Communities and Local Government

Impact Assessment

Planning Policy Statement (PPS): Eco-towns – Consultation

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November 2008
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Summary: Intervention & Options

Department /Agency:	**Title:** **Impact Assessment of Planning Policy Statement (PPS): Eco-towns – Consultation Document**	
Stage: Consultation	**Version:** 1	**Date:** 1 October 2008
Related Publications: Planning Policy Statement: Eco-towns – Consultation		

Available to view or download at:
http://www.communities.gov.uk

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What is the problem under consideration? Why is government intervention necessary?

The policy responds to two major challenges:
(1) Housing shortage; and
(2) the threat of climate change.

Eco-towns will contribute to the Government's target to deliver an additional 2m homes by 2016 and 3m by 2020, helping to meet housing need and tackle long term affordability. Eco-towns will be built to higher sustainability standards, in order to help tackle climate change. There is an overwhelming body of scientific evidence highlighting the serious and urgent nature of climate change, largely due to emissions of greenhouse gases as a result of human activities such as the combustion of fossil fuels and changing patterns of land use. Further information is set out in the evidence section.

What are the policy objectives and the intended effects?

The policy statement is intended to:

a. support the delivery of additional housing in new settlements, to contribute to the Government's ambition for 3m additional houses in England by 2020; and

b. to deliver highly sustainable developments, which are zero carbon and will act as exemplars for development more widely

The PPS sets out what makes a new settlement an eco-town and the planning process necessary for them to be delivered efficiently and effectively.

The PPS sets out a range of minimum standards, which will be used to define an eco-town. The standards are consistent with Government's wider planning policies, but set more challenging and stretching standards than would normally be required for a development.

Further information is set out in the evidence section.

What policy options have been considered? Please justify any preferred option.

There are many potential policy responses to the twin challenges of housing shortage and climate change. Since 1997 the Government has implemented a range of measures to support increased housing supply, including a new planning policy statement for housing (PPS 3). The UK Government has already implemented a variety of actions on climate change as outlined in the UK Climate Change Programme. Many of these measures have been undertaken in partnership with the European Union, whilst others are UK-focused initiatives. The eco-towns programme, which the PPS supports, adds to this package of measures.

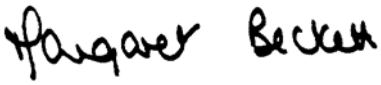
When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects?

This IA will be updated and published alongside the final PPS following consultation (expected early 2009). A review of the actual impacts is expected in three years time.

Ministerial Sign-off For consultation stage Impact Assessments:

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister:



Date: 3 November 2008

Summary: Analysis & Evidence

Policy Option: **Description: Planning Policy Statement: Eco-towns (draft for consultation)**

COSTS

ANNUAL COSTS		Description and scale of **key monetised costs** by 'main affected groups'
One-off (Transition)	**Yrs**	The evidence base sets out indicative costs by main affected groups. Not all costs have been quantified at this stage. Total costs (PV) will be estimated for the final IA (expected early 2009).
£		
Average Annual Cost (excluding one-off)		
£		**Total Cost** (PV) **£**

Other **key non-monetised costs** by 'main affected groups'

BENEFITS

ANNUAL BENEFITS		Description and scale of **key monetised benefits** by 'main affected groups'
One-off	**Yrs**	The evidence base sets out indicative benefits by main affected groups. Not all benefits have been quantified at this stage. Total costs (PV) will be estimated for the final IA (expected early 2009).
£		
Average Annual Benefit (excluding one-off)		
£		**Total Benefit** (PV) **£**

Other **key non-monetised benefits** by 'main affected groups'

Key Assumptions/Sensitivities/Risks The assumptions are set out in the evidence sections. All estimates are highly dependent on the assumptions made. At this stage estimates should be treated with caution and are only indicative. Many of the costs and benefits are likely to vary according to location, which is not captured in the high level of analysis possible for this IA.

Price Base Year 2008	**Time Period Years** 30 years	**Net Benefit Range** (NPV) **£**	**NET BENEFIT** (NPV Best estimate) **£**

What is the geographic coverage of the policy/option?			England	
On what date will the policy be implemented?			Early 2009	
Which organisation(s) will enforce the policy?			CLG/LPAs	
What is the total annual cost of enforcement for these organisations?			£	
Does enforcement comply with Hampton principles?			Yes/No	
Will implementation go beyond minimum EU requirements?			Yes/No	
What is the value of the proposed offsetting measure per year?			£	
What is the value of changes in greenhouse gas emissions?			£	
Will the proposal have a significant impact on competition?			Yes/No	
Annual cost (£-£) per organisation (excluding one-off)	Micro	Small	Medium	Large
Are any of these organisations exempt?	Yes/No	Yes/No	N/A	N/A

Impact on Admin Burdens Baseline (2005 Prices)		(Increase – Decrease)
Increase of £	Decrease of £	**Net Impact £**

Key:	**Annual costs and benefits: Constant Prices**	**(Net) Present Value**

Evidence Base (for summary sheets)

A. What is the problem under consideration? Why is government intervention necessary?

The policy responds to two major challenges:
(1) Housing shortage; and
(2) the threat of climate change.

(1) Housing shortage

In 2004, the Barker Review of Housing Supply[1] recognised worsening housing affordability as a growing problem and called for a step change increase in housing supply. In response to the Barker Review, the Government increased its housing target for England to 200,000 net additions per annum by 2016.[2] This was subsequently increased to 240,000 net additions per annum, to deliver an additional 2m homes by 2016 and 3m by 2020.[3]

Key facts:

- Low level of housing supply compared to household projections
- Worsening housing affordability, reflecting a mismatch between supply and demand for housing. Average affordability in England, measured as the lowest quartile house price to lowest quartile earnings, had deteriorated from 3.65 in 1997 to 7.25 in 2007, its worst ever position
- Analysis shows that, if supply is not increased to meet rising demand, then long term affordability will continue to worsen. Beyond the immediate slow-down in the economy and housing market, income and earnings growth combined with demand from additional households will continue to drive up prices relative to earnings.[4]

(2) Threat of climate change

There is an overwhelming body of scientific evidence highlighting the serious and urgent nature of climate change, largely due to emissions of greenhouse gases as a result of human activities such as the combustion of fossil fuels and changing patterns of land use. The most recent Intergovernmental Panel on Climate Change (IPCC) report[5] shows conclusively that the debate over the science of climate change has moved on from whether or not it is happening to what we need to do about it.

1 Review of housing supply: Final report – Recommendations, Barker, 2004

2 Government's response to Kate Barker's Review of Housing Supply, ODPM, December 2005

3 Homes for the future: more affordable, more sustainable – Housing Green Paper, DCLG, July 2007

4 Affordability still matters, NHPAU, July 2008

5 Working Group I Contribution to the Fourth Assessment Report: Climate Change 2007: The Physical Science Basis. All Fourth Assessment Report documents are available from: http://www.ipcc.ch.

The Stern Review[6] shows that business as usual is not a viable option, warning that global warming could shrink the global economy by 20 per cent. It states, however, that if we take action now, it could cost just 1 per cent of global gross domestic product. The UK Climate Change Bill sets a target for the UK to reduce carbon dioxide emissions by 60 per cent below 1990 levels by 2050.

B. What are the policy objectives and the intended effects?

The policy objectives are:

- To deliver additional houses in new settlements, to contribute to the Government's ambition for 3m additional houses in England by 2020
- To deliver additional housing in new, highly sustainable developments which are zero carbon.

The PPS provides a planning framework for eco-towns. The PPS sets out what makes a new settlement an eco-town and the planning process necessary for them to be delivered efficiently and effectively.

The PPS sets out a range of minimum standards, which will be used to define an eco-town. The standards are consistent with Government's wider planning policies, but set more challenging and stretching standards than would normally be required for a development.

The eco-town developments will themselves be zero carbon and therefore directly contribute to reductions in the carbon footprints associated with the residents who live there. However, more significantly, the eco-towns will be an opportunity to learn and experiment with new ways of building sustainable communities and new ways of living. The eco-towns can then be exemplars for future development. There is potential to learn from the eco-town experience and to rollout the best solutions further, thereby contributing more significantly to the challenge of climate change.

C. What policy options have been considered? Please justify any preferred option.

There are many potential policy responses to the twin challenges of housing shortage and climate change.

Since 1997 the Government has implemented a range of measures to support increased housing supply, including a new planning policy statement for housing (PPS 3) and the creation of the National Housing and Planning Advice Unit (NHPAU) to provide independent advice and evidence on affordability and housing supply.

[6] The Stern Review on the Economics of Climate Change, Stern, 2006

More recently, the Government's Housing Green Paper[7] set out a range of measures to support a significantly increased ambition for housebuilding, including additional financial support for the Growth Areas and New Growth Points (NGPs); an additional round of NGPs; a new Housing and Planning Delivery Grant; action to permit applications for housing where councils have not identified enough land; action to encourage private developers to bring forward housing more quickly; and more use of public sector land for housing.

A wide range of potential options exists to address the threat of climate change. The UK Government has already implemented a variety of actions as outlined in the UK Climate Change Programme.[8] Many of these measures have been undertaken in partnership with the European Union, whilst others are UK-focused initiatives. In addition, the Government has implemented a variety of planning policies, as well as building regulations, that address climate change issues. Of particular relevance in terms of improving the carbon performance of new development, is Government's recent confirmation of a timetable for getting to zero carbon new homes by 2016[9] and the commitment to parallel activity for non-residential buildings.

The Government also recently introduced a new Planning Policy Statement: Planning and Climate Change. The PPS has three main aims: Firstly to ensure that developments brought forward reduce their carbon impact through appropriate choices of their location, their physical form and layout and the use of renewable and low-carbon energy. Secondly to ensure the planning process provides effective and positive support to proposals for renewable and low-carbon energy supplies. Thirdly, to shape sustainable communities that are resilient to the impacts of the climate change now accepted as inevitable, including more extreme weather events such as hotter and drier summers, periods of intense rainfall, flooding and rising sea levels.

This Impact Assessment is focussed on a policy option that responds to the twin challenges of housing shortage and climate change and reinforces other options already being implemented or explored.

D. Analysis of options and evidence base

This Impact Assessment considers two policy options:

(1) Small new town settlements – eco-towns

(2) Small new town settlements – 'standard' developments ('do nothing' scenario ie no Eco-towns PPS).

[7] Homes for the future: more affordable, more sustainable – Housing Green Paper (DCLG, July 2007)

[8] Climate Change The UK Programme (DEFRA, March 2006) See www.defra.gov.uk/environment/climatechange/uk/ukccp/index.htm

[9] Building a Greener Future: final policy statement (CLG, July 2007) see www.communities.gov.uk/publications/planningandbuilding/building-a-greener

Option 1: Small new town settlements – eco-towns

This is the preferred policy option: new settlements of between 5,000 and 20,000 homes which must demonstrate the highest levels of sustainable development and should act as exemplars for future developments.

These are to be delivered through the planning system. The eco-town planning policy statement (PPS), which this Impact Assessment is the subject of, provides the planning framework to support the delivery of eco-town developments.

The Government's Eco-towns programme has been developed with the aim of getting exemplar eco-towns off the ground quickly and in particular to bring forward a critical number of schemes to ensure that development is underway by 2016 with the first potentially starting on site as early as 2010.

Option 2: Small new town settlements – 'standard' developments ('do nothing scenario ie no Eco-towns PPS)

This is an alternative policy option for delivering additional housing through the planning system and is consistent with PPS3. Development is 'standard' in the sense of being in line with typical development standards and levels of sustainability. The developments are not designed to be exemplars.

The majority of housing growth has always been in our towns and cities and will continue to be. However, where the need and demand for housing is high, PPS3 advises that it will be necessary to identify and explore a range of options for distributing housing, including new free-standing settlements.

Both Options 1 and 2 aim to deliver additional housing in line with the Government's ambitious target of 2m additional houses by 2016 and 3m additional houses by 2020. The costs and benefits of additional housing have been set out elsewhere.

The diagram below, which is an extract from the Barker Review of Housing Supply interim report[10], illustrates the welfare implications of increasing housing supply. This impact assessment assumes that both policy options deliver the same amount of additional housing. This means that, in terms of the analysis below, the two policy options are broadly similar. The main difference is distributional, in terms of welfare gainers and losers, which is not depicted in the diagram below.

The additional costs of development would mainly fall on developers and the presumption is that these would largely be passed back to landowners[11] (who may also be developers). Planning permission for new town development is likely to result in considerable planning

[10] Review of Housing Supply – Interim Report, Barker (2003)

[11] There is no clear evidence that consumers would be willing to pay a significant premium to live in eco-homes. The price of new housing is therefore determined primarily by the second hand market for housing in general.

gain, so the higher standards for eco-towns seek to ensure that some of the value that the planning system creates is shared by the community more widely in terms of economic, social and environmental benefits.

Extract from Barker Review of Housing Supply Interim Report:

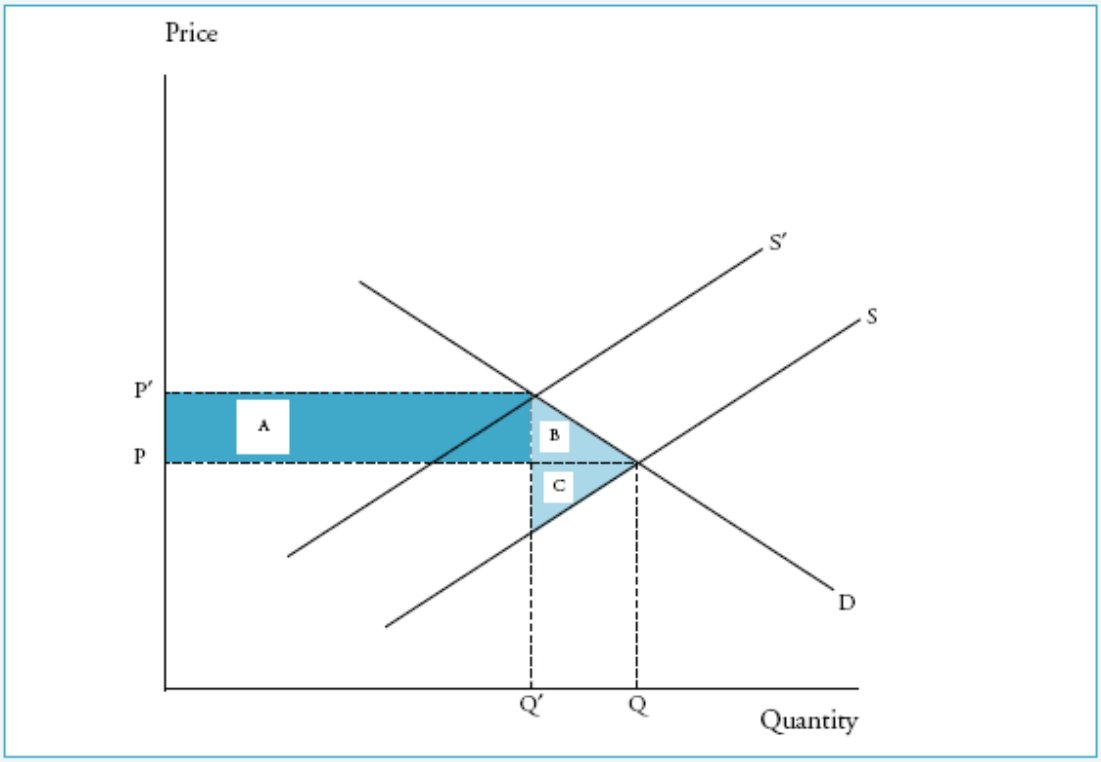
Box 1.1 Welfare loss due to housing undersupply[5]

The chart below illustrates how the welfare impact of a restricted supply of housing arises. The supply curve, S, represents the stock of housing at various prices. Higher prices lead to a higher stock level, as it becomes more profitable for housebuilders to supply housing at these higher prices. The demand curve, D, represents households' demand for housing at different prices. Lower prices make housing more affordable, which increases the amount of housing demanded.

Supply curve, S′, represents the housing stock on the basis that supply is restricted to below the level the market would want to build.

The impact of artificially reducing supply from S to S′ is shown by the shaded boxes. Box A represents the benefit that those inside the market (home owners and landowners) gain at the expense of those outside the market (home buyers). Boxes A and B represent the loss of consumer surplus, from fewer households acquiring housing (Q′ instead of Q), and those who do acquire housing have to pay a higher price (P′ instead of P).

The restricted supply also has an overall net cost to the housing market and the economy, shown by the deadweight areas, B and C, the overall welfare loss caused by fewer housing transactions. Fewer households will benefit from housing, and housebuilders and homeowners have less revenue from fewer sales, all of which reduces overall income and welfare.



It is unclear how much additional housing could be delivered through new settlements, but as an illustration 10 new settlements of 10,000 could deliver around 100,000 homes. The final number of eco-town settlements will depend on the final list of schemes and locations to be announced by Government in early 2009 and any additional schemes to be identified through the planning system. It will also depend on local planning decisions in response to any planning applications that may follow.

E. Evidence – impacts, costs and benefits

This section considers the impacts, costs and benefits associated with eco-towns (option 1) as opposed to standard new town developments (option 2). The analysis at this stage is incomplete. Further analysis will continue throughout the consultation period. **As part of the consultation we welcome views on the standards and any evidence on the impacts, costs and benefits of these**. For a full description of the standards and consultation questions, see *Planning Policy Statement: Eco-towns – Consultation* www.communities.gov.uk/housing/housingsupply/ecotowns/

This section of the IA should be read in conjunction with the Sustainability Appraisal (SA) of the Draft Eco-towns PPS. This incorporates the requirements of the European Strategic Environmental Assessment Directive[12], at a level proportionate to the PPS. The SA and IA have been developed independently of each other (the latter is an evidence based assessment by consultants Scott Wilson) and the emphasis of SA is slightly different to IA. SA seeks to identify and evaluate the impacts of a proposal on the economy, the community and the environment – the three dimensions of sustainable development – and suggest measures for improving the proposal's sustainability performance. The main focus of the IA is regulatory burden; it is a key tool in delivering better regulation, providing:

- a continuous process to help policy-makers fully think through the consequences of government interventions (whether domestic or internationally based) in the public, private and third sectors; *and*
- a tool to enable the Government to weigh and present the relevant evidence on the positive and negative effects of such interventions, including reviewing the impact of policies after they have been implemented.

Further work is required throughout the consultation period to draw together the findings of the IA and SA, together with any additional evidence, including consultation responses, to inform the final PPS.

[12] Directive 2001/42/EC on the assessment of the effects of certain plans and Programmes on the environment (the 'SEA Directive') implemented through The Environmental Assessment of Plans and Programmes Regulations 2004.

In addition to the SA of the draft PPS, Scott Wilson have also produced an SA of the Eco-towns Programme[13] i.e. the potential eco-town locations. This provides an assessment of the location-specific impacts – economic, social and environmental.

Why Eco-towns?

An eco-town is a new settlement of between 5,000 and 20,000 homes which demonstrates the highest levels of sustainable development and should act as an exemplar for future developments. The PPS, which this IA is the subject of, sets out the standards that eco-towns must achieve (further to those standards set out in existing planning and other relevant policies). The main standards set out in the draft PPS are considered below.

Eco-towns are an opportunity to deliver additional housing in new developments and they can:

- act as exemplars for future development, in terms of ways of living and application of new technologies;
- help to relieve pressure for development in urban areas and particularly in relation to their green spaces and public services;
- provide a good quantity of green space of the highest quality through their proximity to the natural environment;
- offer opportunities for space within and around the dwellings (particularly important for families with children);
- promote healthy and sustainable environments through "Active Design" principles and healthy living choices;
- offer opportunities for infrastructure that make best use of technologies in energy generation and conservation in ways that are no always practical or economic in other developments;
- use the opportunity to plan and deliver a locally appropriate mix of housing type and tenure to meet the needs of all income groups and household size; *and*
- take advantage of significant economies of scale and increases in land value to deliver new technology and infrastructure such as for transport, energy and community facilities.

Assessment of Eco-town Standards

The following standards (as set out in the draft PPS) are considered for this version of the IA:

- Master-planning and transition and development management
- Zero carbon development (domestic and non-domestic buildings)

[13] The Eco-towns Programme has been developed with the aim of getting exemplar developments off the ground quickly and in particular to bring up to 10 schemes and ensure than development is underway by 2016 with the first potentially on site as early as 2010. The Government has short listed a series of potential eco-town locations following an initial call for proposals.

- Transport
- English Partnerships space standards
- Lifetime homes standards
- Water
- Employment
- Green infrastructure and biodiversity
- Waste

The following are not covered in this version of the IA, but will be included in the final version of the IA to be published in early 2009:

- **Real time energy monitoring systems; real time public transport information and high speed broadband access**. These costs are expected to be a relatively small in the context of total development costs. The costs would be paid for by developers and largely borne by landowners. Some costs may be borne by utilities companies and passed on to consumers.
- **Affordable housing**. This is consistent with the PPS3 definition and policy approach. Both standard and eco-town development will need to comply with local planning policies on affordable housing provision.
- **Code for Sustainable Homes**. This IA only considers the cost implications associated with water and energy, which are likely to account for the majority of costs.
- **Local services**.

1. Master-planning and transition and development management

All eco-town planning applications will need to include a detailed master-plan and supporting documentation to demonstrate how the eco-town standards would be achieved and sustained. The purpose of this is primarily to provide evidence needed by the planning authority (normally the local planning authority) to decide on the merits of any planning application and to determine whether or not to grant planning permission.

Planning applications will be required to set out information that demonstrates a high level of engagement and consultation with prospective and neighbouring communities. Planning applications for eco-towns will also need to provide information on how core services, which underpin the ambition for eco-town residents to significantly cut their carbon footprint, such as public transport infrastructure and services, would be delivered and operational when the first residents move in.

The objective for eco-towns is to have settlements that enable households and individuals to reduce their carbon footprint to a low level. Eco-towns will need to make it easy for residents to adopt a more sustainable way of living and should be designed as healthy and sustainable environments encouraging healthy living. Eco-towns must allow the first residents to make sustainable choices from day one, in order to embed behaviour change and set an example for future residents. If the necessary infrastructure is not in place from day one, then residents may find it hard or be reluctant to change their behaviour at a later stage in the life of the development.

Costs – Developers would normally be expected to provide a detailed master-plan, but in the case of eco-towns they must provide additional evidence to demonstrate the requirements of the eco-towns PPS. This implies additional costs to developers (which are likely to be passed back to landowners).

In order to determine a planning application, planning authorities would normally consider the master plan and supporting documentation against relevant planning policies. The additional information to be submitted for an eco-town planning application, to be considered against the PPS, has resource implications for local authorities, in terms of time and expertise.

Benefits – The detailed master-plan and information on transition and development management will support effective decision-making by local planning authorities and ensure that eco-town development only proceeds if it meets the minimum standards. Following the grant of planning permission, the requirements will provide a strategy for development to ensure that the eco-town aims are achieved.

The requirements of the PPS should help to ensure that the benefits associated with more sustainable lifestyles will be realised. Some of the benefits are considered below.

Further information is required to quantify the costs and benefits.

2. Zero carbon in eco-towns

The definition of zero carbon in eco-towns is that over a year the net carbon dioxide emissions from all energy use within the buildings on the development are zero or below.

The policy aims not to be prescriptive in terms of how zero carbon development should be achieved. This means developers have the flexibility to find the most cost effective solution for their development.

In order to assess costs and benefits for the purposes of this IA, it is necessary to make some assumptions about how zero carbon would be delivered by eco-town developers. Domestic and non-domestic buildings are considered in turn. Housing will be the primary land use for new developments and home energy is likely to account for the majority of carbon dioxide emissions. Therefore, most of the costs and benefits are likely to relate to domestic buildings (housing).

DOMESTIC BUILDINGS

Costs – In July 2007 the Government announced its policy that all new housing will be zero carbon from 2016, with staged improvements in building regulations towards that target in 2010 and 2013. Government will be consulting further on the detailed definition of the zero carbon standards later this year.

Table 1: Government targets for new housing

Date	2010	2013	2016
Carbon improvement as compared to Part L (Building Regulations 2006)	25%	44%	zero carbon
Equivalent energy/carbon standard in the Code	Code level 3	Code level 4	Code level 6

Source: Building a Greener Future policy statement (Communities and Local Government, July 2007)[14]

Eco-towns must be zero carbon over the whole of development, so homes are only one part of the solution and it is for developers to decide how they will achieve zero carbon. However, the PPS requires homes to demonstrate high levels of energy efficiency in the fabric of the building, consistent with standards to be incorporated into Building Regulations from 2010 and the zero carbon standard from 2016, which will be the subject of future consultation. Homes must also achieve, through a combination of energy efficiency, on-site low and zero carbon energy generation and any heat supplied from low and zero carbon heat systems directly connected to the development, carbon reductions (from space heating, hot water and fixed lighting) of at least 70 per cent relative to current building regulations (Part L 2006).

The analysis below assumes that eco-town housing achieves at least 70 per cent carbon reductions relative to Part L from 2010, rising to 100 per cent from 2014. Housing in standard developments is assumed to achieve staged reductions in carbon emissions in line with government policy. All housing is assumed to reach zero carbon by 2016.

[14] www.communities.gov.uk/publications/planningandbuilding/building-a-greener

Table 2: Carbon reduction relative to Part L for new housing, standard development and eco-town development (assumed)[15]		
Year	**Standard development**	**Eco-town development**
2010	25%	70%
2011	25%	70%
2012	25%	70%
2013	44%	70%
2014	44%	100%
2015	44%	100%
2016	Zero carbon	Zero carbon
2025	Zero carbon	Zero carbon

Based on these assumptions, two scenarios are considered, for the purposes of illustration. The difference is that one includes wind power as a technology option (whilst recognising that wind resources are not uniform everywhere) the other does not.

Table 3a: Cost difference between standard and eco-town development in 2008 prices (£/unit): High scenario (assuming no wind power can be used)					
£/unit	**Detached (25%)**	**End-t/semi (21%)**	**Mid Terrace (27%)**	**Flat (27%)**	**Average unit**
Year built					
2010	£6,269	£4,088	£3,245	£3,975	£4,375
2011	£6,269	£4,088	£3,245	£3,975	£4,375
2012	£6,269	£4,088	£3,245	£3,975	£4,375
2013	£6,269	£4,088	£3,245	£3,975	£4,375
2014	£7,264	£5,238	£4,555	£4,908	£5,471
2015	£7,264	£5,238	£4,555	£4,908	£5,471
2016	£0	£0	£0	£0	£0
2025	£0	£0	£0	£0	£0

[15] For simplicity it is assumed that changes in the building regulations are complied with fully by developers with immediate effect. In practice, there will be a transitional period during which existing applications will continue to be built to the standards that applied when the application was submitted. It should also be noted that Part L 2006 covers only emissions associated with space heating, hot water and fixed lighting ("regulated emissions") whereas zero carbon standard to be introduced from 2016 will cover all energy use (i.e. including cooking and appliances too).

Table 3b: Cost difference between standard and eco-town development in 2008 prices (£/unit): Low scenario (assuming wind power can be utilised)					
£/unit	**Detached (25%)**	**End-t/semi (21%)**	**Mid Terrace (27%)**	**Flat (27%)**	**Average unit**
Year built					
2010	£1,244	£1,142	£1,149	£1,061	£1,147
2011	£1,244	£1,142	£1,149	£1,061	£1,147
2012	£1,244	£1,142	£1,149	£1,061	£1,147
2013	£1,244	£1,142	£1,149	£1,061	£1,147
2014	£453	£599	£818	£1,007	£732
2015	£453	£599	£818	£1,007	£732
2016	£0	£0	£0	£0	£0
2025	£0	£0	£0	£0	£0

Based on estimates in "Cost Analysis of the Code for Sustainable Homes: Final Report" CLG, 200816

This analysis did not estimate costs of achieving 70 per cent carbon reductions (a 70 per cent carbon reduction). Emerging analysis on the cost of achieving, to be published later, has been used to inform the analysis. In the case of wind power, the cost of achieving 70 per cent is a simple interpolation of cost estimates for 44 per cent and 100 per cent carbon reductions (as per the Code Analysis report, Communities and Local Government 2008).

The cost difference is large depending on the technology available. The feasibility of different technology types, such as wind power, depends on a number of factors including size, type and location of development. For eco-towns, location is likely to be the constraining factor.

In terms of total additional costs associated with eco-town development, this depends on the timing of housebuilding and the housing mix (the table above shows how the costs vary for different types of dwelling). The average unit is estimated based on an assumed housing mix as follows:

- 25 per cent detached
- 21 per cent end-terrace/semi
- 27 per cent mid-terrace
- 27 per cent flats.

This is in line with assumptions underpinning the cost analysis (see Cost Analysis of the Code for *Sustainable Homes: Final Report*, Communities and Local Government, 2008).

[16] www.communities.gov.uk/publications/planningandbuilding/codecostanalysis

The current cost estimates do not account for:

- economies of scale, which may be realised for eco-town development (due to the relatively large scale of development – 5,000 to 20,000 home)
- falling technology costs, which may benefit later developments
- operating and maintenance costs
- replacement costs at the end of the service life of energy technology.

The additional costs will be paid by developers of eco-towns, but the majority are likely to be passed back to landowners as developers reduce the price they will pay for land. This outcome could be explained because the price of new housing is determined primarily in the second hand market, which is likely to inhibit the ability of developers to pass on costs to buyers through a premium on new house prices, although it is important to note that some purchasers may well be willing to pay a premium initially for a high quality green new house.

Benefits – there are two main benefits from greener housing: carbon savings and fuel savings (lower household fuel bills associated with lower energy consumption). There may also be benefits in terms of learning that may benefit development more generally and support delivery of the Government's objectives for all new housing to be zero carbon from 2016. This fits with the objective for eco-towns to be exemplars.

Estimates for carbon savings are set out below. These are based on assumptions consistent with those for the preceding cost analysis. The net present value of savings is estimated over a standard 30 year period. Estimates for fuel savings are not presented here but will be included in the final IA.

Table 4: Net present value of carbon savings (30 year) per unit, for an eco-town development relative to a standard development at various years (2008 prices)

£/unit	Detached (25%)	End-t/semi (21%)	Mid Terrace (27%)	Flat (27%)	Average unit
Year built					
2010	£1,179	£856	£761	£680	£863
2011	£1,202	£873	£776	£694	£881
2012	£1,226	£891	£791	£707	£898
2013	£1,251	£909	£807	£722	£916
2014	£1,588	£1,153	£1,025	£916	£1,163
2015	£1,619	£1,177	£1,045	£934	£1,186
2016	£0	£0	£0	£0	£0

Social value of carbon (£/tonne CO_2) reductions is based upon DEFRA guidance on the Shadow Price of Carbon.17 2008 is the base year.

[17] www.defra.gov.uk/environment/climatechange/research/carboncost/pdf/HowtouseSPC.pdf

Carbon abatement per unit per year is based on reductions in total carbon emissions for the different house types built to current building regulations (see table below).[18] As an example, in 2010 a standard development would make a 25 per cent reduction per unit relative to Part L 2006 whereas an eco-town development would make a 70 per cent reduction from baseline. The additional carbon abatement associated with eco-town development is the difference. This is then valued by multiplying by the shadow price of carbon.

Table 5: Total carbon abatement (relative to base emissions)

CO_2 tonnes/yr	Detached	End-t/ semi	Mid Terrace	Flat	% reductions from base
Base regulated emissions[19] (total emissions)[20]	**2.34 (3.72)**	**1.7 (2.9)**	**1.51 (2.71)**	**1.35 (2.35)**	
	0.585	0.425	0.3775	0.3375	25
	1.0296	0.748	0.6644	0.594	44
	1.638	1.19	1.057	0.945	70
	2.34	1.7	1.51	1.35	100
	3.72	2.9	2.71	2.35	Zero carbon

The higher energy standards would help households reduce their fuel bills through both reduced consumption as a result of energy efficiency improvements to the building and potentially through lower fuel prices associated with low and zero energy sources. To some extent these savings could be reflected in home buyers' willingness to pay for housing (although there is no hard evidence that home buyers are willing to pay a premium for green housing). The carbon savings are a social benefit that will contribute to tackling the threat of climate change.

NON-DOMESTIC BUILDINGS

There is less available data on the impacts of building zero carbon non-domestic buildings than there is for homes. This means a number of assumptions have had to be made in order to quantify costs and benefits for the purposes of this assessment, and these may need to be revisited as new information becomes available.

[18] www.communities.gov.uk/publications/planningandbuilding/codecostanalysis

[19] www.communities.gov.uk/publications/planningandbuilding/codecostanalysis

[20] Total emissions include emissions regulated via Part L of the Building Regulations (space heating, hot water and fixed lighting) but also cooking and appliances too.

As with domestic buildings, costs and benefits of eco-towns are calculated with respect to standard developments. It is assumed that by 2019 all non-domestic buildings, whether in eco-town developments or standard developments, are zero carbon, based on the 2008 Budget[21] in which the Government announced they would consult on achieving this and therefore, costs and benefits apply only to buildings constructed before this date. The trajectory and mechanisms to achieve zero carbon for new non-domestic buildings will be the subject of a future consultation. In advance of this, this document therefore makes assumptions about staged reductions in carbon emissions with reference to the reductions for domestic buildings with an additional intermediate stage between 2013 and 2019. Table 6 lays out the reductions assumed for standard and eco-town developments to 2019. At each stage, the assumption is that eco-town developments are built to a higher standard than standard developments.

Energy use is estimated by square metre of floor space and differs depending on the building type. Buildings have been divided into three types: warehouse, shallow plan and deep plan, which cover the majority of non-domestic building types.

Table 6: Assumptions of carbon reductions used in cost/benefit analysis

Year	Carbon reductions	
	Standard developments (%)	Eco-towns (%)
2010	25	44
2011	25	44
2012	25	44
2013	44	100
2014	44	100
2015	44	100
2016	100	Zero
2017	100	Zero
2018	100	Zero
2019 onwards	Zero	Zero

Costs – The costs are calculated using baseline building costs and cost premiums from the UK-GBC report, Report on Carbon Reductions in New Non-Domestic Buildings[22]. The baseline building costs are given per square metre, assuming building to meet the standards in the 2006 building regulation. Cost premiums are estimates based on those in the report and adjusted by a weighted average of each of the building types in the three categories.

[21] www.hm-treasury.gov.uk/budget/budget_08/bud_bud08_speech.cfm

[22] www.communities.gov.uk/publications/planningandbuilding/carbonreductions

The report examines the differing costs of reaching zero carbon using on-site, near site and off-site renewable sources of energy. A mix of these solutions is assumed in the calculation of the cost premiums. The estimates for reductions under 100 per cent are assumed to be proportional to the cost premium of a 100 per cent reduction using offsite solutions. Care should be taken with these estimates of the cost premiums. As the UK-GBC report notes: "very few true zero carbon non-domestic buildings have been constructed in the UK; as a result there is little empirical evidence as to what a cost premium might be". These estimates are based on the assumptions made and, as with domestic buildings, there is scope for developers to meet the zero carbon target in a variety of ways.

The costs do not take into account the fact that the form of non-domestic buildings is likely to evolve in response to the policy target as has been seen with domestic buildings, or the effects of falling technology costs.

Table 7 shows the discounted cost per square metre of meeting the higher standards for non-domestic buildings in eco-towns, depending on the year of construction.

Table 7: Cost of building to higher standards in eco-towns (£/m^2)

Year built	Costs of meeting higher carbon reduction targets £ per m^2 (2008 prices)		
	Warehouse	Shallow plan	Deep plan
2010	17.01	10.70	42.35
2013	155.79	104.15	384.60
2016	15.42	10.41	36.71

The estimates for 2010 show the difference between building to a 25 per cent carbon reduction for standard developments and building so that carbon is reduced by 44 per cent in ecotowns. In 2013 costs are substantially more, reflecting the higher cost premium of building to Code Level 5 (100%) compared with building to 44 per cent. In 2016 the costs are less reflecting the smaller gap between building to Code Level 5 standard and Code Level 6.

There has been no attempt to calculate total costs at this stage, as much will depend on assumptions about when non-domestic buildings are constructed and what reduction targets have to be met for developers to achieve zero carbon across the development. The size, number and type of non-domestic buildings that will be constructed are also unclear at this stage.

Benefits – Benefits come from two sources: carbon savings and fuel savings. The timings of carbon reductions in eco-towns and standard developments are as outlined in Table 6.

CARBON SAVINGS

Carbon savings per square metre are measured by calculating the difference in carbon emissions[23] between non-domestic buildings in eco-towns and those in standard developments, based on the reduction in electricity and gas use. The 25 per cent, 44 per cent, and 100 per cent reductions are made to regulated fuel use. 47 per cent of electricity and 100 per cent of gas are assumed to be regulated based on typical use for Building Type 2 in Energy Consumption Guide 19[24]. Reductions for zero carbon are made to total fuel use. This reduction in carbon emissions is multiplied by the shadow price of carbon[25] to produce an estimate of the carbon saving. Table 8 shows the net present value of carbon savings for non-domestic buildings constructed in 2010, 2013 and 2016 and assumes a 30 year building life. After 2019, non-domestic buildings in both types of development are assumed to be zero carbon and there is no difference in carbon savings.

Table 8: Net present value of carbon savings by building type

	Carbon savings by building type £ per m² (2008 prices)		
Year built	Warehouse	Shallow plan	Deep plan
2010	3.83	8.12	7.91
2013	10.82	13.84	13.48
2016	4.36	8.89	9.64

FUEL SAVINGS

Table 9: Net present value of fuel savings by building type

	Fuel savings by building type £ per m² (2008 prices)		
Year built	Warehouse	Shallow plan	Deep plan
2010	13.73	19.31	19.32
2013	36.54	51.38	51.41
2016	22.64	46.17	50.05

Fuel savings are calculated by assuming total annual fuel costs are reduced by the percentage carbon reduction. No future changes in fuel prices are taken into account over the period. The difference in fuel costs between non-domestic buildings in eco-towns and in standard developments is calculated and then discounted over the 30 year building life. Table 9 shows how these savings vary depending on the year in which the building is constructed.

[23] Carbon impacts of electricity and gas are taken from Appendix A of The Role of Onsite Energy Generation in Delivering Zero Carbon Homes (Renewables Advisory Board)

[24] http://www.cibse.org/pdfs/ECG019.pdf

[25] www.defra.gov.uk/environment/climatechange/research/carboncost/pdf/HowtouseSPC.pdf

3. Transport

The PPS for eco-towns lays out the main requirements for transport in the new developments. The development "should be designed so that access to it, and through it, gives priority to options such as walking, cycling and public transport, thereby reducing residents' reliance on private cars". To support this goal homes must be within 10 minutes' walk of both neighbourhood services and frequent public transport services.

The costs and benefits arising from these requirements are likely to vary for individual eco-towns depending on which sites are chosen for development. The sites which are currently under assessment have a wide range of transport proposals to support the proposed development.

Costs – The necessity for eco-towns to prioritise walking, cycling and public transport may create costs which would not be faced by a standard development. Costs will include the necessary investment in public transport infrastructure, both to connect the development site to other urban centres externally, and, where necessary, to provide public transport within the new development. These costs are likely to vary widely depending on the sites chosen for development. If a site is chosen with existing infrastructure such as access to the rail network, then the costs of connecting the development site to the wider transport network will be reduced. If sites are chosen with no existing infrastructure, then this will tend to include the final costs. It is likely that bus routes will need to be added both within the development and connecting it to other transport hubs. Costs of additional vehicles and driver recruitment and training should therefore be taken into account. Where residents of new developments will be using existing infrastructure, there may be costs associated with increased congestion on existing rail routes or local roads.

The specification that all homes must be within 10 minutes of neighbourhood services may, depending on the development plan, impose extra costs on eco-towns which would not be incurred by a standard development through increased provision of such services.

Additional costs associated with the PPS standards are likely to be paid for by developers and passed back to landowners.

Box 1: Different locations, different costs

The Communities and Local Government progress report on eco-towns in July 2008 listed locations which are currently under assessment and gives an indication of how the final costs of transport infrastructure improvements are likely to vary depending on the final sites chosen, their size and proximity to nearby centres, particularly. At present there is also variation in how specific the outlined plans are.

Example 1: Weston Otmoor

This scheme proposes up to 15,000 new homes on a site three miles SW of Bicester and seven miles North of Oxford. The site is adjacent to the congested A34/M40 (Junction 9), which have very limited capacity to handle additional traffic from a large new development. The scheme will therefore require a major package of investment in public transport, demand management and improvements to the A34/M40 junction.

The promoter has put forward a potentially transformational transport proposal designed to ensure the impact on the external network would be neutral. This includes: taking traffic off the A34 through rail-based Park and Ride schemes; providing a fast, free and frequent tram system on site with rail connections into nearby Oxford; and restrictions on the flow of traffic from the site onto the A34.

Example 2: Marston Vale

The scheme proposes up to 15,400 new homes in a location that benefits from good rail access, with the Bedford-Bletchley local service and Midland Mainline and committed investment in dualling the A421 and improving J13. The site is well connected but will need to invest in public transport to provide sustainable alternatives to the car within the town and connections to nearby centres.

The promoter has proposed a Bus Rapid Transit system linking the site to both Milton Keynes and Bedford and integrating with Midland Main line and West Coast Main line. The proposal also includes a new rail hub at Lidlington on the Marston Vale line between Bedford and Bletchley

Benefits – The benefits arising from reduced numbers of car journeys, both within an eco-town development, and to and from it, will include a reduction in pollution and in greenhouse gas emissions, with associated effects on quality of life and the health of inhabitants. Increased walking and cycling could also lead to improved health within the community and associated savings in health spending.

The Commission for Integrated Transport point out, however, that travel within a community is small in terms of mileage when compared with external travel to and from a community (only 15 per cent of mileage is made on journeys less than five miles)[26]. Therefore greater benefits are likely to be gained from reducing car journeys to other urban centres outside the community itself.

The REAP data below suggests that the emissions resulting from transport are around 2.7 tonnes per person per year (23 per cent of total carbon dioxide emissions).

Table 10: Average CO_2 emissions of a UK resident, 2001

	Carbon dioxide emissions	
	Tonnes/capita	**Percent**
Housing	0.97	8
Home Energy	2.78	23
Transport	2.73	23
Food	0.99	8
Consumer Goods	1.78	13
Private Services	1.18	10
Government	0.98	8
Capital assets	0.80	7
Total	**11.87**	**100**

Source: Resource and Energy Analysis Programme (REAP) modelled using ONS prodcom data

There will also be social benefits from the restriction that homes must be within 10 minutes' walk of neighbourhood services which will facilitate access for people without cars.

4. English Partnerships space standards

English Partnerships (EP) requires homes to be built with minimum internal floor areas in relation to bedrooms and occupancy. The PPS requires all new homes to be built to these space standards.

[26] Commission for Integrated Transport, Land-Use and Transport: Settlement Patterns and the Demand for Travel, Stage 1 Baseline Report p.27

The EP space standards are as follows:

Table 11: EP space standards	
Unit size	**Sq m**
1 bedroom/2 person homes	51
2 bedroom/3 person homes	66
2 bedroom/4 person homes	77
3 bedroom/5 person homes	93
4 bedroom/6 person homes	106

Source: English Partnership Quality Standards, EP Nov 2007[27]

Costs – Minimum space standards may imply either that developments must be built to higher density or require additional land per dwelling. In either case there are cost implications. A greater per dwelling land requirement implies fewer houses can be accommodated within the boundary under a developer's ownership. The cost of land can therefore be estimated as the opportunity cost to the developer (the value of the lost homes less the costs associated with their construction). It may however be possible for some of this cost to be mitigated through re-design of the development to use land more effectively across different uses.

There is very little information on the floor-space of new housing, so it is difficult to estimate the value of any additional land requirements. However, in order to provide an indication of the likely additional space requirement, it is possible to compare the EP space standards (table above) with the Housing Corporation's minimum standards for social housing. These standards were used by BCIS to examine the cost implications of Lifetime homes standards (referred to below).[28] This indicates an average unit may require around 10 per cent more land but this may be less after taking into account the possibility that this may to some extent be mitigated through re-design of developments. This would imply a one-off cost to developers to re-draw development plans.

Ten per cent extra land is estimated to cost an additional £5,568 per average dwelling (10%*30%*£185,610). Taking into account the possibility of mitigation through design, this figure may be considerably lower. A 5 per cent land requirement would mean an extra £2,784 per average dwelling.

Main assumptions:

- Housing mix as before (25 per cent detached, 21 per cent end-terrace/semi, 27 per cent mid-terrace and 27 per cent fats). Based on the assumed housing mix the weighted average property price is estimated to be £185,610

[27] www.englishpartnerships.co.uk/qualityandinnovationpublications.htm#qualitystandards

[28] Pg. 3, "The Cost of Building To The Lifetime Homes Standard" BCIS on behalf of the Housing Corporation (May 2007)

- Value of residential (per unit) land is assumed to be 30 per cent price of housing (2008 prices).

It may be that some houses are being built above or below the HC standard, so the actual cost of the PPS requirement for housing to meet the EP space requirements could be either higher or lower.[29] In some cases local planning authorities may have adopted minimum standards, or market conditions may demand larger units. This would imply a lower additional cost associated with compliance to the EP space standard.

The expectation is that any additional costs would largely be borne by landowners, capitalised in lower land values for residential land. However, to some extent, home buyers may be willing to pay some premium for more spacious housing but there is no evidence on what this premium might be. It is probably fair to say however that the premium would not be large enough to offset the additional costs to be borne by landowners and developers (see benefits below).

Benefits – EP has set out a number of benefits as part of the rationale for their space standards, including the following:

- To prevent unsustainable housing types that the next generation may not want
- To prevent smaller flats and houses which have limited scope for adaptability and flexibility and do not support the needs of growing families and wider choice
- Social cohesion issues that are raised by small homes which do not support the needs of people living in them (eg children who have no space at home to study or play
- Smaller homes have less room for environmental features and cannot meet other requirements like Lifetime Homes (see above).[30]

As noted above, some of the benefits may be reflected in a premium for new housing, which home-buyers may be willing to pay for the benefits associated with additional space. However, this premium would not offset the additional costs to the developer (or landowner). If it were profitable to the developer to build larger homes, then minimum standards would not be required. Most of the benefits are likely to be 'external' benefits. Further evidence is required to value these.

[29] A survey of social housing for the BCIS study (2007) found that 34% of units did not exceed HC's minimum standards.

[30] www.englishpartnerships.co.uk/qualityandinnovationpublications.htm#qualitystandards

5. Lifetime homes standards

All new housing in eco-towns must be built to Lifetime Homes Standards. Lifetime Homes Standards are a set of simple home features that make housing more functional for everyone including families, disabled people and older people. They also include future-proofing features that enable cheaper, simpler adaptations to be made when needed. For example, they make getting in and around the home easy for everyone, whether they have small children or limited mobility. Key features of Lifetime Homes include level or gentle sloping approach to property, doors wide enough to allow wheelchair access, living room at entrance level, entrance level toilet, walls able to take adaptations, bathroom giving side access to toilet and bath, low window sills, and electrical sockets and controls at convenient heights.

Costs – There are a number of potential costs. These have been assessed by BCIS on behalf of the Housing Corporation and subsequently updated for Communities and Local Government.[31] The additional physical requirements are estimated to be £150 for flats and £900-£950 for houses. The extra space requirement is estimated to be 1.2-3.3 per cent for flats and 1.7-2.4 per cent for houses (relative to the Housing Corporation's minimum standards for social housing). The marginal cost of the extra space requirement (excluding land) is estimated to be £300-£350 for flats and £600 for houses.

The cost estimates below are illustrative and based on the BCIS analysis. In terms of standard housing development (baseline), affordable housing (assumed 30 per cent of all total) is anticipated to meet LTH standards by 2011. This is in line with the Government's ambition as set out in "Lifetime Homes, Lifetime Neighbourhoods" (Communities and Local Government, Feb 2008).[32]

Other assumptions include:

- Housing mix as before (25 per cent detached, 21 per cent end-terrace/semi, 27 per cent mid-terrace and 27 per cent flats)
- It is assumed that EP space standards (see above) are likely to meet the functional space requirements associated with Lifetime homes (1.2-3.3 per cent for flats and 1.7-2.4 per cent for houses). The costs therefore do not include the opportunity cost of land associated with the additional space requirements. The estimates do however include marginal build costs (as per BCIS analysis)
- Affordable housing (30 per cent of new housing) is assumed to be 100 per cent policy compliant by 2011.

[31] "The Cost of Building To The Lifetime Homes Standard" BCIS on behalf of the Housing Corporation (May 2007)

[32] www.communities.gov.uk/documents/housing/pdf/lifetimehomes.pdf

Table 12: Cost difference between standard and eco-town development in 2008 prices (£/unit)					
	Detached (25%)	**End-t/semi (21%)**	**Mid Terrace (27%)**	**Flat (27%)**	**Average unit**
2010	£1,550	£1,550	£1,550	£500	£1,267
2011	£1,085	£1,085	£1,085	£350	£887
2012	£1,085	£1,085	£1,085	£350	£887
2013	£1,085	£1,085	£1,085	£350	£887
2014	£1,085	£1,085	£1,085	£350	£887
2015	£1,085	£1,085	£1,085	£350	£887
2016	£1,085	£1,085	£1,085	£350	£887

It should be noted that the above costs are indicative. BCIS are currently revisiting the estimates of the cost of building to the Lifetime Homes standard upon which the May 2007 Housing Corporation report is based. The costs may be considerably lower depending on the current size of new homes and policy compliance to LTH standards by development in general.

The costs will be paid by developers, but are likely to be borne by landowners as developers are likely to reduce the price they will pay for land.

Benefits – A study by Cobbold (A cost benefit analysis of Lifetime Homes, 1997) sought to explore the benefits of Lifetime homes. Key points include:

- Considerable cost is involved in providing adaptations to the homes of disabled people, much of it met from the public purse. Much of the future spending on such adaptations, likely increasing as the population ages, is unavoidable as it entails adaptation to the existing housing stock. However, the future growth of such expenditure would be reduced if all new dwellings were built to the Lifetime Homes standard;
- The cost of residential care is substantially higher than home-based care. Building to the Lifetime Homes standard reduces, or delays, the need for moves into residential care. Similarly, building to the Lifetime Homes standard could reduce the demand for expensive temporary residential care in the event of, for example, hospital discharges in the absence of suitable permanent accommodation. Further, greater provision of Lifetime Homes could secure considerable cost savings by freeing up acute hospital beds occupied by those who would be otherwise discharged, but for a dearth of suitable accommodation;

- Adaptation that meets the Lifetime Homes standards is a lengthy process, often taking in excess of 12 months. Additional cost is borne through the requirement of many disabled people to have extra home-based care provided until adaptations are complete;
- Homeowners and housing providers have to incur the significant cost of the occupier moving home where cost-effective adaptations to meet need cannot be made. Building to Lifetime Homes standards would reduce the cost of such 'forced' moves. Similarly, greater provision of Lifetime Homes would reduce the cost of removing adaptations necessitated by the recipient of the adaptations vacating the adapted dwelling.

6. Water

The PPS sets a number of standards in relation to water and requires eco-towns to be ambitious in terms of water efficiency across the whole development, particularly in areas of serious water stress. Eco-towns in areas of water stress should aspire to water neutrality, ie achieving development without increasing overall water use across a wider area.

Costs – The costs are likely to vary depending on location eg areas of high water stress are likely to bear higher costs. As an illustration, the table below shows estimates from the Code Study final report (2008) associated with code level 5 of the Code for Sustainable Homes (internal potable water consumption). Water neutrality could add significantly to these costs as development would need to pay for measures to reduce demand from existing households. This may include retrofitting existing buildings with water efficient products.

The majority of costs are likely to be paid for by developers and passed back to landowners in the form of lower land prices. However, some costs may be paid for by water companies and ultimately recouped from customers (households and businesses).

Table 13: Cost of reaching Level 5 of the Code for Sustainable Homes (internal potable water consumption), £/unit (2008 prices)

Detached (25%)	End-t/semi (21%)	Mid Terrace (27%)	Flat (27%)	Average unit
£2,625	£2,625	£2,625	£885	£2,134

Based on estimates in Cost Analysis of the Code for Sustainable Homes: Final Report, Communities and Local Government, 2008[33]

[33] www.communities.gov.uk/publications/planningandbuilding/codecostanalysis

Further information is required to fully quantify the costs.

Benefits – The main benefits will come from financial savings for households through reduced water bills, and a reduction in energy used for water processing if water consumption is reduced. If a standard development meets the standards required for Code Level 1 and 2 usages would be restricted to 120 litres per person per day. The Code Level 5 and 6 level of 80 litres per person per day then represents a drop of a third in water consumption. Taking an average household size of 2.3[34] and assuming a saving of 1p for every 10 litres saved[35], this gives an average household saving of £34.16.

As an energy-intensive industry the water industry is responsible for approximately 4 million tonnes of greenhouse gas emissions (CO_2 equivalent) every year.[36] For the standard development option, there will be increased demand for potable water from the additional households being brought into an area. This increased demand will be reduced under the eco-towns option where water is being used more efficiently or eliminated altogether if the development achieves water neutrality. This in turn will reduce energy use and greenhouse gas emissions from the water industry in relation to the standard development option.

7. Employment

The PPS requires that planning applications be accompanied by an economic strategy that demonstrates how access to work will be achieved. There must be facilities to support job creation in the town and as a minimum there should be access to one employment opportunity per new dwelling that is easily reached by walking, cycling and/or public transport.

Costs – The main cost is potentially land for the provision of employment space within the boundary of development. In order to provide employment opportunities that can easily be reached by walking and cycling, then employment opportunities must be in close proximity to housing. Residents are also more likely to use public transport for shorter distance commutes.

If employment opportunities are not available on site, then the site must be adequately connected to nearby employment centres by good quality public transport systems. The potential cost of this is considered elsewhere in this IA.

Both a standard new town and an eco-town would require a certain amount of local service and employment provision. There are likely to be jobs in schools, health care centres and so on. However, an eco-town would need to provide a higher level of employment within the town, in order to contribute to a range of sustainable outcomes.

[34] The 2002 General Household Survey

[35] Water UK www.water.org.uk/home/resources-and-links/waterfacts/waterprices

[36] Water UK (www.water.org.uk/home/policy/climate-change/briefing-paper)

A higher ratio of jobs per homes implies fewer houses could be accommodated within the boundary under a developer's ownership (as compared with a standard new town development). The cost of land can therefore be estimated as the opportunity cost to the developer (the value of the lost homes less associated costs of development). Against this it is necessary to consider the value of employment land (a benefit) less associated development costs (see below).

For illustration purposes it is possible to consider the additional employment space required to provide jobs for eco-town residents.

The table below shows estimates the potential job requirement for new housing. This varies according to assumptions around housing mix, occupancy and level of economic activity.

Table 14: Estimate of jobs requirement per house

(1)	Occupancy (people/house)	2.98 (consistent with earlier assumptions)[36]	2.34 (England average)
(2)	% working age	75%	75%
(3)	% employed	60%	60%
(1)*(2)*(3)	Jobs required per home	1.34	1.05

Sources:
Housing and Planning Key Facts (England average household size)[38]
National Statistics (employment and population figures)[39]

The additional space requirements associated with eco-town development are hard to estimate as the difference in employment space provision above standard development is unclear and is likely to vary on a site-by-site basis.

[37] Occupancy rate is higher than the England average due to composition of housing assumed ie 25 per cent detached, 21 per cent end-terrace/semi, 27 per cent mid -terrace and 27 per cent flats

[38] www.communities.gov.uk/documents/housing/pdf/920785.pdf

[39] www.statistics.gov.uk/StatBase/Product.asp?vlnk=1944

Table 15: Employment land requirement per house, illustrative example				
	Job provision in development		**Employment land requirement***	**Cost of employment land provision*** **
	per unit	% of requirement (1.34 per unit)**	Ha/unit	£/unit
Eco-towns	1.0	75%	0.0067	£14,934
Standard	0.7	50%	0.0045	£9,956
Difference			0.0022	£4,978

*Assumes a land ratio of 1 ha per 150 jobs, based on a mix of use classes as follows: B1 – 1 ha per 200 jobs; B2 – 1 ha per 135 jobs; B8 – 1 ha per 99 jobs. Source: "Bedford Growth Area Study" Entec (2003)[40]

**Consistent with assumptions in previous table

***Assumes residential land less costs (residual land value) is 30%*£185,610 per unit, consistent with earlier assumptions. Average density is assumed to be 40 dph, so per unit housing land requirement is 1/40 = 0.025.

The expectation is that the cost would largely be borne by landowners, capitalised in lower land values for residential land. However, to some extent, the availability of employment opportunities may increase demand for housing and thereby increase the price home-buyers are willing to pay. This premium is unlikely to offset the additional cost to developers (landowners) otherwise it would be profitable for the developer to deliver more employment space without the need for minimum standards.

Benefits – The private benefits of additional employment space are reflected in its market value. This benefit is expected to accrue to developers and landowners and to some extent would offset foregone value of housing land (as per table 10). The difference between housing and employment land values will vary depending on location and employment use category.

The table below from the VOA shows the range of typical Class B1 values reported by District Valuers together with the typical value for each region.[41] These values should be regarded as illustrative.

[40] www.southeast-ra.gov.uk/planning_miltonkeynes2.html

[41] www.voa.gov.uk/publications/property_market_report/pmr-Jul-08/industrial_land.htm#class_b1_land

Table 16: Typical Class B1 land values			
Region	**From £s per ha**	**To £s per ha**	**Typical £s per ha**
South East	300,000	3,150,000	1,637,000
Eastern	650,000	2,750,000	1,389,000
England and Wales (excluding London)	100,000	3,150,000	868,000

The preceding analysis indicated a potential increase in employment space provision of 0.0022 Ha per unit at an estimated cost of £4,978 per unit. Based on the range of typical land values reported above, the private benefit could of the order of £1,910 to £3,601.

There may be additional benefits not fully reflected in the market price for employment land, for example benefits to residents in terms of local employment opportunities and cuts in commuting times. This has benefits in terms of quality of life and fewer transport-related carbon emissions.

8. Green infrastructure and biodiversity

An eco-town requires extensive, strategically planned and managed green space to achieve an acceptable level of environmental quality and to be able to function in a sustainable way, in terms of its own internal operations and its impact on the wider environment. When properly planned and designed, it can enhance the existing landscape character. The PPS requires 40 per cent of the eco-town's total area to be allocated to green space, of which at least half should be public and consist of a well managed, high quality green/open spaces which are linked to the wider countryside.

Proper provision for biodiversity that is effectively managed can allow the town to contribute to national and international targets to protect important species and habitats. This in turn can ensure biodiversity has a long-term future and is an effective component of local, national and international ecosystems which provide a range of services, such as flood attenuation, pollution control, and carbon sequestration.

Green space and provision for biodiversity can have a positive impact on the health of individuals through healthier lifestyles. This in turn can reduce the demand on the National Health Service. Education, the economy and the community can all be affected in a positive way by green space and biodiversity.

Costs – Land used for green space and biodiversity will not be available for other uses. This is an opportunity cost. There will be costs associated with the design of the town. It will be important that the design provides for the 40 per cent green space to be distributed across the whole town and not just at one or two large sites. These spaces should represent a network with individual sites linked physically or functionally.

The spaces should also represent a range of sites, habitats and environmental features delivered at a range of scales from small green spaces within individual neighbourhoods to more extensive nature reserves, parks and other sites serving the whole community. The town should also be linked physically, functionally and aesthetically to its wider landscape setting.

The green infrastructure should be designed to protect and enhance existing important sites, species populations, habitats and landscapes, especially those that have statutory protection nationally or internationally. Surveys by qualified experts will need to be undertaken to record the existing biodiversity and landscape features to ensure development seeks to limit any damage and where this is not possible to put in place mitigation measures or provide compensatory land of equal value to the biodiversity and other users.

The costs identified would be paid for by developers and landowners. It is likely that developers would be able to pass back the additional costs to landowners by paying a lower price for land that reflects the both direct and indirect costs. It is possible that some costs may be passed forward to home buyers if they are willing to pay a premium for the benefits associated with a high quality environment.

Further information is required to quantify the costs.

Benefits – There are economic, social, educational, health and quality-of-life benefits from providing green infrastructure and taking account of biodiversity in eco-towns. There is evidence that green space and tree-lined streets in an urban environment can improve life expectancy and decrease health complaints. Access to green space to facilitate 30 minutes of moderate physical activity could help save the NHS £61 per person per annum and benefit the economy by £293 per person per annum.[42] Trees also reduce air pollution, which has health benefits.

Healthy, biodiversity-rich areas can provide a range of recreational activities, such as walking, bird watching and fishing that improve the quality of life. They can also provide a stimulating environment in which children can play and learn. These in turn help to create a strong, cohesive community. A high-quality environment can also attract and retain inward investment and a skilled workforce which adds to the economy of the town and surrounding areas.

Wetlands can also provide a natural flood defence. The value of this service has been estimated at £1,279 per hectare per year (Eftec, 2005).[43]

[42] *Natural Fit, Can Green Space and Biodiversity Increase Levels of Physical Activity?* (Bird, W, 2004 for the RSPB) www.rspb.org.uk/Images/natural_fit_full_version_tcm9-133055.pdf

[43] *England's Eco-systems Services* (Eftec, 2005 for English Nature) www.eftec.co.uk/eftec_reports/eftec-Englands_Ecosystems-128.pdf

The value that society places on different types of land has been estimated as follows (cited in the Barker Review Interim Report, 2004). This indicates that wetlands and urban green spaces are valued more highly than agricultural uses.[44]

Land Type	Present benefit (per hectare per year, 2001)	Net present value of future benefits[2]
Urban core public space (city park)	£54,000	£10,800,000
Urban fringe greenbelt	£889	£177,800
Urban fringe forested land	£2,700	£540,000
Rural forested land	£6,626	£1,325,200
Agricultural extensive	£3,150	£630,000
Agricultural intensive	£103	£20,600
Natural and semi-natural wetlands	£6,616	£1,323,200

Source: ODPM Appraisal Guidance, Valuing the External Benefits of Undeveloped Land – A Review of the Economic Literature.

[1] These values were assessed using contingent valuation methods. This asks a cross section of people how much they would be willing to pay to maintain a piece of land in its existing use.

[2] This is the value today of the future benefits from land in different uses. It assumes a rate of return of 3.5 per cent (this is the rate at which future benefits are discounted over time). It also assumes an increase in willingness to pay of 3 per cent (this is the additional amount that people may value land's amenities over time).

9. Waste

Eco-town planning applications will need to include a sustainable waste and resources plan, covering both domestic and non-domestic waste, which is more ambitious than current national targets. The Waste Strategy for England (2007) set national targets for waste for 2020 as follows:

- Residual waste reduction per person (amount left after reuse, recycling and composting)– from 370 kg in 2005 to 225 kg in 2020
- Household re-use, recycling and composting – from 27 per cent in 2005 to 50 per cent in 2020
- Residual waste recovery (recycling, composting and energy recovery) from 38 per cent in 2005 to 75 per cent in 2020.

These targets are national average figures; encouraged by Defra and Communities and Local Government, most local authorities (over 80%) have set themselves one or more Local Area Agreement waste targets based on one or more of the parameters above – in a number of cases the targets set are significantly above the national waste strategy targets.

The Strategy identified a strong case, on carbon grounds, for promoting Combined Heat and Power (CHP) as a favoured form of energy recovery from waste, and this will need to be considered for eco-towns.

[44] www.hm-treasury.gov.uk/media/7/B/barker%20_review_foretoch3_396.pdf (pg.36)

The Sustainable Construction Strategy (2008) includes a target to halve construction, demolition and excavation waste going to landfill in England by 2012 as a stepping stone to a longer-term ambition of ending the disposal of CD&E waste in landfill. Eco-towns need to be at the forefront of reducing CD&E waste to landfill, ensuring that no construction, demolition and excavation waste is sent to landfill, except for those types of waste where landfill is the least environmentally damaging option.

Costs – Key design features to facilitate meeting these targets are likely to include storage areas for waste for recycling, as poorly designed facilities (or inadequate facilities) are known to push down recycling rates. If these facilities are designed in from the start, costs can be expected to be low and quite likely no higher than what would apply otherwise.

In terms of developing capacity for recycling, by 2020 it is likely that most authorities will have in place reuse or recycling arrangements for all of the priority materials, with the exception of wood, which it may make greater sense from a carbon point of view to recover as energy. On that basis, it seems unlikely that there would be significant or any extra costs for eco-towns.

The costs of CHP are relatively site-specific; but it is generally much easier and cheaper to adopt in new settlements where it can be designed in from the start (eg to use a communities' waste to heat blocks of flats or other public buildings). For this reason, there should be a much higher likelihood of successful adoption of CHP in eco-towns than in average places. Bearing in mind that the proposed requirement is of serious consideration rather than for firm adoption, the costs should be low, with carbon benefits, however, from adoption.

Generally newer areas, areas that are not in inner cities and areas with well designed buildings and with a newer influx of residents are likely to do considerably better against waste targets than the average: not only can collection and disposal arrangements be designed around them, but new residents will not have become accustomed to a particular kind of service already and so will be less affected by having to change their behaviour. These factors can all be expected to apply to eco-towns.

Putting all these considerations together, the cost impacts of adopting these proposals on waste seem modest and in many cases probably no more than what would have occurred anyway.

Benefits – As a society, we are consuming natural resources at an unsustainable rate. If every country consumed natural resources at the rate the UK does, we would need three planets to live on. The most crucial threat is from dangerous climate change. Each year, we generate about 100 million tonnes of waste from households, commerce and industry. Most of this ends up in landfill where the biodegradable part generates methane (a potent greenhouse gas) while valuable energy is used in extracting and processing new raw materials.

Our aim must be to reduce waste by making products with fewer natural resources. We must break the link between economic growth and waste growth. Most products should be re-used or their materials recycled. Energy should be recovered from other wastes where possible. For a small amount of residual material, landfill will be necessary.

The dividends of applying the waste hierarchy will not just be environmental. We can save money by making products with fewer natural resources, and we can reduce the costs of waste treatment and disposal. Waste is a drag on the economy and business productivity. Improving the productivity with which we use natural resources can generate new opportunities and jobs.

The financial benefits of reducing CD&E waste to landfill are clear. Materials are a valuable commodity and landfill tax, which will rise in 2010/11 to £48/tonne (£2.5/tonne for inactive waste), offers a clear financial incentive to avoid disposal in landfill. In addition, initial analysis of the benefits of Site Waste Management Plans, demonstrates that significant cost savings can be made by the introduction of good construction waste management practices. WRAP has estimated a net saving potential of £71,000 on a 100 dwelling construction project by reducing waste to landfill compared to baseline practice.

The benefit of including these factors as requirements is to stimulate the design thinking at the start and hence to ensure that they are allowed for at the design stage when the costs will be lower, and the benefits higher, than if they are only built in at a later stage.

D. Future monitoring and evaluation

This Impact Assessment provides a broad indication of the impacts associated with Eco-town developments, as specified by the PPS. Government will continue to assess the evidence including any additional information that may come through the consultation process. This will inform the final PPS to be published in early 2009.

Following publication of the PPS, it will be necessary to monitor the policy to assess the actual impact on planning decisions, development and the key outcomes which the policy aims to support, in particular to help eco-town residents significantly reduce their carbon footprint.

Government will continue to closely monitor the schemes to be announced in early 2009 as preferred bidders ie those schemes with strong potential to become eco-towns. An assessment process is currently underway to inform decisions on a final list of schemes for announcement early next year. This includes an independent assessment of financial viability and deliverability.

All eco-towns will be monitored through regional and local monitoring frameworks. Regional Planning Bodies and Local Planning Authorities will be required to monitor the implementation of their spatial policies as set out in the Regional Spatial Strategy and in development plan documents at the local level. Regional Planning Bodies and Local Planning Authorities should set out in their Annual Monitoring Reports indicators for monitoring the sustainability of eco-towns in their region/district.

Specific Impact Tests: Checklist

Use the table below to demonstrate how broadly you have considered the potential impacts of your policy options.

Ensure that the results of any tests that impact on the cost-benefit analysis are contained within the main evidence base; other results may be annexed.

Type of testing undertaken	Results in Evidence Base?	Results annexed?
Competition Assessment	No	Yes
Small Firms Impact Test	No	Yes
Legal Aid	No	No
Sustainable Development	Yes	No
Carbon Assessment	Yes	No
Other Environment	Yes	No
Health Impact Assessment	No	No
Race Equality	No	No
Disability Equality	No	No
Gender Equality	No	No
Human Rights	No	No
Rural Proofing	No	Yes

Annexes

Specific Impact Tests

Competition Assessment

The Eco-towns PPS seeks to clearly establish the concept of sustainable, "linked" new settlement in the planning system. Once established, developers will have a clear indication of the key planning tests required to be met. Therefore, such clear establishment of the eco-town concept is likely to be a signal to developers to compete to provide housing that meets these key planning tests. Nil detriment to competition is envisaged. Rather, the Eco-towns PPS is likely to incentivise innovation in the design and construction of sustainable new settlements, and so should help to usurp the current competitive advantage of large firm development based upon well-established pattern book design.

Small Firms Impact Test

There is currently a heavy bias toward large firms in the submission of outline planning applications for housing development on the scale envisaged for Eco-towns (5,000 to 20,000 dwellings). The Eco-towns PPS is unlikely to alter this bias. However, detailed planning applications in designated Eco-town areas are likely to be sought by small firms. Small, medium and large developers alike will be required to meet the same set of key planning tests established in the Eco-towns PPS in order to receive planning full planning consent. Crucially, all firms will be required to understand and implement more stringent standards than those currently in place, which imposes an additional cost burden on all. Given that small firms are less able to absorb additional cost than larger, better resourced firms, a marginal detriment to small firms is envisaged.

Rural Proofing

Eco-towns will provide new housing in relatively rural locations. Many such areas suffer from a lack of housing and affordability problems. The Affordable Rural Housing Commission found evidence of an acute lack of social housing – only 5 per cent of houses in villages are social housing compared to a national average of 23 per cent.[45] New development may also bring other benefits to rural populations, such as improved connectivity to higher order centres; new local services such a schools and shops and potential regeneration benefits.

There may be concerns about increased urbanisation, but the aim for eco-towns must be to mitigate the potential impacts of urbanisation through significantly higher sustainability standards. The PPS sets very high standards for development, which should reduce the impacts associated with urbanisation. For example, the PPS sets a target for significant modal shift toward non-car modes of transportation. The PPS also requires 40 per cent of an eco-town's total area to be allocated to green space, thereby helping to maintain a rural feel. The PPS makes clear that planning permission may not be granted for proposals which are likely to have a significant adverse impact on the natural environment and biodiversity.

[45] www.defra.gov.uk/rural/arh/commission-report.htm

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