G25: 2013 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£1,564	£1,564	2%
Detached	Market Town	£0	£1,564	£1,564	2%
Detached	Urban Regeneration	£0	£1,564	£1,564	2%
End Terrace / Semi-Detached	Small Scale	£0	£1,704	£1,704	3%
End Terrace / Semi-Detached	Market Town	£0	£1,704	£1,704	3%
End Terrace / Semi-Detached	Urban Regeneration	£0	£1,704	£1,704	3%
Mid-Terrace	Small Scale	£0	£1,704	£1,704	3%
Mid-Terrace	Market Town	£0	£1,704	£1,704	3%
Mid-Terrace	Urban Regeneration	£0	£1,704	£1,704	3%
Flat	City Infill	£0	£613	£613	1%
Flat	Market Town	£0	£613	£613	1%
Flat	Urban Regeneration	£0	£613	£613	1%

Table G26: 2013 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance	Code compliance	Combined (£)	% increase in costs
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		(£)	(£)		
Detached	Small Scale	£0	£0	£0	0%
Detached	Market Town	£0	£0	£0	0%
Detached	Urban Regeneration	£0	£0	£0	0%
End Terrace / Semi-Detached	Small Scale	£0	£0	£0	0%
End Terrace / Semi-Detached	Market Town	£0	£0	£0	0%
End Terrace / Semi-Detached	Urban Regeneration	£0	£0	£0	0%
Mid-Terrace	Small Scale	£0	£0	£0	0%
Mid-Terrace	Market Town	£0	£0	£0	0%
Mid-Terrace	Urban Regeneration	£0	£0	£0	0%
Flat	City Infill	£0	£0	£0	0%
Flat	Market Town	£0	£0	£0	0%
Flat	Urban Regeneration	£0	£0	£0	0%

Table G27: 2014 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£1,527	£1,527	2%
Detached	Market Town	£0	£1,527	£1,527	2%
Detached	Urban Regeneration	£0	£1,527	£1,527	2%
End Terrace / Semi-Detached	Small Scale	£0	£1,662	£1,662	3%
End Terrace / Semi-Detached	Market Town	£0	£1,662	£1,662	3%
End Terrace / Semi-Detached	Urban Regeneration	£0	£1,662	£1,662	3%
Mid-Terrace	Small Scale	£0	£1,662	£1,662	3%
Mid-Terrace	Market Town	£0	£1,662	£1,662	3%
Mid-Terrace	Urban Regeneration	£0	£1,662	£1,662	3%
Flat	City Infill	£0	£592	£592	1%
Flat	Market Town	£0	£592	£592	1%
Flat	Urban Regeneration	£0	£592	£592	1%



Table G28: 2014 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£0	£0	0%
Detached	Market Town	£0	£0	£0	0%
Detached	Urban Regeneration	£0	£0	£0	0%
End Terrace / Semi-Detached	Small Scale	£0	£0	£0	0%
End Terrace / Semi-Detached	Market Town	£0	£0	£0	0%
End Terrace / Semi-Detached	Urban Regeneration	£0	£0	£0	0%
Mid-Terrace	Small Scale	£0	£0	£0	0%
Mid-Terrace	Market Town	£0	£0	£0	0%
Mid-Terrace	Urban Regeneration	£0	£0	£0	0%
Flat	City Infill	£0	£0	£0	0%
Flat	Market Town	£0	£0	£0	0%
Flat	Urban Regeneration	£0	£0	£0	0%

Table G29: 2015 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£9,751	£3,743	£13,494	17%
Detached	Market Town	£6,096	£3,743	£9,840	12%
Detached	Urban Regeneration	£5,061	£3,743	£8,804	11%
End Terrace / Semi-Detached	Small Scale	£6,346	£4,097	£10,444	18%
End Terrace / Semi-Detached	Market Town	£4,396	£4,097	£8,493	15%
End Terrace / Semi-Detached	Urban Regeneration	£3,648	£4,097	£7,746	14%
Mid-Terrace	Small Scale	£5,830	£4,097	£9,927	18%
Mid-Terrace	Market Town	£3,823	£4,097	£7,920	14%
Mid-Terrace	Urban Regeneration	£3,173	£4,097	£7,271	13%

Flat	City Infill	£6,009	£1,521	£7,530	9%
Flat	Market Town	£4,167	£1,521	£5,688	7%
Flat	Urban Regeneration	£2,943	£1,521	£4,463	6%

Table G30: 2015 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£0	£0	0%
Detached	Market Town	£0	£0	£0	0%
Detached	Urban Regeneration	£0	£0	£0	0%
End Terrace / Semi-Detached	Small Scale	£0	£0	£0	0%
End Terrace / Semi-Detached	Market Town	£0	£0	£0	0%
End Terrace / Semi-Detached	Urban Regeneration	£0	£0	£0	0%
Mid-Terrace	Small Scale	£0	£0	£0	0%
Mid-Terrace	Market Town	£0	£0	£0	0%
Mid-Terrace	Urban Regeneration	£0	£0	£0	0%
Flat	City Infill	£0	£0	£0	0%
Flat	Market Town	£0	£0	£0	0%
Flat	Urban Regeneration	£0	£0	£0	0%

Table G31: 2016 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£3,418	£3,418	4%
Detached	Market Town	£0	£3,418	£3,418	4%
Detached	Urban Regeneration	£0	£3,418	£3,418	4%
End Terrace / Semi-Detached	Small Scale	£0	£4,263	£4,263	8%
End Terrace / Semi-Detached	Market Town	£0	£4,263	£4,263	8%
End Terrace / Semi-Detached	Urban Regeneration	£0	£4,263	£4,263	8%



Mid-Terrace	Small Scale	£0	£4,263	£4,263	8%
Mid-Terrace	Market Town	£0	£4,263	£4,263	8%
Mid-Terrace	Urban Regeneration	£0	£4,263	£4,263	8%
Flat	City Infill	£0	£1,475	£1,475	2%
Flat	Market Town	£0	£1,475	£1,475	2%
Flat	Urban Regeneration	£0	£1,475	£1,475	2%

Table G32: 2016 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£0	£0	0%
Detached	Market Town	£0	£0	£0	0%
Detached	Urban Regeneration	£0	£0	£0	0%
End Terrace / Semi-Detached	Small Scale	£0	£0	£0	0%
End Terrace / Semi-Detached	Market Town	£0	£0	£0	0%
End Terrace / Semi-Detached	Urban Regeneration	£0	£0	£0	0%
Mid-Terrace	Small Scale	£0	£0	£0	0%
Mid-Terrace	Market Town	£0	£0	£0	0%
Mid-Terrace	Urban Regeneration	£0	£0	£0	0%
Flat	City Infill	£0	£0	£0	0%
Flat	Market Town	£0	£0	£0	0%
Flat	Urban Regeneration	£0	£0	£0	0%

Please note that all costings information within tables G23 to G32 is based on an assumed low ecological site value and no financial requirement to mitigate flood risk.

These results have been summarised in tables G33 and G34. G33 refers to the increased cost of dwellings that are privately funded, while G34 refers to the increased cost of dwellings that are publically funded.

Table G33: Additional development costs summary of privately funded dwellings.

Dwelling type	Development scenario	2011	2012	2013	2014	2015	2016
Detached	Small Scale	£787	£759	£1,564	£1,527	£13,494	£3,418
Detached	Market Town	£787	£759	£1,564	£1,527	£9,840	£3,418
Detached	Urban Regeneration	£787	£759	£1,564	£1,527	£8,804	£3,418
End Terrace / Semi-Detached	Small Scale	£1,131	£1,093	£1,704	£1,662	£10,444	£4,263
End Terrace / Semi-Detached	Market Town	£1,131	£1,093	£1,704	£1,662	£8,493	£4,263
End Terrace / Semi-Detached	Urban Regeneration	£1,131	£1,093	£1,704	£1,662	£7,746	£4,263
Mid-Terrace	Small Scale	£1,131	£1,093	£1,704	£1,662	£9,927	£4,263
Mid-Terrace	Market Town	£1,131	£1,093	£1,704	£1,662	£7,920	£4,263
Mid-Terrace	Urban Regeneration	£1,131	£1,093	£1,704	£1,662	£7,271	£4,263
Flat	City Infill	£232	£211	£613	£592	£7,530	£1,475
Flat	Market Town	£232	£211	£613	£592	£5,688	£1,475
Flat	Urban Regeneration	£232	£211	£613	£592	£4,463	£1,475
	Average	£820	£789	£1,396	£1,361	£8,468	£3,355

Table G34: Additional development costs summary of publicly funded dwellings.

Dwelling type	Development scenario	2011	2012	2013	2014	2015	2016
Detached	Small Scale	£0	£0	£0	£0	£0	£0
Detached	Market Town	£0	£0	£0	£0	£0	£0
Detached	Urban Regeneration	£0	£0	£0	£0	£0	£0
End Terrace / Semi-Detached	Small Scale	£0	£0	£0	£0	£0	£0
End Terrace / Semi-Detached	Market Town	£0	£0	£0	£0	£0	£0
End Terrace / Semi-Detached	Urban Regeneration	£0	£0	£0	£0	£0	£0
Mid-Terrace	Small Scale	£0	£0	£0	£0	£0	£0
Mid-Terrace	Market Town	£0	£0	£0	£0	£0	£0
Mid-Terrace	Urban Regeneration	£0	£0	£0	£0	£0	£0
Flat	City Infill	£0	£0	£0	£0	£0	£0



Flat	Market Town	£0	£0	£0	£0	£0	£0
Flat	Urban Regeneration	£0	£0	£0	£0	£0	£0
	Average	£0	£0	£0	£0	£0	£0

Summary

As can be seen in table G33 above, the average cost to developers of private funded development increases and decreases as development moves towards zero carbon.

Privately funded developments will see an increase in cost with the shift to Code Level 5 in 2015. This is due to the large increase in carbon reduction (a further 127% reduction in regulated emissions) required. While additional costs are over 10% in 2015, potentially placing a developer under undue burden, it is important to highlight that there is no official definition of undue burden³⁰ and the consultation on the definition of zero carbon. The issue of cost has been raised within the consultation, with the government looking at setting a figure of £ per tonne of carbon as part of 'allowable solutions'.

Publicly funded developments do not see any increase in costs since they will already be obliged to follow the Homes and Communities Agency's (HCA) mandatory timetable.

Another interesting by-product is that Lifetime Homes would not become mandatory for all dwellings until 2013. The original PCS9 policy requirements would have meant that this standard would have become mandatory from 2010.

Taking into account the average cost of construction (as per the Q4 2007 pricing levels, averaged across the four dwelling types), this results in the following percentage cost increase for developers.

Privately funded developments:

- 2011 – 1.2%
- 2012 – 1.15%
- 2013 – 2.04%
- 2014 – 1.99%
- 2015 – 12.79%
- 2016 – 4.90%

Publicly funded developments:

- 2011 – 0%

³⁰ Please note that there is currently no recognised definition of undue burden in national policy or guidance. Anecdotal evidence suggests that an increase in costs of over 10% is undue. PPS 22 simply requires that policies “ ”.

2012 – 0%
 2013 – 0%
 2014 – 0%
 2015 – 0%
 2016 – 0%

On average, the additional cost to privately funded development is 3.9% between 2011 and 2016, while there is no additional cost to publicly funded development.

A review of these additional costs in comparison to the other revised policy options can be found in section G1.3 below.

G1.2.2 Option 2: Meeting Code Level 3, plus higher energy standards

The relaxed Code requirements (Level 3) have been re-analysed with an additional allowance for carbon compliance at one level above the national standards as set out in 'Building A Greener Future'. This is to allow Portsmouth City Council to demonstrate their desire to explore the boundaries of sustainable development without placing an undue burden on developers.

Tables G35 and G36 below highlight these changes between 2011 and 2016.

Table G35 highlights the step change between Portsmouth City Council's PCS9 policy in comparison to national policy in terms of the Code for Sustainable Homes.

Table G35: Code Compliance – requirements of Portsmouth City Council and the Housing and Communities Agency (HCA) (formerly the Housing Corporation and English Partnerships).

Year	Change to Code Level			Private	Social
	PCS9	Building a Greener Future (BGF)	Housing Corporation Design Quality Standards (HCDQS)	BGF to PCS9	HCDQS to PCS9
2010	~	~	~	~	~
2011	3	None	3	None to 3	~
2012	3	None	4	None to 3	~



2013	4	None	4	None to 4	~
2014	4	None	4	None to 4	~
2015	5	None	6	None to 5	~
2016	6	None	6	None to 6	~

Table G36 highlights the step change between Portsmouth City Council's PCS9 policy in comparison to national policy in terms of Carbon compliance.

Table G36: Carbon compliance – requirements of Portsmouth City Council and the Housing and Communities Agency (HCA) (formerly the Housing Corporation and English Partnerships).

Year	% improvement on DER			Private	Social
	PCS9	Building a Greener Future (BGF)	Housing Corporation Design Quality Standards (HCDQS)	BGF to PCS9	HCDQS to PCS9
2010	~	~	~	~	~
2011	44%	25%	25%	25% to 44%	25% to 44%
2012	44%	25%	44%	25% to 44%	~
2013	100%	44%	44%	44% to 100%	44% to 100%
2014	100%	44%	44%	44% to 100%	44% to 100%
2015	100%	44%	ZERO CO ₂	44% to 100%	~
2016	ZERO CO ₂	ZERO CO ₂	ZERO CO ₂	~	~

Key to tables G2 and G3 above:

DER Dwelling Emissions Rate (as per Building Regulations ADL1 2006)
 PCS9 Portsmouth City Council's Proposed Sustainable Development Policy
 BGF Building A Greener Future 2007 Policy Statement
 HCDQS Housing Corporation Design and Quality Strategy 2007
 EP/HC English Partnerships and the Housing Corporation

An overall summary of the revised additional development costs can be found below.

Table G37: 2011 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£6,718	£787	£7,505	9%
Detached	Market Town	£5,714	£787	£6,501	8%
Detached	Urban Regeneration	£2,580	£787	£3,366	4%
End Terrace / Semi-Detached	Small Scale	£1,885	£1,131	£3,016	5%
End Terrace / Semi-Detached	Market Town	£3,286	£1,131	£4,417	8%
End Terrace / Semi-Detached	Urban Regeneration	£1,834	£1,131	£2,964	5%
Mid-Terrace	Small Scale	£1,168	£1,131	£2,299	4%
Mid-Terrace	Market Town	£2,395	£1,131	£3,526	6%
Mid-Terrace	Urban Regeneration	£1,512	£1,131	£2,643	5%
Flat	City Infill	£2,335	£232	£2,567	3%
Flat	Market Town	£2,335	£232	£2,567	3%
Flat	Urban Regeneration	£2,074	£232	£2,306	3%

Table G38: 2011 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£6,718	£0	£6,718	8%
Detached	Market Town	£5,714	£0	£5,714	7%
Detached	Urban Regeneration	£2,580	£0	£2,580	3%
End Terrace / Semi-Detached	Small Scale	£1,885	£0	£1,885	3%
End Terrace / Semi-Detached	Market Town	£3,286	£0	£3,286	6%
End Terrace / Semi-Detached	Urban Regeneration	£1,834	£0	£1,834	3%
Mid-Terrace	Small Scale	£1,168	£0	£1,168	2%



Mid-Terrace	Market Town	£2,395	£0	£2,395	4%
Mid-Terrace	Urban Regeneration	£1,512	£0	£1,512	3%
Flat	City Infill	£2,335	£0	£2,335	3%
Flat	Market Town	£2,335	£0	£2,335	3%
Flat	Urban Regeneration	£2,074	£0	£2,074	3%

Table G39: 2012 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£6,648	£759	£7,407	9%
Detached	Market Town	£5,654	£759	£6,414	8%
Detached	Urban Regeneration	£2,553	£759	£3,312	4%
End Terrace / Semi-Detached	Small Scale	£1,866	£1,093	£2,959	5%
End Terrace / Semi-Detached	Market Town	£3,252	£1,093	£4,345	8%
End Terrace / Semi-Detached	Urban Regeneration	£1,815	£1,093	£2,908	5%
Mid-Terrace	Small Scale	£1,156	£1,093	£2,249	4%
Mid-Terrace	Market Town	£2,370	£1,093	£3,463	6%
Mid-Terrace	Urban Regeneration	£1,496	£1,093	£2,589	5%
Flat	City Infill	£2,310	£211	£2,521	3%
Flat	Market Town	£2,310	£211	£2,521	3%
Flat	Urban Regeneration	£2,052	£211	£2,263	3%

Table G40: 2012 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£0	£0	0%
Detached	Market Town	£0	£0	£0	0%
Detached	Urban Regeneration	£0	£0	£0	0%
End Terrace / Semi-Detached	Small Scale	£0	£0	£0	0%
End Terrace / Semi-Detached	Market Town	£0	£0	£0	0%
End Terrace / Semi-Detached	Urban Regeneration	£0	£0	£0	0%
Mid-Terrace	Small Scale	£0	£0	£0	0%
Mid-Terrace	Market Town	£0	£0	£0	0%
Mid-Terrace	Urban Regeneration	£0	£0	£0	0%
Flat	City Infill	£0	£0	£0	0%



Flat	Market Town	£0	£0	£0	0%
Flat	Urban Regeneration	£0	£0	£0	0%

Table G41: 2013 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,318	£1,564	£11,883	15%
Detached	Market Town	£6,486	£1,564	£8,050	10%
Detached	Urban Regeneration	£5,384	£1,564	£6,949	9%
End Terrace / Semi-Detached	Small Scale	£6,701	£1,704	£8,405	15%
End Terrace / Semi-Detached	Market Town	£4,677	£1,704	£6,380	11%
End Terrace / Semi-Detached	Urban Regeneration	£3,882	£1,704	£5,585	10%
Mid-Terrace	Small Scale	£6,153	£1,704	£7,857	14%
Mid-Terrace	Market Town	£4,067	£1,704	£5,771	10%
Mid-Terrace	Urban Regeneration	£3,376	£1,704	£5,080	9%
Flat	City Infill	£6,340	£613	£6,953	9%
Flat	Market Town	£4,414	£613	£5,028	6%
Flat	Urban Regeneration	£3,131	£613	£3,744	5%

Table G42: 2013 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,318	£0	£10,318	13%
Detached	Market Town	£6,486	£0	£6,486	8%
Detached	Urban Regeneration	£5,384	£0	£5,384	7%
End Terrace / Semi-Detached	Small Scale	£6,701	£0	£6,701	12%
End Terrace / Semi-Detached	Market Town	£4,677	£0	£4,677	8%
End Terrace / Semi-Detached	Urban Regeneration	£3,882	£0	£3,882	7%
Mid-Terrace	Small Scale	£6,153	£0	£6,153	11%

Mid-Terrace	Market Town	£4,067	£0	£4,067	7%
Mid-Terrace	Urban Regeneration	£3,376	£0	£3,376	6%
Flat	City Infill	£6,340	£0	£6,340	8%
Flat	Market Town	£4,414	£0	£4,414	5%
Flat	Urban Regeneration	£3,131	£0	£3,131	4%

Table G43: 2014 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,089	£1,527	£11,617	14%
Detached	Market Town	£6,340	£1,527	£7,868	10%
Detached	Urban Regeneration	£5,263	£1,527	£6,791	8%
End Terrace / Semi-Detached	Small Scale	£6,553	£1,662	£8,215	15%
End Terrace / Semi-Detached	Market Town	£4,572	£1,662	£6,234	11%
End Terrace / Semi-Detached	Urban Regeneration	£3,795	£1,662	£5,456	10%
Mid-Terrace	Small Scale	£6,017	£1,662	£7,679	14%
Mid-Terrace	Market Town	£3,976	£1,662	£5,638	10%
Mid-Terrace	Urban Regeneration	£3,301	£1,662	£4,962	9%
Flat	City Infill	£6,200	£592	£6,792	8%
Flat	Market Town	£4,316	£592	£4,908	6%
Flat	Urban Regeneration	£3,061	£592	£3,653	5%

Table G44: 2014 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,089	£0	£10,089	13%
Detached	Market Town	£6,340	£0	£6,340	8%
Detached	Urban Regeneration	£5,263	£0	£5,263	7%
End Terrace / Semi-Detached	Small Scale	£6,553	£0	£6,553	12%



End Terrace / Semi-Detached	Market Town	£4,572	£0	£4,572	8%
End Terrace / Semi-Detached	Urban Regeneration	£3,795	£0	£3,795	7%
Mid-Terrace	Small Scale	£6,017	£0	£6,017	11%
Mid-Terrace	Market Town	£3,976	£0	£3,976	7%
Mid-Terrace	Urban Regeneration	£3,301	£0	£3,301	6%
Flat	City Infill	£6,200	£0	£6,200	8%
Flat	Market Town	£4,316	£0	£4,316	5%
Flat	Urban Regeneration	£3,061	£0	£3,061	4%

Table G45: 2015 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£9,751	£3,743	£13,494	17%
Detached	Market Town	£6,096	£3,743	£9,840	12%
Detached	Urban Regeneration	£5,061	£3,743	£8,804	11%
End Terrace / Semi-Detached	Small Scale	£6,346	£4,097	£10,444	18%
End Terrace / Semi-Detached	Market Town	£4,396	£4,097	£8,493	15%
End Terrace / Semi-Detached	Urban Regeneration	£3,648	£4,097	£7,746	14%
Mid-Terrace	Small Scale	£5,830	£4,097	£9,927	18%
Mid-Terrace	Market Town	£3,823	£4,097	£7,920	14%
Mid-Terrace	Urban Regeneration	£3,173	£4,097	£7,271	13%
Flat	City Infill	£6,009	£1,521	£7,530	9%
Flat	Market Town	£4,167	£1,521	£5,688	7%
Flat	Urban Regeneration	£2,943	£1,521	£4,463	6%

Table G46: 2015 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£0	£0	0%
Detached	Market Town	£0	£0	£0	0%
Detached	Urban Regeneration	£0	£0	£0	0%
End Terrace / Semi-Detached	Small Scale	£0	£0	£0	0%
End Terrace / Semi-Detached	Market Town	£0	£0	£0	0%
End Terrace / Semi-Detached	Urban Regeneration	£0	£0	£0	0%
Mid-Terrace	Small Scale	£0	£0	£0	0%
Mid-Terrace	Market Town	£0	£0	£0	0%
Mid-Terrace	Urban Regeneration	£0	£0	£0	0%
Flat	City Infill	£0	£0	£0	0%
Flat	Market Town	£0	£0	£0	0%
Flat	Urban Regeneration	£0	£0	£0	0%

Table G47: 2016 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£3,418	£3,418	4%
Detached	Market Town	£0	£3,418	£3,418	4%
Detached	Urban Regeneration	£0	£3,418	£3,418	4%
End Terrace / Semi-Detached	Small Scale	£0	£4,263	£4,263	8%
End Terrace / Semi-Detached	Market Town	£0	£4,263	£4,263	8%
End Terrace / Semi-Detached	Urban Regeneration	£0	£4,263	£4,263	8%
Mid-Terrace	Small Scale	£0	£4,263	£4,263	8%
Mid-Terrace	Market Town	£0	£4,263	£4,263	8%
Mid-Terrace	Urban Regeneration	£0	£4,263	£4,263	8%
Flat	City Infill	£0	£1,475	£1,475	2%



Flat	Market Town	£0	£1,475	£1,475	2%
Flat	Urban Regeneration	£0	£1,475	£1,475	2%

Table G48: 2016 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£0	£0	0%
Detached	Market Town	£0	£0	£0	0%
Detached	Urban Regeneration	£0	£0	£0	0%
End Terrace / Semi-Detached	Small Scale	£0	£0	£0	0%
End Terrace / Semi-Detached	Market Town	£0	£0	£0	0%
End Terrace / Semi-Detached	Urban Regeneration	£0	£0	£0	0%
Mid-Terrace	Small Scale	£0	£0	£0	0%
Mid-Terrace	Market Town	£0	£0	£0	0%
Mid-Terrace	Urban Regeneration	£0	£0	£0	0%
Flat	City Infill	£0	£0	£0	0%
Flat	Market Town	£0	£0	£0	0%
Flat	Urban Regeneration	£0	£0	£0	0%

Please note that all costings information within tables G37 to G48 is based on an assumed low ecological site value and no financial requirement to mitigate flood risk.

These results have been summarised in tables G49 and G50. G49 refers to the increased cost of dwellings that are privately funded, while G50 refers to the increased cost of dwellings that are publicly funded.

Table G49: Additional development costs summary of privately funded dwellings.

Dwelling type	Development scenario	2011	2012	2013	2014	2015	2016
Detached	Small Scale	£7,505	£7,407	£11,883	£11,617	£13,494	£3,418
Detached	Market Town	£6,501	£6,414	£8,050	£7,868	£9,840	£3,418
Detached	Urban Regeneration	£3,366	£3,312	£6,949	£6,791	£8,804	£3,418

End Terrace / Semi-Detached	Small Scale	£3,016	£2,959	£8,405	£8,215	£10,444	£4,263
End Terrace / Semi-Detached	Market Town	£4,417	£4,345	£6,380	£6,234	£8,493	£4,263
End Terrace / Semi-Detached	Urban Regeneration	£2,964	£2,908	£5,585	£5,456	£7,746	£4,263
Mid-Terrace	Small Scale	£2,299	£2,249	£7,857	£7,679	£9,927	£4,263
Mid-Terrace	Market Town	£3,526	£3,463	£5,771	£5,638	£7,920	£4,263
Mid-Terrace	Urban Regeneration	£2,643	£2,589	£5,080	£4,962	£7,271	£4,263
Flat	City Infill	£2,567	£2,521	£6,953	£6,792	£7,530	£1,475
Flat	Market Town	£2,567	£2,521	£5,028	£4,908	£5,688	£1,475
Flat	Urban Regeneration	£2,306	£2,263	£3,744	£3,653	£4,463	£1,475
	Average	£3,640	£3,579	£6,807	£6,651	£8,468	£3,355

Table G50: Additional development costs summary of publicly funded dwellings.

Dwelling type	Development scenario	2011	2012	2013	2014	2015	2016
Detached	Small Scale	£6,718	£0	£10,318	£10,089	£0	£0
Detached	Market Town	£5,714	£0	£6,486	£6,340	£0	£0
Detached	Urban Regeneration	£2,580	£0	£5,384	£5,263	£0	£0
End Terrace / Semi-Detached	Small Scale	£1,885	£0	£6,701	£6,553	£0	£0
End Terrace / Semi-Detached	Market Town	£3,286	£0	£4,677	£4,572	£0	£0
End Terrace / Semi-Detached	Urban Regeneration	£1,834	£0	£3,882	£3,795	£0	£0
Mid-Terrace	Small Scale	£1,168	£0	£6,153	£6,017	£0	£0
Mid-Terrace	Market Town	£2,395	£0	£4,067	£3,976	£0	£0
Mid-Terrace	Urban Regeneration	£1,512	£0	£3,376	£3,301	£0	£0
Flat	City Infill	£2,335	£0	£6,340	£6,200	£0	£0
Flat	Market Town	£2,335	£0	£4,414	£4,316	£0	£0
Flat	Urban Regeneration	£2,074	£0	£3,131	£3,061	£0	£0
	Average	£2,820	£0	£5,411	£5,290	£0	£0



Summary

As can be seen in tables G49 and G50 above, the average cost to developers of both private and publicly funded development increases as development moves towards zero carbon.

The step changes that can be seen in the additional costs for privately funded developments mirror the upgrading of requirements. The near doubling between 2012 and 2013 is a result of the overall compliance requirement moving from Code Level 3 to Code Level 4 and the energy compliance requirement moving from a 44% to 100% reduction in regulated emissions. The next step in 2015 is a result of the overall compliance moving from Code Level 4 to Code Level 5 which includes the additional costs for compliance with the most stringent water standards as necessary at that level of the Code. Please note: none of these figures include a requirement for compliance with Code 6 emissions.

While additional costs from privately funded dwellings are over 10% in 2015, potentially placing a developer under undue burden, it is important to highlight that there is no official definition of undue burden³¹ and the consultation on the definition of zero carbon. The issue of cost has been raised within the consultation, with the government looking at setting a figure of £ per tonne of carbon as part of 'allowable solutions'.

Publicly funded developments see a relatively large increase in costs with the shift to Code Level 5 ENE1 requirements in 2013 and 2014. It is interesting to note that for publicly funded developments additional costs only apply in three out of the six years analysed. Within the remaining three years, the policy's requirements are in line with the criteria set by the Homes and Communities Agency (HCA).

Taking into account the average cost of construction (as per the Q4 2007 pricing levels, averaged across the four dwelling types), this results in the following percentage cost increase for developers.

Privately funded developments:

2011 – 5.32%
2012 – 5.32%
2013 – 9.94%
2014 – 9.71%
2015 – 12.37%
2016 – 4.90%

Publicly funded developments:

2011 – 4.12%
2012 – 0%

³¹ Please note that there is currently no recognised definition of undue burden in national policy or guidance. Anecdotal evidence suggests that an increase in costs of over 10% is undue. PPS 22 simply requires that policies “

2013 – 7.90%
 2014 – 7.72%
 2015 – 0%
 2016 – 0%

On average, the additional cost to privately funded development is 7.9% between 2011 and 2016. The average additional cost to publicly funded development over the same period is 3.9%.

A review of these additional costs in comparison to the other revised policy options can be found in section G1.3 below.

G1.2.3 Option 3: Meeting Code Level 3, plus higher energy and water standards

Building on the proposed option within G1.2.2, this section of the report also considers up-rated water efficiency targets.

Within the Code for Sustainable Homes there are three different requirements for water. At Code Levels 1 and 2 it is mandatory to demonstrate compliance with maximum usage figures of 120 litres per person per day. For Levels 3 and 4 water usage is reduced to 105 litres per person per day, and for Levels 5 and 6 water usage is reduced further to 80 litres per person per day.

We have therefore proposed that when Code Level 4 is being sought by policy PCS9 the water requirement be up-rated to Level 5 requirements. In effect this will mean bringing in the highest water standards of the Code for Sustainable Homes in 2013 rather than 2015.

Tables G51 and G52 below show these changes between 2011 and 2016.

Table G51 highlights the step change between Portsmouth City Council’s PCS9 policy in comparison to national policy in terms of the Code for Sustainable Homes.

Table G51: Code Compliance – requirements of Portsmouth City Council and the Housing and Communities Agency (HCA) (formerly the Housing Corporation and English Partnerships).

Year	Change to Code Level			Private BGF to PCS9	Social HCDQS to PCS9
	PCS9	Building a Greener Future (BGF)	Housing Corporation Design Quality Standards (HCDQS)		



2010	~	~	~	~	~
2011	3	None	3	None to 3	~
2012	3	None	4	None to 3	~
2013	4	None	4	None to 4	~
2014	4	None	4	None to 4	~
2015	5	None	6	None to 5	~
2016	6	None	6	None to 6	~

Table G52 demonstrates the step change between Portsmouth City Council's PCS9 policy in comparison to national policy in terms of Carbon compliance.

Table G52: Carbon compliance – requirements of Portsmouth City Council and the Housing and Communities Agency (HCA) (formerly the Housing Corporation and English Partnerships).

Year	% improvement on DER			Private	Social
	PCS9	Building a Greener Future (BGF)	Housing Corporation Design Quality Standards (HCDQS)	BGF to PCS9	HCDQS to PCS9
2010	~	~	~	~	~
2011	44%	25%	25%	25% to 44%	25% to 44%
2012	44%	25%	44%	25% to 44%	~
2013	100%	44%	44%	44% to 100%	44% to 100%
2014	100%	44%	44%	44% to 100%	44% to 100%
2015	100%	44%	Zero CO ₂	44% to 100%	~
2016	Zero CO ₂	Zero CO ₂	Zero CO ₂	~	~

Key to tables G2 and G3 above:

DER Dwelling Emissions Rate (as per Building Regulations ADL1 2006)

PCS9	Portsmouth City Council's Proposed Sustainable Development Policy
BGF	Building A Greener Future 2007 Policy Statement
HCDQS	Housing Corporation Design and Quality Strategy 2007
EP/HC	English Partnerships and the Housing Corporation

An overall summary of the revised additional development costs can be found below.



Table G53: 2011 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£6,718	£787	£7,505	9%
Detached	Market Town	£5,714	£787	£6,501	8%
Detached	Urban Regeneration	£2,580	£787	£3,366	4%
End Terrace / Semi-Detached	Small Scale	£1,885	£1,131	£3,016	5%
End Terrace / Semi-Detached	Market Town	£3,286	£1,131	£4,417	8%
End Terrace / Semi-Detached	Urban Regeneration	£1,834	£1,131	£2,964	5%
Mid-Terrace	Small Scale	£1,168	£1,131	£2,299	4%
Mid-Terrace	Market Town	£2,395	£1,131	£3,526	6%
Mid-Terrace	Urban Regeneration	£1,512	£1,131	£2,643	5%
Flat	City Infill	£2,335	£232	£2,567	3%
Flat	Market Town	£2,335	£232	£2,567	3%
Flat	Urban Regeneration	£2,074	£232	£2,306	3%

Table G54: 2011 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£6,718	£0	£6,718	8%
Detached	Market Town	£5,714	£0	£5,714	7%
Detached	Urban Regeneration	£2,580	£0	£2,580	3%
End Terrace / Semi-Detached	Small Scale	£1,885	£0	£1,885	3%
End Terrace / Semi-Detached	Market Town	£3,286	£0	£3,286	6%
End Terrace / Semi-Detached	Urban Regeneration	£1,834	£0	£1,834	3%
Mid-Terrace	Small Scale	£1,168	£0	£1,168	2%
Mid-Terrace	Market Town	£2,395	£0	£2,395	4%
Mid-Terrace	Urban Regeneration	£1,512	£0	£1,512	3%
Flat	City Infill	£2,335	£0	£2,335	3%

Flat	Market Town	£2,335	£0	£2,335	3%
Flat	Urban Regeneration	£2,074	£0	£2,074	3%

Table G55: 2012 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£6,648	£759	£7,407	9%
Detached	Market Town	£5,654	£759	£6,414	8%
Detached	Urban Regeneration	£2,553	£759	£3,312	4%
End Terrace / Semi-Detached	Small Scale	£1,866	£1,093	£2,959	5%
End Terrace / Semi-Detached	Market Town	£3,252	£1,093	£4,345	8%
End Terrace / Semi-Detached	Urban Regeneration	£1,815	£1,093	£2,908	5%
Mid-Terrace	Small Scale	£1,156	£1,093	£2,249	4%
Mid-Terrace	Market Town	£2,370	£1,093	£3,463	6%
Mid-Terrace	Urban Regeneration	£1,496	£1,093	£2,589	5%
Flat	City Infill	£2,310	£211	£2,521	3%
Flat	Market Town	£2,310	£211	£2,521	3%
Flat	Urban Regeneration	£2,052	£211	£2,263	3%

Table G56: 2012 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£0	£0	0%
Detached	Market Town	£0	£0	£0	0%
Detached	Urban Regeneration	£0	£0	£0	0%
End Terrace / Semi-Detached	Small Scale	£0	£0	£0	0%
End Terrace / Semi-Detached	Market Town	£0	£0	£0	0%
End Terrace / Semi-Detached	Urban Regeneration	£0	£0	£0	0%
Mid-Terrace	Small Scale	£0	£0	£0	0%



Mid-Terrace	Market Town	£0	£0	£0	0%
Mid-Terrace	Urban Regeneration	£0	£0	£0	0%
Flat	City Infill	£0	£0	£0	0%
Flat	Market Town	£0	£0	£0	0%
Flat	Urban Regeneration	£0	£0	£0	0%

Table G57: 2013 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,318	£3,660	£13,979	17%
Detached	Market Town	£6,486	£3,660	£10,146	13%
Detached	Urban Regeneration	£5,384	£3,660	£9,045	11%
End Terrace / Semi-Detached	Small Scale	£6,701	£3,800	£10,501	19%
End Terrace / Semi-Detached	Market Town	£4,677	£3,800	£8,476	15%
End Terrace / Semi-Detached	Urban Regeneration	£3,882	£3,800	£7,681	14%
Mid-Terrace	Small Scale	£6,153	£3,800	£9,953	18%
Mid-Terrace	Market Town	£4,067	£3,800	£7,867	14%
Mid-Terrace	Urban Regeneration	£3,376	£3,800	£7,176	13%
Flat	City Infill	£6,340	£1,180	£7,520	9%
Flat	Market Town	£4,414	£1,180	£5,595	7%
Flat	Urban Regeneration	£3,131	£1,180	£4,311	5%

Table G58: 2013 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,318	£2,096	£12,414	15%
Detached	Market Town	£6,486	£2,096	£8,582	11%
Detached	Urban Regeneration	£5,384	£2,096	£7,480	9%
End Terrace / Semi-Detached	Small Scale	£6,701	£2,096	£8,797	16%

End Terrace / Semi-Detached	Market Town	£4,677	£2,096	£6,773	12%
End Terrace / Semi-Detached	Urban Regeneration	£3,882	£2,096	£5,978	11%
Mid-Terrace	Small Scale	£6,153	£2,096	£8,249	15%
Mid-Terrace	Market Town	£4,067	£2,096	£6,163	11%
Mid-Terrace	Urban Regeneration	£3,376	£2,096	£5,472	10%
Flat	City Infill	£6,340	£567	£6,907	9%
Flat	Market Town	£4,414	£567	£4,981	6%
Flat	Urban Regeneration	£3,131	£567	£3,698	5%

Table G59: 2014 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,089	£3,548	£13,638	17%
Detached	Market Town	£6,340	£3,548	£9,889	12%
Detached	Urban Regeneration	£5,263	£3,548	£8,812	11%
End Terrace / Semi-Detached	Small Scale	£6,553	£3,683	£10,236	18%
End Terrace / Semi-Detached	Market Town	£4,572	£3,683	£8,255	15%
End Terrace / Semi-Detached	Urban Regeneration	£3,795	£3,683	£7,477	13%
Mid-Terrace	Small Scale	£6,017	£3,683	£9,700	17%
Mid-Terrace	Market Town	£3,976	£3,683	£7,659	14%
Mid-Terrace	Urban Regeneration	£3,301	£3,683	£6,983	12%
Flat	City Infill	£6,200	£1,139	£7,339	9%
Flat	Market Town	£4,316	£1,139	£5,455	7%
Flat	Urban Regeneration	£3,061	£1,139	£4,200	5%



Table G60: 2014 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£10,089	£2,021	£12,110	15%
Detached	Market Town	£6,340	£2,021	£8,361	10%
Detached	Urban Regeneration	£5,263	£2,021	£7,284	9%
End Terrace / Semi-Detached	Small Scale	£6,553	£2,021	£8,574	15%
End Terrace / Semi-Detached	Market Town	£4,572	£2,021	£6,593	12%
End Terrace / Semi-Detached	Urban Regeneration	£3,795	£2,021	£5,816	10%
Mid-Terrace	Small Scale	£6,017	£2,021	£8,038	14%
Mid-Terrace	Market Town	£3,976	£2,021	£5,997	11%
Mid-Terrace	Urban Regeneration	£3,301	£2,021	£5,322	9%
Flat	City Infill	£6,200	£547	£6,747	8%
Flat	Market Town	£4,316	£547	£4,863	6%
Flat	Urban Regeneration	£3,061	£547	£3,608	4%

Table G61: 2015 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£9,751	£3,743	£13,494	17%
Detached	Market Town	£6,096	£3,743	£9,840	12%
Detached	Urban Regeneration	£5,061	£3,743	£8,804	11%
End Terrace / Semi-Detached	Small Scale	£6,346	£4,097	£10,444	18%
End Terrace / Semi-Detached	Market Town	£4,396	£4,097	£8,493	15%
End Terrace / Semi-Detached	Urban Regeneration	£3,648	£4,097	£7,746	14%
Mid-Terrace	Small Scale	£5,830	£4,097	£9,927	18%
Mid-Terrace	Market Town	£3,823	£4,097	£7,920	14%
Mid-Terrace	Urban Regeneration	£3,173	£4,097	£7,271	13%
Flat	City Infill	£6,009	£1,521	£7,530	9%

Flat	Market Town	£4,167	£1,521	£5,688	7%
Flat	Urban Regeneration	£2,943	£1,521	£4,463	6%

Table G62: 2015 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£0	£0	0%
Detached	Market Town	£0	£0	£0	0%
Detached	Urban Regeneration	£0	£0	£0	0%
End Terrace / Semi-Detached	Small Scale	£0	£0	£0	0%
End Terrace / Semi-Detached	Market Town	£0	£0	£0	0%
End Terrace / Semi-Detached	Urban Regeneration	£0	£0	£0	0%
Mid-Terrace	Small Scale	£0	£0	£0	0%
Mid-Terrace	Market Town	£0	£0	£0	0%
Mid-Terrace	Urban Regeneration	£0	£0	£0	0%
Flat	City Infill	£0	£0	£0	0%
Flat	Market Town	£0	£0	£0	0%
Flat	Urban Regeneration	£0	£0	£0	0%

Table G63: 2016 - Additional development costs in privately funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£3,418	£3,418	4%
Detached	Market Town	£0	£3,418	£3,418	4%
Detached	Urban Regeneration	£0	£3,418	£3,418	4%
End Terrace / Semi-Detached	Small Scale	£0	£4,263	£4,263	8%
End Terrace / Semi-Detached	Market Town	£0	£4,263	£4,263	8%
End Terrace / Semi-Detached	Urban Regeneration	£0	£4,263	£4,263	8%
Mid-Terrace	Small Scale	£0	£4,263	£4,263	8%



Mid-Terrace	Market Town	£0	£4,263	£4,263	8%
Mid-Terrace	Urban Regeneration	£0	£4,263	£4,263	8%
Flat	City Infill	£0	£1,475	£1,475	2%
Flat	Market Town	£0	£1,475	£1,475	2%
Flat	Urban Regeneration	£0	£1,475	£1,475	2%

Table G64: 2016 - Additional development costs in publicly funded dwellings.

Dwelling type	Development scenario	Carbon compliance (£)	Code compliance (£)	Combined (£)	% increase in costs
Detached	Small Scale	£0	£0	£0	0%
Detached	Market Town	£0	£0	£0	0%
Detached	Urban Regeneration	£0	£0	£0	0%
End Terrace / Semi-Detached	Small Scale	£0	£0	£0	0%
End Terrace / Semi-Detached	Market Town	£0	£0	£0	0%
End Terrace / Semi-Detached	Urban Regeneration	£0	£0	£0	0%
Mid-Terrace	Small Scale	£0	£0	£0	0%
Mid-Terrace	Market Town	£0	£0	£0	0%
Mid-Terrace	Urban Regeneration	£0	£0	£0	0%
Flat	City Infill	£0	£0	£0	0%
Flat	Market Town	£0	£0	£0	0%
Flat	Urban Regeneration	£0	£0	£0	0%

Please note that all costings information within tables G53 to G64 is based on an assumed low ecological site value and no financial requirement to mitigate flood risk.

These results have been summarised in tables G65 and G66. G65 refers to the increased cost of dwellings that are privately funded, while G66 refers to the increased cost of dwellings that are publicly funded.

Table G65: Additional development costs summary of privately funded dwellings.

Dwelling type	Development scenario	2011	2012	2013	2014	2015	2016
Detached	Small Scale	£7,505	£7,407	£13,979	£13,638	£13,494	£3,418
Detached	Market Town	£6,501	£6,414	£10,146	£9,889	£9,840	£3,418
Detached	Urban Regeneration	£3,366	£3,312	£9,045	£8,812	£8,804	£3,418
End Terrace / Semi-Detached	Small Scale	£3,016	£2,959	£10,501	£10,236	£10,444	£4,263
End Terrace / Semi-Detached	Market Town	£4,417	£4,345	£8,476	£8,255	£8,493	£4,263
End Terrace / Semi-Detached	Urban Regeneration	£2,964	£2,908	£7,681	£7,477	£7,746	£4,263
Mid-Terrace	Small Scale	£2,299	£2,249	£9,953	£9,700	£9,927	£4,263
Mid-Terrace	Market Town	£3,526	£3,463	£7,867	£7,659	£7,920	£4,263
Mid-Terrace	Urban Regeneration	£2,643	£2,589	£7,176	£6,983	£7,271	£4,263
Flat	City Infill	£2,567	£2,521	£7,520	£7,339	£7,530	£1,475
Flat	Market Town	£2,567	£2,521	£5,595	£5,455	£5,688	£1,475
Flat	Urban Regeneration	£2,306	£2,263	£4,311	£4,200	£4,463	£1,475
	Average	£3,640	£3,579	£8,521	£8,304	£8,468	£3,355

Table G66: Additional development costs summary of publicly funded dwellings.

Dwelling type	Development scenario	2011	2012	2013	2014	2015	2016
Detached	Small Scale	£6,718	£0	£12,414	£12,110	£0	£0
Detached	Market Town	£5,714	£0	£8,582	£8,361	£0	£0
Detached	Urban Regeneration	£2,580	£0	£7,480	£7,284	£0	£0
End Terrace / Semi-Detached	Small Scale	£1,885	£0	£8,797	£8,574	£0	£0
End Terrace / Semi-Detached	Market Town	£3,286	£0	£6,773	£6,593	£0	£0
End Terrace / Semi-Detached	Urban Regeneration	£1,834	£0	£5,978	£5,816	£0	£0
Mid-Terrace	Small Scale	£1,168	£0	£8,249	£8,038	£0	£0
Mid-Terrace	Market Town	£2,395	£0	£6,163	£5,997	£0	£0
Mid-Terrace	Urban Regeneration	£1,512	£0	£5,472	£5,322	£0	£0
Flat	City Infill	£2,335	£0	£6,907	£6,747	£0	£0



Flat	Market Town	£2,335	£0	£4,981	£4,863	£0	£0
Flat	Urban Regeneration	£2,074	£0	£3,698	£3,608	£0	£0
	Average	£2,820	£0	£7,125	£6,943	£0	£0

Summary

As outlined above, we have proposed that when Code Level 4 is being sought the water requirement is up-rated to the water requirements within Code Level 5. In effect this will mean bringing in the highest water standards of the Code for Sustainable Homes in 2013 rather than 2015. The isolated additional development cost for up-rating the water requirements from those within Code Levels 3 and 4 to Code Level 5 and 6 requirements in these two years is outlined within table G67.

Table G67: additional costs of higher water standards.

Dwelling type	2013	2014
House	£2,096	£2,021
Flat	£567	£547

As can be seen in tables G65 and G66 above, the average cost to developers of both private and publicly funded development increases and decreases as development moves towards zero carbon.

The step change that can be seen in the additional costs for privately funded developments mirrors the upgrading of requirements. The near doubling between 2012 and 2013 is as a result of the overall compliance requirement moving from Code Level 3 to Code Level 4 and the energy compliance requirement moving from a 44% to 100% reduction in regulated emissions. The next step in 2015 is as a result of the overall compliance moving from Code Level 4 to Code Level 5 which includes the additional costs for compliance with the most stringent water standards as necessary at that level of the Code. Please note: none of these figures includes a requirement for compliance with Code Level 6 emissions.

Publicly funded developments also see a relatively large increase in costs with the shift to Code Level 5 ENE1 requirements in 2013 and 2014. It is interesting to note that for publicly funded developments additional costs only apply in three out of the six years analysed. Within the remaining three years, the policy's requirements are in line with the criteria set by the Homes and Communities Agency (HCA).

While additional costs from privately funded dwellings are over 10% in 2015, potentially placing a developer under undue burden, it is important to highlight that there is no official definition of undue burden*³² and the consultation on the definition of zero carbon. The

³² Please note that there is currently no recognised definition of undue burden in national policy or guidance. Anecdotal evidence suggests that an increase in costs of over 10% is undue. PPS 22 simply requires that policies "

issue of cost has been raised within the consultation, with the government looking at setting a figure of £ per tonne of carbon as part of 'allowable solutions'.

Taking into account the average cost of construction (as per the Q4 2007 pricing levels, averaged across the four dwelling types), this results in the following percentage cost increases for developers:

Privately funded developments:

2011 – 5.32%
2012 – 5.23%
2013 – 12.44%
2014 – 12.13%
2015 – 12.37%
2016 – 4.90%

Publicly funded developments:

2011 – 4.12%
2012 – 0%
2013 – 10.40%
2014 – 10.14%
2015 – 0%
2016 – 0%

On average, the additional cost to privately funded development is 8.7% between 2011 and 2016. The average additional cost to publicly funded development over the same period is 4.11%.

A review of these additional costs in comparison to the other revised policy options can be found in section G1.3 below.

G1.3 Section summary

Impetus and Greenlight Construction met with Portsmouth City Council staff on 31 March 2008. During this meeting there was a discussion about the cost implications to developers as per sections 5.1. We had concerns that the additional costs to developers, particularly those increases above 10%, could be considered an undue financial burden³³ on developers. It should also be noted that for

³³ Please note that there is currently no recognised definition of undue burden in national policy or guidance. Anecdotal evidence suggests that an increase in costs of over 10% is undue. PPS 22 simply requires that policies " ". The issue of cost is currently being looked at as part of the consultation on the definition of zero carbon, however this will only relate to the Code for Sustainable Homes, and not developments incorporating



major developments (classified as 10 or more dwellings) an additional financial burden from the policy's renewable energy requirement will add to these figures.

Portsmouth City Council staff requested that different policy options be assessed to ensure that undue burden was not placed on developers. This included a reduction in the requirements of proposed Policy PCS9, if the current policy was found to place an undue burden on developers. It was also pointed out that, due to delays in the development of the Council's Core Strategy, the date of implementation for the policy would no longer be 2010, but 2011.

We initially started by analysing the cost implications of deferring the policy implementation until 2011. Even with the deferred implementation of policy PCS9, the additional cost to developers could still be considered undue. Therefore we analysed several options open to the Council to ensure that the sustainability aims of policy PCS9 are met. These include:

- Option 1: Reduce the overall Code for Sustainable Homes rating on new developments from Level 4 to Level 3;
- Option 2: Reduce the overall Code for Sustainable Homes rating on new developments from Level 4 to Level 3, but still require higher energy standards associated with higher Levels of the Code; and
- Option 3: Reduce the overall Code for Sustainable Homes rating on new developments from Level 4 to Level 3, but still require higher energy and water standards associated with higher Levels of the Code.

The costs associated with these different scenarios have been highlighted in table G68 below.

Within all the scenarios, the average cost to developers of both private and publicly funded development increases and decreases as development moves towards zero carbon.

Privately funded developments will see a significant increase in costs with the shift to Code Level 5 in 2015. This is due to the large increase in carbon reduction (a further 127% reduction in regulated emissions) required.

Publicly funded developments also see increases in costs, although some of the policy options either result in no additional cost or increased costs in certain years. This is because developers are following the Homes and Communities Agency's (HCA) mandatory timetable. This means that in 2015 and 2016, policy PCS9 would not increase the financial burden on developers since the standards would be mandatory for such developments.

Taking into account the average cost of construction (as per the Q4 2007 pricing levels, averaged across the four dwelling types), this results in the following percentage cost increase for developers, as shown in table G68.

Table G68: Additional cost to developers of the different policy options.

BREEAM standards and/or renewable energy requirements. The government is looking at setting a figure of £ per tonne of carbon within the Code as part of 'allowable solutions'.

	2010	2011	2012	2013	2014	2015	2016	Overall % increase
Original policy PCS9: SUSTAINABLE DEVELOPMENT								
Private								
Additional cost (£)	£4,363	£4,287	£12,054	£9,048	£8,811	£17,435	£3,355	12.38
Additional cost (%)	6.37	6.26	17.60	13.21	12.87	25.46	4.90	
Public								
Additional cost (£)	£3,502	£3,458	£7,832	£7,652	£7,450	£0	£0	6.24
Additional cost (%)	5.11	5.05	11.44	11.17	10.88	0.00	0.00	
Deferred implementation of policy PCS9: SUSTAINABLE DEVELOPMENT								
Private								
Additional cost (£)	~	£4,287	£12,054	£9,048	£8,811	£17,435	£3,355	13.38
Additional cost (%)	~	6.26	17.60	13.21	12.87	25.46	4.90	
Public								
Additional cost (£)	~	£3,458	£7,832	£7,652	£7,450	£0	£0	6.42
Additional cost (%)	~	5.05	11.44	11.17	10.88	0.00	0.00	
Option 1: Meeting Code Level 3								
Private								
Additional cost (£)	~	£820	£789	£1,396	£1,361	£8468	£3,355	4.01
Additional cost (%)	~	1.20	1.15	2.04	1.99	12.79	4.90	
Public								
Additional cost (£)	~	£0	£0	£0	£0	£0	£0	0.00
Additional cost (%)	~	0.00	0.00	0.00	0.00	0.00	0.00	



Option 2: Meeting Code Level 3, plus higher energy standards associated with higher Code levels								
Private								
Additional cost (£)	~	£3,640	£3,579	£6,807	£6,651	£8,468	£3,355	7.91
Additional cost (%)	~	5.32	5.23	9.94	9.71	12.37	4.90	
Public								
Additional cost (£)	~	£2,820	£0	£5,411	£5,290	£0	£0	3.29
Additional cost (%)	~	4.12	0.00	7.90	7.72	0.00	0.00	
Option 3: Meeting Code Level 3, plus energy and water standards associated with higher Code levels								
Private								
Additional cost (£)	~							8.73
Additional cost (%)	~	5.32	5.23	12.44	12.13	12.37	4.90	
Public								
Additional cost (£)	~	£2,820	£0	£7,125	£6,943	£0	£0	4.11
Additional cost (%)	~	4.12	0.00	10.40	10.14	0.00	0.00	

In conclusion, Impetus and Greenlight Construction believe that:

The original proposed policy, whilst admirable, is too robust and will put an undue burden on developers;

The deference of the introduction of the policy does not remove this undue burden on developers;

Options 1, 2 and 3 would require that the Lifetime Homes standard would not become mandatory for all dwellings until 2013, which would limit the financial burden on developers until this point. The original PCS9 policy requirements would have meant that this standard would have been mandatory from 2010;

The lowering of the Code for Sustainable Homes standards (option 1) does dramatically reduce the financial burden to developers; however the policy is too weak. There are a couple of points in the lifetime of the policy time where it will be less robust than the Homes and Communities Agency requirements. This does not fulfil the aim of policy PCS9 of being at the 'forefront' of sustainable development; and

Either of the final two options (2 and 3), which would require developers to meet higher energy and water standards, would seem to be the most sensible way forward. While the additional financial burden on developers is not as high as the financial impact of the original proposed policy, raising energy and water standards fulfils the aims of policy PCS9.

APPENDIX H - SITE ASSESSMENT COSTINGS

H1.1 Site A

Table H1: Site information.

Proposed number of units	10
Assumed development scenario	Small scale
Year of cost analysis	2011/2012
Assumed development mix	
Private	
Detached	0
End Terrace / Semi-Detached	2
Mid-Terrace	2
Flat	2
Social	
Detached	0
End Terrace / Semi-Detached	0
Mid-Terrace	2
Flat	2

The additional development costs of the policy options tested in this report can be found in tables H2, H3 and H4 below.

Table H2: Additional development costs – deferred proposed policy PCS9.

Dwelling Type	Number	Per unit (£)	Totals (£)	Overall average (£)
Private - End Terrace / Semi-Detached	2	£8,464	£16,927	
Private - Mid Terrace	2	£7,473	£14,946	
Private – Flat (city infill figures used)	2	£6,724	£13,448	
Social - Mid Terrace	2	£5,453	£10,905	
Social – Flat (city infill figures used)	2	£5,131	£10,262	
			£66,488	£6,649



Table H3: Additional development costs – policy option 1.

Dwelling Type	Number	Per unit (£)	Totals (£)	Overall average (£)
Private - End Terrace / Semi-Detached	2	£1,112	£2,224	
Private - Mid Terrace	2	£1,112	£2,224	
Private – Flat (city infill figures used)	2	£222	£443	
Social - Mid Terrace	2	£0	£0	
Social – Flat (city infill figures used)	2	£0	£0	
			£4,891	£489

Table H4: Additional development costs – policy option 2.

Dwelling Type	Number	Per unit (£)	Totals (£)	Overall average (£)
Private - End Terrace / Semi-Detached	2	£2,988	£5,975	
Private - Mid Terrace	2	£2,274	£4,548	
Private – Flat (city infill figures used)	2	£2,544	£5,088	
Social - Mid Terrace	2	£584	£1,168	
Social – Flat (city infill figures used)	2	£1,168	£2,335	
			£19,114	£1,911

H1.2 Site B

Details of site B can be found in table H5 below.

Table H5: Site information.

Proposed number of units	5
Assumed development scenario	City infill
Year of cost analysis	2011/2012
Assumed development mix	
Private	
Detached	0
End Terrace / Semi-Detached	0
Mid-Terrace	0
Flat	0
Social	
Detached	1
End Terrace / Semi-Detached	0

