



Impact Assessment
Planning Policy Statement: eco-towns



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Planning Policy Statement: eco-towns

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Summary: Intervention and Options

Department /Agency: CLG	Title: Impact Assessment of Planning Policy Statement: eco-towns	
Stage: Final	Version: 2	Date: July 2009
Related Publications: Planning Policy Statement: eco-towns		

Available to view or download at:

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 under PSA 20 to deliver net housing additions of 240,000 per year by 2016, helping to meet housing need and tackle long term affordability. Eco-towns will be built to higher sustainability standards, in order to drive progress and support innovation in helping to 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?

Planning Policy Statement (PPS): eco-towns is intended to:

- a. support the delivery of additional housing in new settlements, to contribute to the Government's ambition for net housing additions of 240,000 per year by 2016; 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.

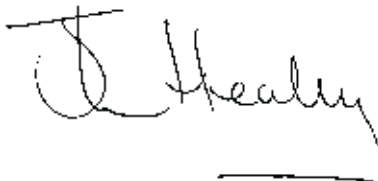
When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects?

A review of actual impacts is expected in three years time. Further discussion of future monitoring and evaluation is at section F.

Ministerial Sign-off

“I have read the Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impacts of the policy, and (b) the benefits justify the costs.”

Signed by the responsible Minister:



A handwritten signature in black ink, appearing to read 'E. Healy', is written over a horizontal line. The signature is cursive and somewhat stylized.

Date: 16 July 2009

Summary: Analysis & Evidence

Policy Option:

Description: **Planning Policy Statement:
eco-towns**

ANNUAL COSTS		Description and scale of key monetised costs by 'main affected groups' The costs are mainly development costs, which are likely to be borne primarily by landowners. A more detailed description of the costs and benefits is set out in the evidence section.
One-off (Transition)	Yrs	
£700-1400m	20	
Average Annual Cost (excluding one-off)		
£ not estimated		Total Cost (PV) £700-1400m
COSTS	<p>Other key non-monetised costs by 'main affected groups'</p> <p>Many of the costs of developing an eco-town are likely to vary significantly according to location and specific context, which is not captured in the high-level analysis possible for this Impact Assessment (IA). Where possible, the evidence base presented here provides a description of the likely nature of these costs and states where and how they are expected to be borne. The quantified costs for this IA are one-off costs associated with construction; on-going costs (beyond the construction phase) have not been quantified though are likely to be small relative to the one-off costs.</p> <p>In addition to this, a detailed financial viability appraisal has been prepared, with input from external advisers, in relation to the short-listed eco-town locations. Further to this, a Sustainability Appraisal (SA) has been undertaken both of the PPS, and of each of the short-listed eco-town locations.</p> <p>These documents are available to view here: www.communities.gov.uk/housing/housingsupply/ecotowns/</p>	

BENEFITS	ANNUAL BENEFITS		Description and scale of key monetised benefits by 'main affected groups' The benefits include environmental, economic and social benefits. Households are expected to be the main beneficiaries. A more detailed description of benefits is set out in the evidence section.
	One-off	Yrs	
	£ neg		
	Average Annual Benefit (excluding one-off)		
	£ 10-23m	30	Total Benefit (PV) £300-700m
Other key non-monetised benefits by 'main affected groups' Many of the benefits are likely to vary according to location and specific context, which is not captured in the high level analysis possible for this IA. And only some benefits can be quantified and even then with a high degree of uncertainty. The net benefits are presented as a range, but this only partially reflects the degree of uncertainty. The benefits are likely to be an under-estimate for 2 main reasons: (a) lack of qualitative evidence for many benefits; and (b) the specified assessment period does not capture the benefits that will continue to flow beyond this. Where possible, the evidence base provides a description of the likely nature of these non-monetised benefits and states where and how they are expected to be realised. Eco-towns will provide significant opportunities to support innovation, aid learning, provide research opportunities and enable behaviour change, through their role as public demonstrators of what is possible in green planning, living and development. This, in turn, is aimed to provide wider benefits as the lessons learned from eco-towns are applied more widely in approaches to combating climate change and providing housing.			

Key Assumptions/Sensitivities/Risks The illustrative assumptions are set out in the evidence sections and summarised at the end. All estimates are highly dependent on the assumptions made. At this stage estimates should be treated with caution and are only illustrative. 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.

It should be noted that the PPS: eco-towns does not compel construction of eco-towns, but rather presents them as a development option for consideration through the planning process. It would not be thought likely that any specific eco-town would be brought forward unless it was considered financially viable to do so. A detailed financial viability appraisal has been prepared, with input from external advisers, in relation to the short-listed eco-town locations. This is available to view here: www.communities.gov.uk/housing/housingsupply/ecotowns/

Price Base Year	Time Period Years	Net Benefit Range (NPV)	NET BENEFIT (NPV Best estimate)			
2008	30 years	£-400 to -700m	£-550m			
What is the geographic coverage of the policy/option?		England				
On what date will the policy be implemented?		2009				
Which organisation(s) will enforce the policy?		CLG/LPAs				
What is the total annual cost of enforcement for these organisations?		£ Negligible				
Does enforcement comply with Hampton principles?		Yes				
Will implementation go beyond minimum EU requirements?		Yes				
What is the value of the proposed offsetting measure per year?		£ N/A				
What is the value of changes in greenhouse gas emissions?		£ 50m ¹				
Will the proposal have a significant impact on competition?		No				
Annual cost (£-£) per organisation (excluding one-off)		Micro	Small	Medium	Large	
Are any of these organisations exempt?		N/A	N/A	N/A	N/A	
Impact on Admin Burdens Baseline (2005 Prices)		(Increase – Decrease)				
Increase of £ Nil		Decrease of £ Nil		Net Impact £Nil		
Key:	Annual costs and benefits: Constant Prices		(Net) Present Value			

¹ This estimate only captures carbon savings associated with buildings (and only the additional carbon savings associated with building sooner the very high standards Government is seeking for development more widely). In absolute terms the carbon savings associated with eco-towns, taking into account the whole-site approach to supporting reduced carbon living, will be much greater. See separate annex for further information on the carbon assessment.

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 Supply² 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 2016.³ This was subsequently increased to 240,000 net additions per annum.⁴

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 earnings⁵

(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) report⁶ 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.

² Review of housing supply: Final report – Recommendations, Barker, 2004

³ Government's response to Kate Barker's Review of Housing Supply, ODPM, December 2005

⁴ Homes for the future: more affordable, more sustainable – Housing Green Paper, DCLG, July 2007

⁵ Affordability still matters, NHPAU, July 2008

⁶ 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 Review⁷ 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 Act sets a target for the UK to reduce carbon dioxide emissions by 80 per cent below 1990 levels by 2050.

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

The policy objectives are:

- deliver additional houses in new settlements, to contribute to the Government's ambition for housing growth; and
- to deliver additional housing in new, innovative, highly sustainable developments which are zero carbon.

PPS: eco-towns provides a planning framework for eco-towns⁸. 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 roll-out the best solutions more widely, thereby contributing more significantly to meeting the challenge of climate change and reducing the cost of doing so.

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.

⁷ The Stern Review on the Economics of Climate Change, Stern, 2006

⁸ Published alongside this Impact Assessment, and available to view at: <http://www.communities.gov.uk/housing/housingsupply/ecotowns/>

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.

More recently, the Government's Housing Green Paper⁹ 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.¹⁰ 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 the Government's target that all new homes will be zero carbon from 2016¹¹ and the ambition for all new non-domestic buildings to be zero carbon from 2019.

The Government also recently introduced a new Planning Policy Statement (PPS): Planning and Climate Change. This 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 IA is focused 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.

⁹ Homes for the future: more affordable, more sustainable – Housing Green Paper (DCLG, July 2007)

¹⁰ Climate Change The UK Programme (DEFRA, March 2006) See www.defra.gov.uk/environment/climatechange/uk/ukccp/index.htm

¹¹ Building a Greener Future: final policy statement (CLG, July 2007) see www.communities.gov.uk/publications/planningandbuilding/building-a-greener

D. Analysis of options and evidence base

This IA considers two policy options:

- (1) Small new town settlements – eco-towns
- (2) Small new town settlements – ‘standard’ developments (‘do nothing’ scenario ie no PPS: eco-towns).

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. Building new settlements at this scale bring a number of potential benefits: allowing for provision of a range of services and infrastructure which, when planned appropriately, will improve access and reduce the need for travel beyond the eco-town; realising economies of scale in construction; providing critical mass necessary for introduction of infrastructure for, for example, low-carbon energy production; and promoting and supporting behaviour change on a community and town scale through effective design and spatial planning, and through community engagement and governance.

These are to be delivered through the planning system. PPS: eco-towns, which is the subject of this IA, provides the planning framework to support the delivery of eco-town developments.

The Government’s eco-town 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 schemes potentially starting on site from 2012.

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 240,000 new homes per year by 2016. The costs and benefits of additional housing supply have been set out elsewhere.

The diagram below, which is an extract from the Barker Review of Housing Supply interim report¹², illustrates the welfare implications of increasing housing supply. This IA 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 landowners¹³ (who may also be developers) as developers reduce the price they will pay for land.

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 home. This may be more likely if there are sufficient incentives for buyers associated with on-site renewable technology installations (The Renewable Energy Strategy¹⁴ confirmed that on-site renewable technologies installed to meet carbon compliance requirements would be eligible for feed-in tariffs and renewable heat incentives). However, at some points in the economic cycle, the land value uplift that results from planning permission may not be sufficient to absorb the additional costs. In these circumstances alternative funding models might need to be considered to facilitate development.

Planning permission for new town development is likely to result in considerable planning 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.

¹² Review of Housing Supply – Interim Report, Barker (2003)

¹³ 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.

¹⁴ www.berr.gov.uk/energy/sources/renewables/strategy/page43356.html

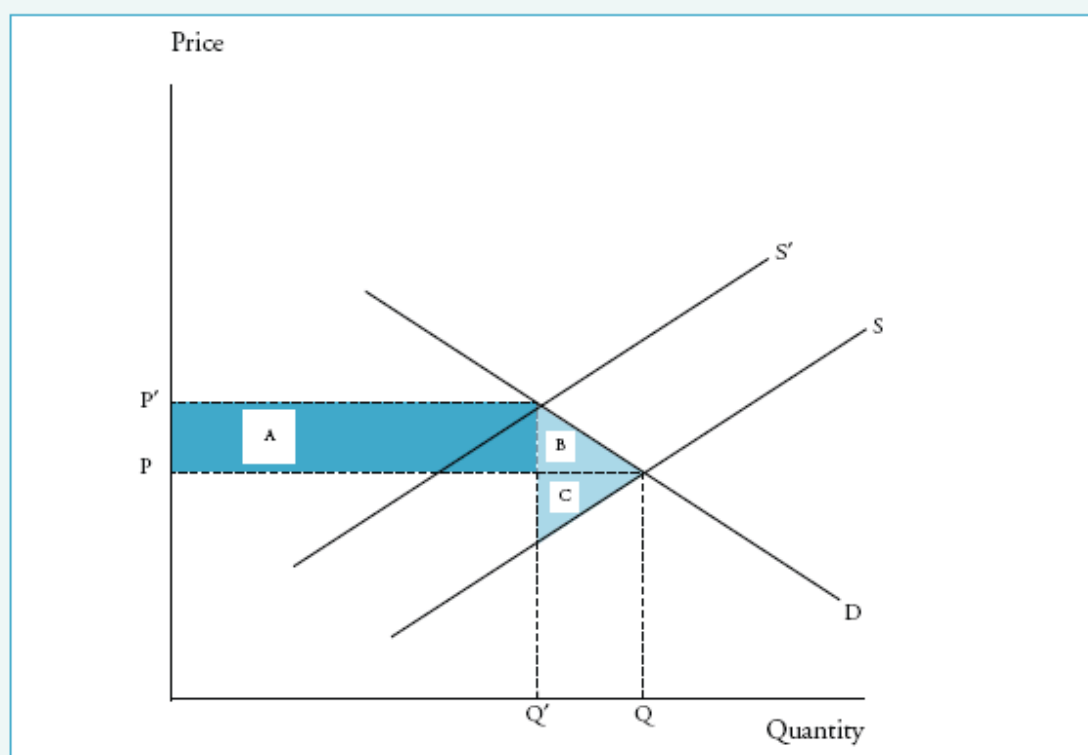
Extract from Barker Review of Housing Supply Interim Report:

Box 1.1 Welfare loss due to housing undersupply⁵

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 the eco-towns programme aimed to bring forward up to ten eco-towns of between 5,000 and 20,000 homes each. The actual number of houses delivered through the programme may also depend on local planning decisions in response to any planning applications that may follow. In addition, publication of an eco-towns PPS means it will be possible for further eco-towns to be proposed for consideration by the local planning system.

For the purposes of estimating the NPV of net benefits, it is assumed that 100,000 homes (and associated infrastructure and services) are delivered over a 30 year assessment period of 2008-2038. This is purely an illustration, and the costs and benefits may be higher or lower depending on the actual level of development as well as the timing of development. Further assumptions used to estimate the NPV are set out at the end of section E.

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). As part of consultation we have welcomed views on the PPS standards and any evidence on the impacts, costs and benefits of these.

This section of the IA should be read in conjunction with the Sustainability Appraisal (SA) of the eco-towns PPS. This incorporates the requirements of the European Strategic Environmental Assessment Directive¹⁵, at a level proportionate to the PPS. The SA and IA have been developed independently of each other (the former 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

¹⁵ 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 PPS, Scott Wilson have also produced an SA of the eco-Towns Programme 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. PPS: eco-towns, which is the subject of this IA, sets out the standards that eco-towns must achieve (in addition to those standards set out in existing planning and other relevant policies). The main standards set out in the 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
- host on a large scale new approaches in green construction and technology, and in doing so bring down construction costs and improve delivery, thereby realising wider benefits for the green construction and technology industries, and those who use their services
- 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 not 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 PPS) are considered for the IA:

- 1 Master planning and transition
- 2 Zero carbon in eco-towns (domestic and non-domestic buildings)
- 3 Transport
- 4 Healthy lifestyles
- 5 Space standards
- 6 Lifetime Homes Standards
- 7 Affordable housing
- 8 Code for Sustainable Homes
- 9 Real time energy monitoring systems and high speed broadband access.
- 10 Employment
- 11 Local services
- 12 Water
- 13 Green infrastructure and biodiversity
- 14 Landscape and historic environment
- 15 Flood risk management
- 16 Waste

1. Master planning and transition

All eco-town planning applications should include an overall 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. The PPS makes clear that in developing the master plan, there should be a high level of engagement and consultation with prospective and neighbouring communities.

Requirements set here include that planning applications for eco-towns should also set out plans for operational delivery of core services to underpin the low levels of carbon emissions, such as public transport infrastructure and services, for when the first residents move in; alongside the detailed timetable for delivery of neighbourhoods, employment and community facilities and services; such as public transport, schools, health and social care services, community centres, public spaces, parks and green spaces.

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 PPS: eco-towns. This implies additional costs to developers (which, assuming the development proceeds, are likely to be passed back to landowners, capitalised in terms of a reduction in land values); the scale of which will be dependent on the specifics and context of the eco-town application.

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 and other public bodies, in terms of time and expertise. The government has said it will consider applications for limited funding from local authorities or other public bodies engaged in helping to deliver the eco-town locations.

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.

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 eco-town 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 illustrative 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, many of the costs and benefits are likely to relate to domestic buildings (housing) and supporting energy infrastructure.

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.

Table 1: Government targets for new housing			
Date	2010	2013	2016
Carbon improvement as compared to Part L of the Building Regulations (Building Regulations 2006)	25%	44%	zero carbon

Source: Building a Greener Future policy statement (Communities and Local Government, July 2007)¹⁷

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, having regard to proposals for standards to be incorporated into changes to the Building Regulations between now and 2016 (including the consultation on planned changes for 2010 issued in June 2009 and future announcements on the definition of zero carbon homes). Homes must also achieve, through a combination of energy efficiency and low and zero carbon energy generation on the site of the housing development and any heat supplied from low and zero carbon heat systems directly connected to the development, carbon reductions (from space heating, ventilation, hot water and fixed lighting) of at least 70 per cent relative to current building regulations (Part L of the Building Regulations 2006).

The analysis below assumes that eco-town housing achieves at least 70 per cent carbon reductions relative to Part L of the Building Regulations from 2010. This means 70 per cent reductions in emissions associated with space heating, ventilation, hot water and fixed lighting (“regulated emissions”). Housing in standard developments is assumed to achieve staged reductions in carbon emissions in line with government policy. All housing, both in eco-town and standard developments is assumed to achieve zero carbon standards from 2016 according to the Government’s definition of zero carbon for homes, to be agreed.

¹⁶ However, the proposed definition of zero-carbon to apply in eco-towns and to be taken forward through regulation from 2016 does not reflect the current definition of zero carbon in the code.

¹⁷ www.communities.gov.uk/publications/planningandbuilding/building-a-greener

Table 2: Carbon reductions relative to Part L of the Building Regulations for new housing, standard development and eco-town development (assumed)¹⁷

Year	Standard development	Eco-town development
2010	25%	70%
2011	25%	70%
2012	25%	70%
2013	44%	70%
2014	44%	70%
2015	44%	70%
2016	Zero carbon	
2025	Zero carbon	

Based on these assumptions table 3 sets out estimates for the cost difference between standard and eco-town development in 2008 prices (£/unit). The estimates have been updated from the consultation IA to take into account more recent evidence. The updated estimates provide a greater range, which reflects the level of uncertainty about the costs involved and the approaches that may be used to achieve carbon reductions.

Table 3: Cost difference between standard and eco-town development in 2008 prices (£/unit)

£/unit	Detached (25%)	End-t/semi (21%)	Mid Terrace (27%)	Flat (27%)	Average unit
Year built					
2010	6200–6400	5500–6500	6000–6800	7700–10600	6800–7200
2011	6200–6400	5500–6500	6000–6800	7700–10600	6800–7200
2012	6200–6400	5500–6500	6000–6800	7700–10600	6800–7200
2013	6200–6400	5500–6500	6000–6800	7700–10600	6800–7200
2014	1800–3400	1100–1300	0–2700	3900–4700	2100–2700
2015	1800–3400	1100–1300	0–2700	3900–4700	2100–2700
2016	0	0	0	0	0
2025	0	0	0	0	0

Based on estimates from “Greenhouse Gas Policy Evaluation and Appraisal in Government Departments”, DECC and the Interdepartmental Analysts Group (2009).

¹⁸ For simplicity it is assumed that developers comply fully with changes in the building regulations and 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.

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 previous assumptions which were used for the consultation IA. (See Cost Analysis of the Code for *Sustainable Homes: Final Report*, Communities and Local Government, 2008)

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 (which are on-going rather than one-off 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 these are likely to be largely 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 (particularly if there are financial incentives to households who live in homes with on-site renewable technologies installed).

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 (NPV) of savings is estimated over a standard 30 year period. The figures have been updated from the consultation IA, reflecting new research and a methodological change in the way savings in carbon emissions are valued. The main change is that carbon emissions associated with electricity use are now valued according to the EU ETS (Emissions Trading System) price of carbon (rather than the shadow price of carbon, which continues to be used for non-traded emissions). There are two scenarios, high and low, which reflect different assumptions about the social cost of carbon by which non-traded emissions are valued.

Table 4a: Net present value of carbon savings (2008-2038) per unit (high scenario), 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	£1,200	£900	£800	£700	£900
2011	£1,200	£900	£800	£700	£900
2012	£1,100	£800	£700	£700	£800
2013	£1,100	£800	£700	£600	£800
2014	£600	£400	£400	£400	£400
2015	£600	£400	£400	£300	£400
2016	£0	£0	£0	£0	£0

Social value of carbon (£/tonne CO₂) reductions is based upon estimates from "Greenhouse Gas Policy Evaluation and Appraisal in Government Departments", DECC and the Interdepartmental Analysts Group (2009).

Table 4b: Net present value of carbon savings (2008-2038) per unit (low scenario), 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	£800	£600	£500	£500	£600
2011	£800	£600	£500	£400	£600
2012	£700	£500	£500	£400	£500
2013	£700	£500	£500	£400	£500
2014	£400	£300	£300	£200	£300
2015	£400	£300	£200	£200	£300
2016	£0	£0	£0	£0	£0

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).¹⁹ 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 EU ETS price or shadow price of carbon (depending on whether emissions in the traded or non-traded sector are being valued).

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

Table 5: Total carbon abatement (relative to base emissions)					
CO₂ tonnes/yr	Detached	End-t/ semi	Mid Terrace	Flat	% reductions from base
Base regulated emissions¹⁹ (total emissions)²⁰	2.27 (3.55)	1.65 (2.77)	1.47 (2.59)	1.31 (2.25)	
	0.57	0.41	0.37	0.33	25
	1.00	0.73	0.65	0.58	44
	1.59	1.15	1.03	0.92	70
	2.27	1.65	1.47	1.31	100

Based on estimates from “Greenhouse Gas Policy Evaluation and Appraisal in Government Departments”, DECC and the Interdepartmental Analysts Group (2009)

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 limited evidence as to the premium that home buyers are willing to pay for green housing). The carbon savings are a social benefit that will contribute to tackling the threat of climate change, whereas fuel savings are private benefits that accrue to the occupant of the home.

²⁰ www.communities.gov.uk/publications/planningandbuilding/codecostanalysis

²¹ 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.

Table 6 sets out estimates of potential fuel savings associated with greater carbon reductions from homes in the eco-towns relative to standard development.

Table 6: Net present value of fuel savings due to reduced energy consumption (2008-2038) per unit (low scenario), 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	£2,900	£2,100	£1,900	£1,700	£2,100
2011	£2,800	£2,000	£1,800	£1,600	£2,000
2012	£2,600	£1,900	£1,700	£1,500	£1,900
2013	£2,500	£1,800	£1,600	£1,500	£1,800
2014	£1,400	£1,000	£900	£800	£1,000
2015	£1,300	£900	£800	£800	£1,000
2016	£0	£0	£0	£0	£0

Based on estimates from “Greenhouse Gas Policy Evaluation and Appraisal in Government Departments”, DECC and the Interdepartmental Analysts Group (2009)

NON-DOMESTIC BUILDINGS

Non – domestic buildings account for around 17 per cent of the UK’s total carbon emissions. There is less available data on the numbers and types of non-domestic buildings than there is for homes. Given the heterogeneity of the non-domestic building stock, a number of assumptions have had to be made in order to quantify costs and benefits for the purposes of this assessment, and should be considered as illustrative only.

This section focuses on commercial buildings and does not include public sector buildings for which the Government has already set a number of carbon reduction targets and these are assumed to apply equally to standard and eco-town developments.

Box 1: Public sector buildings

The government has made it clear that the public sector needs to take a leadership role in reducing its carbon emissions and addressing climate change. A number of carbon reduction targets for the public sector already exist:

- the ambition, announced at Budget 2008, that all new public sector non-domestic buildings would be zero-carbon from 2018
- DECC's 2006 targets for Sustainable Operations of the Government Estate
- DECC have also consulted on the introduction of the Carbon Reduction Commitment, a carbon cap-and-trade scheme, which would apply to central government, large public sector organisations and state schools from 2010
- in the education sector, all new schools must reduce their emissions by 60% in comparison with the 2002 Building Regulations; and with a target for all new schools to be zero carbon by 2016
- in the health sector the NHS has committed to reduce its 2007 carbon footprint by 10% by 2015; and
- at a European level, the Energy Services directive requires energy savings in the public sector in line with indicative national targets

As with domestic buildings, costs and benefits of eco-towns are calculated with respect to standard developments. It is assumed that from 2019 non-domestic buildings, whether in eco-town developments or standard developments, will be built to zero-carbon standard. The 2008 Budget announced the ambition to achieve this and the intention to consult on how the ambition might be met.²² Therefore, costs and benefits for the purposes of this IA 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 current and future consultation. Table 7 lays out an indicative trajectory for carbon reductions assumed for eco-town developments to 2019. This is based on an assumption that eco-towns approach meeting their overall zero-carbon standard through a more rigorous trajectory for non-domestic buildings than required by national standards. These assumptions are only illustrative.

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.

²² www.hm-treasury.gov.uk/budget/budget_08/bud_bud08_speech.cfm

Table 7: Assumptions of carbon reductions used in cost/benefit analysis	
Year	Carbon reductions
	Eco-towns (%)
2010	44
2011	44
2012	44
2013	100
2014	100
2015	100
2016	Zero
2017	Zero
2018	Zero
2019 onwards	Zero

Costs – The costs are calculated using baseline building costs and cost premiums from the UK Green Building Council (UKGBC) report, Report on Carbon Reductions in New Non-Domestic Buildings²³. The baseline building costs are given per square metre, assuming building to meet the standards in the 2006 building regulations. 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.

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. These cost premia should be treated as rough indicative estimates.

It is important to note that the baseline data for these calculations has been derived from UKGBC's 2007 report. The UKGBC report accepted that baseline energy performance data for non-domestic buildings was patchy and subject to considerable uncertainty, especially compared to the domestic sector. This issue is compounded by the diversity of non-domestic stock.

The UKGBC report acknowledged that the document would not provide a comprehensive picture for new non-domestic buildings, but would set out a very useful starting point for further policy development. The report was put together before the Zero Carbon definition consultation document and, although the high level approach is broadly consistent with that of the consultation document, it was unable to reflect some of the approaches addressed in

²³ www.communities.gov.uk/publications/planningandbuilding/carbonreductions

the document. Responses to the December 2008 Zero Carbon definition consultation are currently being analysed, and issues will be explored in greater detail later in 2009.

The UKGBC did acknowledge that there are a number of limitations to the costing methodology undertaken for their project. These limitations included timescale, difficulty in accurately predicting total building energy use and lack of previous cost experience of zero carbon non-domestic buildings.

For instance capital cost estimates do not factor in the cost of fuel for biomass CHP or maintenance costs. There is also no mention of learning rates: a more sophisticated approach using size of domestic and global markets would be desirable for such a complex and varied building stock. The report states that, "considerable work in building a knowledge base which matches cost premiums with building type and building performance will be required to enable a confident and contextually confident assessment to be made".

The UKGBC did not have the opportunity to examine spatial issues more thoroughly, or to look at synergies that may be offered by the build environment for non-domestic buildings. The report states that "planning in the UK is designed to ensure that the local community is developed in a sustainable manner ensuring that the available resources and space are used to its best advantage. The planning system therefore necessarily sets parameters for development to ensure this is the case. Why should this not apply to energy?"

In view of these issues, the following tables can only be viewed as indicative. They are based on the UKGBC report and do not seek to address some of the fundamental limitations of the original analysis. 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.

In addition, the Consultation on the 2010 Review of Part L of the Building Regulations, which was launched on 18 June 2009, is consulting on an 'aggregate' approach for new non-domestic buildings. This approach would achieve the same 25 per cent improvement as a 'flat' approach, but the target would be adjusted for each individual building type to equalise the costs of meeting the standard.

The result is that an overall aggregate reduction can be achieved in a more cost effective manner than a 'flat' approach. The aggregate approach for Part L is still being consulted on and has been developed since the analysis was completed for this IA, so has not been integrated into the analysis presented here. However, future analysis for Ecotowns will take this approach into account depending upon the outcome of the Part L consultation.

Table 8 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 8: Cost of building to higher standards in eco-towns (£/m²)			
Year built	Costs of meeting higher carbon reduction targets £ per m² (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

"Report on carbon reductions in new non-domestic buildings" UK Green Building Council (2007).

These indicative costs, for the purposes of this IA, assume that there will be a strong regulatory push after 2016 at a national level and so the additional costs of higher standards for eco-towns fall after this change. However, as already stated, further consultation will happen separately in advance of any change in regulation for non-domestic buildings.

Benefits – Benefits come from two sources: carbon savings and fuel savings. For illustrative purposes, the assumptions of timings of carbon reductions in eco-towns are as outlined in Table 7.

CARBON SAVINGS

Carbon savings per square metre are measured by calculating the difference in carbon emissions²⁴ 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 the Energy Consumption Guide 19²⁵. Reductions for zero carbon are made to total fuel use. The estimated reductions in carbon emissions are then multiplied by the shadow price of carbon²⁶ (for non traded emissions) or the EU ETS price (for traded emissions) to produce an estimate of the carbon saving. Table 9 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 so there is no difference in carbon savings.

²⁴ 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)

²⁵ www.cibse.org/pdfs/ECG019.pdf

²⁶ www.defra.gov.uk/environment/climatechange/research/carboncost/pdf/HowtouseSPC.pdf

The net present value of carbon savings have been calculated for the period 2008-2038. For buildings constructed later in this period, the benefits will continue to accrue beyond 2038 but these are not included. The figures below are higher than those presented in the consultation stage IA due to a change in methodology in line with new guidance. The main change is that carbon emissions associated with electricity use are now valued according to the EU ETS (Emissions Trading System) price of carbon (rather than the shadow price of carbon).

Table 9: Net present value of carbon savings by building type (2008–2038)

Year built	Carbon savings by building type £ per m ² (2008 prices)		
	Warehouse	Shallow plan	Deep plan
2010	6.56	11.96	16.17
2013	16.98	18.54	24.77
2016	6.64	11.49	17.19

FUEL SAVINGS

Table 10: Net present value of fuel savings by building type

Year built	Fuel savings by building type £ per m ² (2008 prices)		
	Warehouse	Shallow plan	Deep plan
2010	18.3	26.0	25.9
2013	46.5	65.9	65.7
2016	8.8	21.4	24.3

Fuel savings are calculated by assuming total annual fuel costs are reduced by the percentage carbon reduction. This is an illustrative simplification and likely to overstate the savings that are likely to be realized. The difference in fuel costs between non-domestic buildings in eco-towns and in standard developments is calculated and then discounted over a 30 year period. Table 10 shows how these savings vary depending on the year in which the building is constructed.

There are two main changes in the figures from the consultation IA. The estimates now take account of future changes in energy prices, but the period over which the benefits are calculated is now 2008-2038, rather than over the entire building life (which would be beyond 2038 for buildings constructed later in the sample frame).

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, public transport and other sustainable options, 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, and the PPS also requires that homes in eco-towns should have real-time public transport information.

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. As part of the bidding process, promoters of eco-towns proposals to be considered under the eco-towns programme were obliged to carry out a Transport Assessment of their proposals. In any case, promoters are expected to meet the full cost of any new infrastructure needed, as well as for any measures necessary to mitigate the impact of development on strategic national road and rail networks.

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 (although such a scenario may necessitate investment to increase the capacity of existing rail services where this is practicable to accommodate additional trips generated by the eco-town; however, such investment is likely to prove less costly than providing a new rail link). If a site with no existing infrastructure is chosen, then the cost of providing new infrastructure needs to be factored into the final cost. In any case, promoters are expected to meet the full cost of any new infrastructure needed, as well as for any measures necessary to mitigate the impact of development on strategic national road and rail networks.

If sites are chosen with no existing infrastructure, then this will tend to increase 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, driver recruitment and training, and continuing subsidy should therefore be taken into account. Where residents of new developments will be using existing infrastructure, there may be costs associated with increased usage on existing rail routes or local roads. However, we would expect

significantly lower congestion increases (and therefore lower costs) on local roads around eco-towns than for standard developments. The costs of mitigating the potential increased congestion generated by an eco-town will be met by the developer.

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.

The specification that homes should have real-time public transport information will impose extra costs on eco-towns which would not be incurred by a standard development. Detailed information on costs is not available at this time, but costs are expected to be small in the context of overall development costs.

Additional costs associated with the PPS transport standards would be expected to be borne by developers and passed back to landowners, capitalised in terms of reduced land values.

Box 2: Different locations, different costs

The final costs of transport infrastructure improvements are likely to vary between locations, dependent on their size and proximity to nearby centres. At present there is also variation in how specific the outlined plans are.

Example 1: Whitehill-Bordon

This scheme proposes to create an eco-town around the existing community of Whitehill, located on the A325 corridor south of Blackwater Valley, with the addition of 5,500 new homes on land formerly belonging to the MoD training garrison at Bordon. The site is set midway between the A31 and the London/Alton railway line to the north and the A3 and London/Portsmouth railway line to the south. Although both the strategic roads in this area have a modest degree of spare capacity, the eco-town will need to provide efficient and attractive alternatives to car travel to keep increased car traffic at a minimum. One particular challenge will be to devise a strategy to link the eco-town to the rail network, in order to facilitate commuting to London, Portsmouth as well as other destinations within the Blackwater Valley.

The transport strategy for Whitehill Bordon is still in development. However, it is expected that the package will include the installation of a link to the rail network, whether by tram, light/heavy rail or Bus Rapid Transit, as well as the development of an extensive bus network linking destinations across the Blackwater Valley region.

continued overleaf

Box 2: Different locations, different costs (*continued*)

Example 2: Rossington

The proposal consists of a development of 5000 new homes on a former colliery site on the western edge of the existing village of Rossington, to the south of the main town of Doncaster. The site is adjacent to the M18 on the north and bisected by the East Coast mainline to the east.

The M18 around Doncaster already suffers from congestion at peak hours, and the Department must treat any development which would increase traffic on this stretch of network with care. The Highways Agency and Doncaster MBC have been working together with the promoters to understand the implications of the proposal for the local and strategic road networks, and to begin to ascertain the likely options and costs of mitigation. The promoters have also put forward a comprehensive and far-reaching suite of sustainable transport proposals, including a 10 minute bus service into Doncaster.

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 air quality, 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)²⁷. Therefore greater benefits are likely to be gained from reducing car journeys to other urban centres outside the community itself.

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

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 11: Average CO₂ 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. Similarly, eco-town homes having real-time public transport information will enable eco-town residents to make more effective and reliable use of public transport in eco-towns, facilitating access to the wider community. This in turn will support and sustain behaviour change in encouraging people to opt for public transport over private car use.

4. Healthy lifestyles

The PPS: eco-towns seeks to develop healthy and sustainable environments through 'Active Design' principles and healthy living choices. It sees the built and natural environments as an important component in improving the health and well-being of people. These can be achieved through well-designed development and good urban planning which can contribute to promoting and supporting healthier and more active living, as well as reducing health inequalities.

Costs – This standard sets no specific requirements and reflects a broad approach to health in design and planning. Reflecting these needs at the earliest stage of development, at the design and master planning stages, should minimise any additional costs incurred. If additional costs are incurred, it is anticipated that these would be reflected in higher asset values that could be achieved in these new towns, reflecting their high standards. In addition, some of these extra costs may be borne by the developer and passed back to the landowner, capitalised in terms of reduced price paid for the land.

Benefits – The benefits from this standard will flow from the development of healthy and sustainable environments, which will enable residents to make healthy choices from the beginning and to make the most of the opportunities presented by these eco-towns. The detailed work at the planning stage should ensure these environments are delivered from the outset in an efficient, effective and considered fashion. The standards within this PPS should ensure that the eco-town continue to deliver these benefits in the longer-term.

5. Space standards

The PPS requires all new homes to be built to space standards published by English Partnerships (EP), which are now encapsulated in the Homes and Communities Agency's Design Quality Standards. These standards require homes to be built with minimum internal floor areas in relation to bedrooms and occupancy. Building on the legacy of English Partnerships and the Housing Corporation, the Homes and Communities Agency has said it aims to have a harmonised set of core standards in place by 2011. The EP space standards are as follows:

Table 12: 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 2007²⁸

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 space standards (table above) with the minimum standards for social housing originally

²⁸ www.englishpartnerships.co.uk/qualityandinnovationpublications.htm#qualitystandards

developed by the Housing Corporation. These standards were used by BCIS to examine the cost implications of Lifetime Homes Standards (referred to below).²⁹ 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 design of developments to most efficiently accommodate the space requirements.

Ten per cent extra land is estimated to cost an additional £5,568 per average dwelling (10% x 30% x £185,610). Taking into account the possibility of mitigation through design, this figure may be considerably lower. A five 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 flats). Based on the assumed housing mix the weighted average property price is estimated to be £185,610
- value of residential (per unit) land is assumed to be 30 per cent of the house price (2008 prices)

It may be that some houses are being built above or below the Housing Corporation standard, so the actual cost of the PPS: eco-town requirement for housing to meet the space standards could be either higher or lower.³⁰ 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 PPS requirement for space standards.

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 – A number of benefits were set out by English Partnerships as part of the rationale for these 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

²⁹ Pg. 3, “The Cost of Building To The Lifetime Homes Standard” BCIS on behalf of the Housing Corporation (May 2007)

³⁰ A survey of social housing for the BCIS study (2007) found that 34% of units did not exceed HC’s minimum standards.

- 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)³¹

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 which can not easily be quantified.

6. 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.³² 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 Lifetime Homes 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).³³

³¹ www.englishpartnerships.co.uk/qualityandinnovationpublications.htm#qualitystandards

³² "The Cost of Building To The Lifetime Homes Standard" BCIS on behalf of the Housing Corporation (May 2007)

³³ www.communities.gov.uk/documents/housing/pdf/lifetimehomes.pdf

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 the PPS: eco-town requirements for 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

Table 13: 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	£1,600	£1,600	£1,600	£500	£1,300
2011	£1,100	£1,100	£1,100	£400	£900
2012	£1,100	£1,100	£1,100	£400	£900
2013	£1,100	£1,100	£1,100	£400	£900
2014	£1,100	£1,100	£1,100	£400	£900
2015	£1,100	£1,100	£1,100	£400	£900
2016	£1,100	£1,100	£1,100	£400	£900

It should be noted that the above costs are only indicative. BCIS are currently revisiting the estimates of the cost of building to the Lifetime Homes Standards 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 Lifetime Homes 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. These have not been quantified for the purposes of this assessment. 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 Standards

- The cost of residential care is substantially higher than home-based care. Building to the Lifetime Homes Standards reduces, or delays, the need for moves into residential care. Similarly, building to the Lifetime Homes Standards 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

7. Affordable housing

The PPS requires at least 30 per cent affordable housing (which includes social-rented and "intermediate" housing). The PPS also makes clear that eco-towns will be expected to meet any regional or local targets which have been established which are of a higher standard.

Costs – In a number of the short-listed locations development plan policies specify 30 per cent affordable housing or greater so the PPS requirement would not generate additional costs for eco-towns compared to standard developments. Nevertheless, eco-town developments may come forward where the PPS requirement of at least 30 per cent is in excess of local policy and local authority expectations. In these cases the PPS requirement for 30 per cent provision could create additional costs to the developers of eco-towns (compared to developers of standard development). Whether these costs are net additional in the context of the wider economy depends largely on whether the PPS requirement leads to an overall increase in affordable housing delivery compared with standard development.³⁴

³⁴ Changing the distribution (spatially) of a given level of affordable housing delivery may also impact on the cost of delivery (for example, the opportunity cost of affordable housing will be higher in high value locations).

The costs associated with affordable housing within eco-towns (compared to standard development) may be met by some combination of public subsidy, developer contributions and rental receipts.

Developer contributions for affordable housing may be secured by means of planning obligations negotiated in the context of a planning application between a local authority and the developer. The model and cost of delivery may vary on a site-by-site basis. For example, in some cases a developer may contribute serviced land whilst in other cases a developer may build out social units and sell these to an RSL (Registered Social Landlord). The mix of units (social rented versus intermediate shared ownership) and availability of public subsidy will also impact on the costs of delivery.

Table 14: Illustration of local authority affordable housing targets relevant to proposed eco-town locations

Scheme and location	Local authority affordable housing target
Pennbury	Harborough District Council: 30% ³⁴ ; Oadby and Wigston Borough Council: 25%. ³⁵
St Austell	Restormel Borough Council sets out affordable housing targets of 40% for urban areas, 50% for rural areas. They have indicated 50% affordable housing for the eco-town areas. ³⁶
Rossington	Doncaster MBC sets an affordable housing target of 26%. ³⁷
Elsenham	Uttlesford District Council and South Cambs District Council both set affordable housing targets of 40%. ^{38,39}
Rackheath	North Norfolk District Council sets affordable housing targets of 45% in urban areas and 50% in rural/village developments. ⁴⁰ Broadlands District Council sets an affordable housing target of 40%. ⁴¹
Ford	Arun District Council sets a target for affordable housing of 30%. ⁴²

³⁵ www.marketharboroughonline.co.uk/ppimageupload/Image34900.PDF

³⁶ www.planningportal.gov.uk/wps/portal/?PpAction=select_document&select_type_id=120&select_object_id=1070390688988&text_category=&select_loc=

³⁷ www.cornwall.gov.uk/default.aspx?page=17408

³⁸ www.doncaster.gov.uk/Images/PPS%20Document_tcm2-55194.pdf

³⁹ www.uttlesford.gov.uk/localplan/local_plan/written/cpt6.htm

⁴⁰ www.scambs.gov.uk/documents/retrieve.htm?pk_document=905680

⁴¹ [192.168.202.210:9090/progress?pages&id=2851235001&sp2&url=http://www.northnorfolk.org/files/Core_Strategy_\(incorporating_Development_Control_Policies\)_Adopted_2008.pdf&fileName=Core_Strategy_\(incorporating_Development_Control_Policies\)_Adopted_2008.pdf&referer=http://www.northnorfolk.org/ldf/1267.asp&foo=4](http://192.168.202.210:9090/progress?pages&id=2851235001&sp2&url=http://www.northnorfolk.org/files/Core_Strategy_(incorporating_Development_Control_Policies)_Adopted_2008.pdf&fileName=Core_Strategy_(incorporating_Development_Control_Policies)_Adopted_2008.pdf&referer=http://www.northnorfolk.org/ldf/1267.asp&foo=4)

⁴² www.broadland.gov.uk/PDF/1._Affordable_Housing_SPD_Adopted_with_adoption_date_added.pdf

⁴³ www.esrarundc.co.uk/HTML/Statement/statementframeset.html

Table 14: Illustration of local authority affordable housing targets relevant to proposed eco-town locations (*continued*)

Scheme and location	Local authority affordable housing target
Whitehill – Bordon	The Council’s target for affordable housing is currently 35%, and likely to increase to 40% in the new Local Development Framework. ⁴³
Weston Otmoor	Cherwell District council sets affordable housing targets of 20% in Banbury and 15% in Bicester. ⁴⁴
North West Bicester	Cherwell District council sets affordable housing targets of 20% in Banbury and 15% in Bicester. ⁴⁵
Rushcliffe	Rushcliffe Borough council sets an affordable housing target of 30%. ⁴⁶

The costs associated with a higher affordable housing requirement may not be net additional if we assume that the level of social housing delivery overall is unchanged. In other words an eco-town, by delivering a higher level of affordable housing, may displace the need for provision on other sites within a locality. However, whilst the overall level of public subsidy may be fixed, eco-towns may provide an opportunity for additional affordable homes to be delivered by means of planning obligations (private subsidy). The cost associated with these planning obligations would be net additional.

⁴⁴ www.communities.gov.uk/documents/planningandbuilding/pdf/whitehillbordon.pdf

⁴⁵ [www.cherwell-dc.gov.uk/media/pdf/s/s/1._Adopted_Local_Plan_Document_\(Excluding_Plans\)_-_May_08.pdf](http://www.cherwell-dc.gov.uk/media/pdf/s/s/1._Adopted_Local_Plan_Document_(Excluding_Plans)_-_May_08.pdf)

⁴⁶ [www.cherwell-dc.gov.uk/media/pdf/s/s/1._Adopted_Local_Plan_Document_\(Excluding_Plans\)_-_May_08.pdf](http://www.cherwell-dc.gov.uk/media/pdf/s/s/1._Adopted_Local_Plan_Document_(Excluding_Plans)_-_May_08.pdf)

⁴⁷ www.rushcliffe.gov.uk/doc.asp?catid=9908

Illustrative example where affordable housing is delivered by means of planning obligations, with built units sold to an RSL (with and without subsidy). Other assumptions are as follows:

Table 15: Illustrative assumptions			
		Example 1	Example 2
Average house price for private unit, 2008 (the opportunity cost of building an affordable unit)		£185,610	£185,610
Average price paid by RSL per social rented unit completed [1] (without grant)		£60,000	£60,000
Average price paid for shared ownership intermediate unit		£120,000	£120,000
Average social housing grant (SHG) per social unit completed		£55,000	£55,000
Average grant subsidy for shared ownership units		£25,000	£25,000
Proportions of affordable housing that are social rented and shared ownership	Social rented%	70%	30%
	Shared ownership%	30%	70%
Average revenue per house foregone i.e. opportunity cost for additional per unit affordable housing requirement			
With subsidy		£69,000	£67,000
Without subsidy (SHG)		£108,000	£84,000

In the examples set out above, every additional affordable unit costs the developer £67,000-£108,000 depending on (a) the level of subsidy and (b) the proportion of affordable housing that is social rented versus the proportion that is shared ownership. The cost for this particular developer could be reduced if the scheme could attract additional subsidy and/or if the local planning authority accepted a lower proportion of social rented units. However, this impact would only be distributional for a given level of public subsidy and overall level (and mix) of affordable housing delivery. At the wider economy level, the cost could be between zero and £108,000 (based on the assumptions above).

Based on a scheme of 10,000 units, an increase in the affordable housing requirement from 25 per cent to 30 per cent would mean an additional 500 affordable units. Based on the above assumptions, the opportunity cost for the developer would be between £33.5m and £54m depending on (a) the level of subsidy and (b) the proportion of affordable housing that is social rented versus the proportion that is shared ownership. At the wider economy level, the net cost could be between £0m and £54m depending on the degree to which any increase in the supply of affordable housing is net additional.

Any additional costs associated with higher affordable housing requirements is likely to be borne by landowners, with the lower planning use value capitalised in a lower price paid for land by developers.

Benefits – Benefits depend on the assumption made about whether eco-towns would produce a higher overall level of affordable housing. If there is no net increase in affordable housing supply, the PPS requirement would only have a distributional impact in terms of the location of affordable homes within a locality. If we assume that all the benefits are linked to the homes themselves, then there would be no net benefit. However, the benefits associated with a home also depend on location, so new affordable homes delivered as part of eco-towns has the potential to produce net benefits.

“If affordable housing is provided in the right areas, people’s life chances can be improved. This can particularly be the case through increasing the opportunities for employment. The location of the affordable housing may also alter attitudes to work; there is evidence from Department for Work and Pensions (DWP) studies that people take decisions to apply for incapacity benefit, for example, on the basis of their partner’s decision, implying peer pressure to behave in certain ways (Ashworth et al, 2001).”⁴⁸

In terms of benefits at the economy level due to any net increase in affordable housing supply, this depends on the level of additional affordable housing and the benefit per unit. Many of the benefits are hard to quantify. The table below lists a number of qualitative impacts associated with additional affordable housing. An additional benefit not mentioned in this table is the potential savings to Government in terms of housing those in need. Additional affordable housing means additional households can be taken out of temporary accommodation and the PRS, which may be more expensive in terms of Housing Benefit subsidy.

The table below shows the qualitative impacts associated with additional affordable housing supply.⁴⁹

Table 16: qualitative impacts associated with additional affordable housing supply		
Impacts	Scale and direction (+ve/-ve)	Importance
Support of local employment strategies by housing key workers supplying local labour.	Potentially large +ve	High
The housing of low income and special needs groups may enable individual tenants to make greater contributions to economic and social life.	Correlated to the proportion of affordable housing +ve	High

⁴⁸ “A sustainability impact study of additional housing scenarios in England” CLG, 2005 (a report produced for CLG by a consortium led by Entec) www.communities.gov.uk/documents/housing/pdf/142736.pdf

⁴⁹ Pg. 131 “A sustainability impact study of additional housing scenarios in England” CLG, 2005 (a report produced for CLG by a consortium led by Entec) www.communities.gov.uk/documents/housing/pdf/142736.pdf

Table 16: qualitative impacts associated with additional affordable housing supply (continued)

Impacts	Scale and direction (+ve/-ve)	Importance
Targeted investment by RSLs can promote training and employment, encourage enterprise and reinvigorate community life.	Small to medium. Potentially could be larger +ve	Medium
Partnerships with residents, local authorities and voluntary groups have the potential to expand access to public and private funding sources and to co-ordinate strategies.	Small to medium. Potentially could be larger +ve.	Medium
Concentrating new affordable housing in growth areas may not be successful if households do not wish to move there, so that housing pressures worsen in non-growth areas.	Medium to large -ve	Medium to high

8. Code for Sustainable Homes

PPS: eco-towns requires that homes in eco-towns should achieve Level 4 of the Code for Sustainable Homes at a minimum unless higher standards are set elsewhere in the PPS. The Code for Sustainable Homes provides a single national standard to guide industry in the design and construction of sustainable new homes. It measures the sustainability of a home against nine different categories: energy; water; waste; materials; surface water run-off; pollution; ecology; health and wellbeing; and management.

Depending on the level of performance achieved in each area, a number of points are awarded. These are then added up to give the Code level, from 1 to 6, with 6 being the highest. For energy and water there are mandatory minimum requirements. There is no requirement on standard developments to reach specific levels of the Code, although all new Government funding for homes built by registered social landlords (e.g. via the Homes and Communities Agency) have a condition that they comply with level 3 of the Code for Sustainable Homes, and all new service housing contracted by the Ministry of Defence is required to meet this level.

Costs – PPS: eco-towns requires higher standards than Code level 4 for domestic energy efficiency, and higher standards for domestic water use under some circumstances. The costs and benefits of these are considered elsewhere in this IA. The requirements of the PPS applying to waste, flood risk management, green infrastructure, Lifetime Homes, local services, development and management will be of relevance to the approach taken to achieving Code requirements in eco-town houses and may potentially lead to delivery of homes achieving in excess of Code level 4 overall. Costs and benefits of these standards are considered elsewhere in this IA.

Any additional costs incurred by application of the Code would be expected to be marginal in the context of the wider development. Any such costs would be likely to be borne largely by landowners, with the lower planning use value capitalised in a lower price paid for land by developers (though buyers may be willing to pay some premium for some features).

Benefits – Building to this level of the Code will ensure clarity and consistency of expectation on homes standards for eco-town homes. It will ensure quality across a wide range of areas and ensure high minimum standards for homes. Given the stretching nature of Code level 4, and in context of the broader requirements of PPS: eco-towns which will be of relevance to eco-town homes, and there should also be benefits from the wider learning accruing from construction to this standard on a large scale.

9. Real time energy monitoring systems and high speed broadband access

PPS: eco-towns requires that new homes in eco-towns should have real time energy monitoring systems; real time public transport information and high speed broadband access, including next generation broadband where possible. Costs and benefits of real time energy monitoring systems and high speed broadband access are considered below; those of real time public transport information are considered in the section on transport.

Access to Broadband

The PPS requires that eco-town homes have access to high speed broadband access, including next generation broadband where possible.

Costs – Standard developments are not currently required to provide broadband services to new homes. However, under the Government’s announcement of nationwide provision of broadband access to a speed of 2Mbps by 2012, as part of a Universal Service Commitment, the underlying infrastructure for broadband connection, namely connection to a telecommunications network, would be expected to be a feature of standard development.⁵⁰ This however should be seen as a floor, and not a ceiling and the provision of Next Generation broadband should be desirable where possible.

To facilitate this, the Government will be producing a Publicly Available Specification for connectivity in New Build homes, along with the British Standards Institution, to provide guidance for house builders.

“It is increasingly common for property developers to wish to build fibre access to new premises from the start in order to provide telecommunications services [...] These projects are often undertaken by a wide range of organisations that may not normally be considered as communications service or network providers.” OFCOM 2006

⁵⁰ www.ofcom.org.uk/telecoms/ioi/orp/fibreaccess/fibreaccessguidance.pdf

Potential for any increased costs for provision of next-generation broadband access can be broken down into any additional capital costs for installing the fibre-optic cabling required for Next-Generation Access (NGA) broadband (over and above the costs of installing standard, copper wire-based, cabling), and any additional costs to the householder to receive the service.

Capital costs of installation

Next Generation Access and super-fast broadband are still in the very early stages of being rolled-out across the country, and a detailed evidence base as to costs is not available at this time. It is unclear whether laying fibre optic cables instead of copper wire increases capital costs; anecdotally, the cost of installing fibre optic may even be cheaper than copper. However, there are other factors that may play a role, such as availability of service provision, and the cost of connecting to the network. Any potential for increased costs would be expected to be small in the context of overall development costs, and would be expected to be borne by the developer and passed back to the landowner in the form of reduced prices paid for land.

Costs to households

With NGA provided to eco-town homes, individual households can then choose to connect to broadband service by entering into a contract with a service provider. Typically, service providers offer free connection to the network, but the household pays a subscription fee for internet access.

The only additional direct cost to consumers from NGA provision in eco-towns would be if the subscription fee for next generation broadband is higher than for standard broadband. Given the current early stage in rollout of next-generation broadband, evidence for subscription costs is very limited. It is likely to be the case that subscription costs for next generation broadband will, at least initially, be higher than for standards broadband, though this differential is likely to fall over time as the technology becomes established and efficiencies increase.

However, it would also be expected that next-generation broadband subscriptions would continue to include a pricing point equivalent to the current subscription costs of standard broadband access, in return for offering a service with performance comparable to standard broadband access. This would make any increased subscription costs for NGA optional for the householder.

Benefits – It is extremely difficult to assess the size of the potential benefits which may be generated by NGA. Next Generation Access and super-fast broadband are still in the very early stages of being rolled-out across the country, and its full effects are not going to be known for some considerable time. It is also still very much unknown as to what new and innovative applications and services super-fast broadband is likely to support; consumer demand for such services; and the precise amount businesses and households would be willing to pay for them.

Furthermore, the benefits may depend on the technology solution used to deliver NGA. As a result, there is considerable uncertainty as to the size of the potential benefits achievable from next generation broadband. However, there are a number of areas where next-generation access may be expected to bring benefits over and above those of standard broadband access:

Tele-working

NGA-supported services such as two-way video conferencing may encourage more employees and employers to make greater use of tele-working whereby some employees work from home where they can be more productive. This can deliver benefits both to the firm, the employee as well as wider economic, social and environmental benefits. For example tele-working can:

- help reduce the barriers to entering the labour force for those groups which may be less mobile (e.g. disabled and parents with child-care responsibilities who wish to work part-time)
- potentially contribute to the reduction in traffic congestion and carbon emissions; and
- improve work-life balance.

Improved delivery of public services (education and health care)

NGA can help improve the quality and delivery of education services to people in more rural and remote areas, helping them become more skilled, productive and earn a higher wage. Australia is an excellent illustrative example of where this is happening. According to DCITA⁵¹, higher-speed broadband access has led to the creation of virtual classrooms which help to deliver a better quality of service and enables teachers to engage with students as a group through video conferencing.

NGA can also play an important role in improving the quality and delivery of healthcare services. As Table 2 below shows, NGA has the potential to deliver higher-quality versions of existing health care technologies and services as well as enabling delivery of new services which cannot be supported using current generation broadband networks.

⁵¹ DCITA (2007) The economic effects of broadband: an Australian perspective. This paper can be accessed at: www.oecd.org/dataoecd/29/9/38698062.pdf

Table 17: Delivery of care and education services and technologies at different broadband speeds

Domain/service	technology	Service		
		Individual/ 10Mbps	Small institution /100Mbps	Large institution /1Gbps
Care Services				
High quality non-real-time video-imaging for diagnosis	File transfer	High quality	High quality	High quality
Cardiology, neurology and emergency room consultations	H.323 video	High quality	High quality	High quality
Cineo-angiography and echocardiograms	H.323 video	High quality	High quality	High quality
3D interactive brain imaging	SGI Vizserver	Unsupportable	Medium quality	High quality
Clinical decision-support systems	Web browsing	High quality	High quality	High quality
Advanced decision support systems	Image transfer		High quality	High quality
Home monitoring	Telemetry	Medium quality always on		
Home tele-visits	h.323 video	Medium quality		
Public health information	Web browsing	High quality		
Teaching and learning services				
Professional tele-education	MPEG 1 video	High quality	High quality	High quality
Effective learning	Multimedia			
Browsing	High quality	High quality	High quality	
Comprehensive learning environment	h.323 video conferencing T.120 applications Sharing	Medium quality	High quality	High quality

Source: OECD Information Technology Outlook, 2004

According to the DCITA (2007), whilst some health care services can be delivered using small amounts of bandwidth (e-psychiatry, e-ultra-sound and e-radiology) the number of services using increased bandwidths is rising because it offers the prospect of clearer pictures, smoother motion and better synchronicity of sound with images through broadband. This suggests that the quality of healthcare service can be significantly improved for people who cannot easily access health care services such as the elderly or people living in remote areas.

Social and environmental benefits

According to Plum (2008), NGA supported services may help deliver further progress towards the achievement of social objectives such as increased democratic participation, cultural understanding and social inclusion. Furthermore, NGA-supported services may make a more powerful contribution to environmental objectives such as carbon abatement and reduced energy consumption⁵².

Real time energy monitoring

Smart meters perform the traditional meter function of measuring energy consumption, but they also offer a range of advanced functions, such as allowing energy suppliers to communicate directly with their customers, removing the need for meter readings and ensuring accurate bills with no estimates. Consumption information can be provided to domestic customers through an integrated, in-home display.⁵³

In 2008 the Government announced that it intends to mandate smart meters for all households, with an indicative timetable for completion by end-2020.⁵⁴ The Government recently issued a consultation on its proposals.

For non-domestic metering, the Government recently put in place new rules for metering at larger non-domestic gas and electricity sites. New license modifications taking effect from 6 April 2009 will require the installation of advanced metering at such sites by April 2014.

Advanced metering is also already being quite widely installed in the small and medium business and public sector. This trend will be accelerated by the Carbon Reduction Commitment, which will have effect from April 2010 and will incentivise the early installation of advance metering, and initiatives such as the Office of Government Commerce's promotion of advance metering within the public sector.

⁵² Climate Risk Pty Ltd (2007) *Towards a high bandwidth, low-carbon future*. This report can be accessed at: www.climaterisk.com.au/Climate%20Risk%20Telstra_report.pdf

⁵³ http://decc.gov.uk/en/content/cms/what_we_do/consumers/smart_meters/smart_meters.aspx

⁵⁴ House of Lords Hansard, 28 October 2008, Column 1516

In July 2008 the Government published a consultation on advanced and smart metering in the small and medium non-domestic sector. The Government now proposes to extend to this sector the minimum functionality that will be required for smart meters in the domestic sector to an indicative timetable of 2020.

Costs – The detail of Government policy on smart metering is still uncertain but the direction of travel is clear. If the Government sets hard targets for utility companies to roll out smart meters by 2020, then utility companies will install smart meters in all new properties. In this case, the PPS: eco-town requirement does not create an additional cost burden; rather it reinforces Government policy.

However, whilst the details of Government policy are still to be determined, the PPS: eco-towns may bring forward the installation of smart meters in new homes. In standard developments, the default option would be to install standard meters apart from the 20–30 per cent of the market where a commercial case exists to install smart meters.

The table below summarises estimated costs and benefits per meter. We assume one gas and one electricity meter per dwelling with a single display. Communications infrastructure is not included within these costs. The range (high, low) reflects different levels of functionality.

Table 18: estimated costs and benefits per meter					
Gas			Base asset cost (£)	Additional cost per meter (£, relative to basic meter)	Annual benefit attributed to smart meter functionality (£, relative to basic meter)
Basic Meter			£18.00		No smart meter benefits
Smart Meter	Functionality	Low	£33.60	£15.60	£16.0
		High	£56.00	£38.00	£22.5
Electric					
Basic Meter			£10.00		No smart meter benefits
Smart Meter (including display)	Functionality	Low	£42.00	£32.00	£14.0
		High	£58.00	£48.00	£20.1

Table 18: estimated costs and benefits per meter (continued)					
Gas			Base asset cost (£)	Additional cost per meter (£, relative to basic meter)	Annual benefit attributed to smart meter functionality (£, relative to basic meter)
Total					No smart meter benefits
Basic Meter			£28.00		
Smart meter (including display)	Functionality	Low	£75.60	£47.60	£30.00
		High	£114.00	£86.00	£42.60

Source: IA of GB-wide smart meter roll out for the domestic sector⁵⁵

These are capital costs only and do not include operating and maintenance costs or the cost of capital.

The average capital cost per eco-town dwelling will be lower if we take into account the 20-30 per cent of the market where a commercial case exists to install smart meters (such that the costs and benefits would be common to both eco-towns and standard developments). The average capital cost per dwelling is likely to fall over time due to technological advancement. This has been the experience with current meters and has also been seen in the international deployments of smart meters. Finally, Government policy (as discussed above) may lead to a comprehensive roll-out of smart meters more generally (over the 30 year assessment period for this IA) such that the additional costs (and benefits) of eco-town development relative to standard development would fall to zero.

It is expected that the costs would be borne by a combination of landowners, energy suppliers and households.

Benefits – There are benefits to both consumers and suppliers and different benefits are attributable to different levels of functionality (see table above).

Benefits from smart meters can be driven by changes in consumers' expected consumption behaviour. Two potential sources of change in average consumption behaviour may arise:

- reduction in overall energy consumption as a result of better information on costs and use of energy which drives behavioural change, and
- shift of energy demand from peak times to off-peak times

⁵⁵ www.decc.gov.uk/en/content/cms/consultations/smartmetering/smartmetering.aspx

The main supplier benefits are:

- avoided meter readings
- reductions in customer service overheads
- avoided site visits; and
- sale of new energy products

A more comprehensive list and description of benefits can be found in the IA for the GB-wide smart meter roll out for the domestic sector.⁵⁶

10. 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.

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).

⁵⁶ www.decc.gov.uk/en/content/cms/consultations/smartmetering/smartmetering.aspx

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 19: Estimate of jobs requirement per house			
(1)	Occupancy (people/house)	2.98 (consistent with earlier assumptions) ⁵⁶	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)⁵⁸

National Statistics (employment and population figures)⁵⁹

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.

Table 20: 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	0.3	25%	0.0022	£4,540

* 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)⁶⁰

** 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.

⁵⁷ 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

⁵⁸ www.communities.gov.uk/documents/housing/pdf/920785.pdf

⁵⁹ www.statistics.gov.uk/StatBase/Product.asp?vlnk=1944

⁶⁰ www.southeast-ra.gov.uk/planning_miltonkeynes2.html

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. 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.⁶¹ These values should be regarded as illustrative.

Table 21: 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 £4,540 per unit. Based on the range of typical land values reported above, the private benefit could be of the order of £1,900 to £3,500.

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.

11. Local services

PPS: eco-towns lays out a requirement that planning applications for eco-town should include a good level of provision of services within the eco-town, that is proportionate to the size of the development. It states that these should include leisure, health and social care, education, retail, arts and culture, library services, sport and play facilities and community and voluntary sector facilities.

⁶¹ www.voa.gov.uk/publications/property_market_report/pmr-Jul-08/industrial_land.htm#class_b1_land

Costs – Costs will vary according to the location, size and makeup of developments, and to local needs; the standard is designed to be flexible to these. To a large extent these costs will not be additional to eco-towns, as many elements of local services would equally be required in a standard (ie non-eco town) development of similar scale; whilst other elements (e.g. retail) would likely be attracted to large-scale development. Where costs are additional, it is expected that these would be borne by the eco-town developer and passed back to the landowner in the form of reduced land costs.

Planning-in local services from the beginning, as part of strategic masterplanning, should enable efficiencies to be realized in delivering co-ordinated and integrated services. These opportunities would be available to a non-eco-town development; however, the local services standard of the eco-town PPS, alongside its further requirements with regard to masterplanning, development and transition, should maximize the realisation of these efficiencies by ensuring these are planned and delivered in a joined-up fashion, and reflect local circumstances.

Benefits – The aim of creating vibrant and sustainable communities in eco-towns requires a range of supporting factors, and appropriate provision of local services is key to this. The local services standard in the PPS ensures that delivery and maintenance of an appropriate types and levels of provision of a comprehensive range of local services is considered carefully at the early stage of development, in the context of wider masterplanning, and planned and delivered in a coherent manner to support eco-town communities from the beginning of occupancy. This is supported by the requirements in PPS: Eco-towns that eco-town planning applications should set out the detailed timetable of delivery of neighbourhoods, employment and community facilities and services, and demonstrate a high level of engagement and consultation with prospective and neighbouring communities.

This in turn supports the development and sustainability of eco-towns as viable and flourishing communities, enhances accessibility of services and reduces the necessity for travel beyond the eco-town to access services. This is also consistent with, and supports, the eco-town transport standard, that the provision of services within the eco-town may be co-located to reduce the need for individuals to travel by private car.

12. 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, and should contribute, where existing water quality leaves scope for further improvement, towards improving water quality in their localities.

Eco-towns in areas of serious water stress should aspire to water neutrality, ie achieving development without increasing overall water use across a wider area. New homes in eco-towns should be equipped to meet the water consumption requirement of level 5 of the Code for Sustainable Homes, and new non-domestic buildings will be equipped to meet similar high standards of water efficiency with respect to their domestic water use.

Costs – The costs are likely to vary depending on location; e.g. areas of serious 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 additional measures to reduce demand from existing households to offset the demand generated by the new development. This may include retrofitting existing buildings to improve their water efficiency.

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

Detached (25%)	End-terrace/semi (21%)	Mid-terrace (27%)	Flat (27%)	Average unit
£2,600	£2,600	£2,600	£800	£2,100

Based on estimates in Cost Analysis of the Code for Sustainable Homes: Final Report, Communities and Local Government, 2008⁶²

Benefits – The main benefits will arise from financial savings for households through reduced water bills, and a reduction in energy used for water processing if water consumption is reduced. There are also benefits to water companies in avoiding costs of supplying additional water. If a standard development meets the standards proposed in future building regulations which are equivalent to Code Level 1 and 2, typical water consumption is estimated at 120 litres per person per day. Building homes to Code Level 5 and 6 would result in typical water consumption estimated at 80 litres per person per day. This represents an estimated reduction in water consumption of a third, or 40 litres per person per day. Taking an average household size of 2.3⁶³ and assuming a saving of 1p for every 10 litres saved⁶⁴, this gives an average household saving of £34.16 per year.

⁶² www.communities.gov.uk/publications/planningandbuilding/codecostanalysis

⁶³ The 2002 General Household Survey

⁶⁴ Water UK www.water.org.uk/home/resources-and-links/waterfacts/waterprices

As an energy-intensive industry the water industry is responsible for approximately 4 million tonnes of greenhouse gas emissions (CO₂ equivalent) every year.⁶⁵ 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 mitigated to a degree under the eco-towns option where water is being used more efficiently, particularly 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.

13. 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. The eco-towns PPS requires that eco-towns should demonstrate a net gain in local biodiversity, and planning permission should not be granted for eco-town proposals which have a significant adverse effect on internationally designated nature conservation site or Sites of Special Scientific Interest.

Green space and provision for biodiversity can have a positive impact on the health of individuals through healthier lifestyles and better quality of life. 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 – Whilst land used for green space and biodiversity may be a resource for a range of other uses (eg recreation, education, or Sustainable Urban Drainage), it will not be available for other uses such as housing or industry. This is an opportunity cost. There will be costs associated with the design of the town, and revenue costs associated with maintenance of Green Infrastructure. It will be important that the design provides for the 40 per cent green space to be integrated 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.

⁶⁵ Water UK (www.water.org.uk/home/policy/climate-change/briefing-paper)

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 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.

Benefits – There are economic, social, educational, health, recreation and quality-of-life benefits from providing green infrastructure and taking account of biodiversity in eco-towns. Good green infrastructure has a number of other benefits including improved biodiversity, reduced flooding and, in urban areas in particular, it is an important factor in reducing the impact of urban heat islands and helping to cool areas during heatwaves. Green infrastructure therefore has potential multiple roles in helping places to adapt to a number of the likely key impacts of climate change whilst increasing quality of life and the attractiveness of a place for living and setting up business.

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.⁶⁶ 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.

⁶⁶ *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

Wetlands can also provide a natural flood defence. The value of this service has been estimated at £1,279 per hectare per year (Efttec, 2005).⁶⁷

Direct economic benefits also flow from a high quality environment, perhaps most obviously from activities such as tourism (tourism in the English countryside is worth around £14bn per annum). However, small businesses choosing a new business location rank open space, parks and recreation as a number-one priority and there is a growing body of evidence that green space and green infrastructure can improve the value of property, both business and residential, and help to attract and retain businesses and stimulate business growth and investment. UK Trade and Investment, the UK Government's investment and business development agency, highlights the natural environment as a key quality of life factor for businesses and entrepreneurs who are considering investing in the UK.

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.⁶⁸

Table 23: estimated values society places on different types of land		
Land type	Present benefit (per hectare per year, 2001)	Net present value of future benefits⁶⁸
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. (nb. These values were assessed using contingent evaluation 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.)

⁶⁷ England's Eco-systems Services (Efttec, 2005 for English Nature) www.eftec.co.uk/eftec_reports/eftec-Englands_Ecosystems-128.pdf

⁶⁸ www.hm-treasury.gov.uk/media/7/B/barker%20_review_foretoch3_396.pdf (pg.36)

⁶⁹ This is the value today of 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).

14. Landscape and historic environment

PPS: eco-towns states that planning applications for eco-towns should demonstrate that they have adequately considered the implications for the local landscape and historic environment; that this evidence, in particular that gained from landscape character assessments and historic landscape characterisation, should be used to ensure that development complements and enhances the existing landscape character. Furthermore, the PPS states that evidence contained in relevant Historic Environment Records should be used to assess the extent, significance and condition of known heritage assets (and the potential for the discovery of as yet unknown heritage assets), and the contribution that these may make to the eco-town and surrounding area; and that eco-town proposals should set out measures to conserve and, where appropriate, enhance heritage assets and their settings through the proposed development.

Costs – This standard does not in itself impose higher regulatory standards than would otherwise apply to an equivalent standard development. As such, it would not be expected to incur additional costs.

Benefits – While not setting higher standards than would otherwise be applied to a new development, this standard highlights the significance of landscape and the historic environment to successful large-scale development, and the importance of careful consideration of local landscape and historic environment in developing plans for eco-towns. This will help to ensure that implications for, and benefits of, landscape and the historic environment are considered early and in a strategic fashion as an integral part of planning and design, and that full use is made of opportunities both to minimise and mitigate impacts and to gain greatest public benefit from the development in terms of the local landscape and historic environment.

15. Flood risk management

The eco-town PPS says that the location, layout and construction of eco-towns should reduce and avoid flood risk where practicable. Eco-towns should not increase the risk of flooding elsewhere and should use opportunities to address and reduce existing flooding problems.

The PPS presents a strong expectation that all of the built-up areas of an eco-town (including housing, other public buildings and infrastructure) will be fully within Flood Zone 1 – the lowest risk. It continues that Flood Zone 2 (medium risk) should, as far as possible, be used for open spaces and informal recreational areas that can serve as multi-functional spaces, for example, those used for flood storage.

The PPS says that there should be no built-up development in Flood Zone 3, with the exception of water-compatible development and, where absolutely necessary, essential infrastructure as defined in table D.2 of PPS25: Development and Flood Risk.

Costs – Additional costs, as against building to existing planning policy on development and flooding, will be dependent on the circumstances and layout of a proposed eco-town scheme. An eco-town developed in an area of low flood risk would face no additional costs. An eco-town developed in an area which contained elements of medium or high flood risk might minimise additional costs through responding strategically to the requirements of the eco-town flooding standards at the masterplanning stage. In circumstances where this was not possible without substantive opportunity costs, those costs would be incurred. Such costs are expected to vary significantly on a site-by-site basis. It is also expected that any such costs would be largely borne by the developer and passed back to the landowner, capitalised in terms of reduced land values.

Benefits – Existing Government planning policy through PPS25 provides a strong policy framework for flood risk to be taken into account in the planning process to prioritise non-flood risk areas for development wherever possible, and to direct the most vulnerable forms of development to areas of lowest flood risk. Sir Michael Pitt's report on the lessons learned from the 2007 floods, published in June 2008, supports PPS25 planning policy and recommends that it should be rigorously applied by local planning authorities.

Against this backdrop, the eco-town PPS takes the policy approach in PPS25 further, placing a more stringent emphasis of the sort of development that might be considered appropriate in medium (Zone 2) and high (Zone 3) flood risk areas. This ensures that eco-towns are developed so that the type of development proposed within the eco-town has been rigorously assessed against the risk of flooding, and which in turn enables a better adaptation to a changing climate.

16. Waste

Eco-town planning applications will need to include a sustainable waste and resources plan, covering both domestic and non-domestic waste, which sets targets substantially more ambitious than current national or local targets (whichever are more stringent), and demonstrates how these targets will be achieved, monitored and maintained. 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 per cent) 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.

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 Construction, Demolition and Excavation (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 and designing out the sources of waste in manufacturing, transport and construction processes. 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. The Waste and Resources Action Programme (WRAP) has estimated a net saving potential of £71,000 on a 100 dwelling construction project by reducing waste to landfill and recovering more waste 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.

Summary of PPS: eco-towns standards and assumptions used to estimate the present value of total costs and total benefits

General assumptions

Build profile

This IA assumes 100,000 new houses (with associated infrastructure) are constructed over a 20-year period, with the first units being constructed in 2013. The profile for new completions is assumed to be flat, with 5,000 units per annum (this is a simplifying assumption and does not take account of housing market dynamics, which are highly uncertain). The table below summarises the main cost and benefit assumptions. Per dwelling costs and benefits by year are multiplied by the assumed number of units by year, then totalled (after discounting).

Discount rate

All costs and benefits are estimated at 2008 prices, with future costs and benefits discounted at a standard 3.5 per cent rate. All costs and benefits are estimated for a standard 30 year period (2009-2038). This will tend to underplay many of the benefits, which will continue to accrue beyond this time frame (costs are generally one off, whilst benefits flow over many years).

Table 24: PPS standards and key assumptions for present value calculations

PPS standards	Key assumptions for present value calculations
Master-planning and transition	Not included in calculations as not quantified.
Zero carbon in eco-towns	
Domestic	<p><u>Costs</u> – a range of illustrative average unit (per dwelling) costs by year of construction are set out in table 3.</p> <p><u>Benefits</u> – average unit benefits include fuel savings and carbon savings (set out in tables 4a, 4b and 6 by year). There is no range for fuel savings whereas the range for carbon savings reflects different carbon price assumptions.</p>

Table 24: PPS standards and key assumptions for present value calculations (continued)

PPS standards	Key assumptions for present value calculations
Non-domestic	<p><u>Costs</u> – illustrative costs per m² by type of building and by year of construction are set out in table 8. Based on an assumed provision of employment land per dwelling* and assuming a simple average of building types, these are translated into a cost per dwelling. There is no range for costs.</p> <p>* The section on employment provides details.</p> <p><u>Benefits</u> – benefits include fuel savings and carbon savings. Benefits per m² by type of building and by year of construction are set out in tables 9 and 10. Based on an assumed provision of employment land per dwelling* and assuming a simple average of building types, benefits per m² are translated into an average cost per dwelling.</p> <p>As with domestic buildings there is a range of benefits reflecting different assumptions about the price of carbon (there is no range for fuel savings).</p>
Transport	Not included in calculations as not quantified.
Healthy lifestyles	Not included in calculations as not quantified.
Space standards	<p><u>Costs</u> – illustrative average unit (per dwelling) costs by year of construction are set out in section 5. Range £2,784-5,568.</p> <p><u>Benefits</u> – there is no evidence to help quantify benefits, but it is likely that households would be willing to pay some premium for additional space. We therefore assume that the benefits may be up to half the costs. This produces an illustrative range £0-2,784.</p>
Lifetime Homes Standards	<p><u>Costs</u> – illustrative average unit (per dwelling) costs by year of construction are set out in table 13.</p> <p><u>Benefits</u> – Not included in calculations as not quantified.</p>
Affordable housing	<p><u>Costs</u> – illustrative average unit (per dwelling) costs are based on the example set out in section 7. The illustrative cost range is £0-5,400 per dwelling built. The low end reflects the case where eco-towns deliver no net additional affordable homes. The upper end is the cost (without subsidy) associated with a 5 percentage point increase in affordable housing provision (70 per cent social rented, 30 per cent shared ownership).</p> <p><u>Benefits</u> – range of benefits per dwelling £0-2000 (approximately) based on potential savings. The low end reflects the case where eco-towns deliver not net additional affordable homes.</p>

**Table 24: PPS standards and key assumptions for present value calculations
(continued)**

PPS standards	Key assumptions for present value calculations
Real time energy monitoring systems	Illustrative average costs and benefits per meter (i.e. per dwelling) are set out in table 18. There is a range of costs and benefits depending on assumed functionality.
High speed broadband access	This IA assumes no additional costs or benefits associated with eco-towns (compared to standard development). See section 9.
Employment	<p><u>Costs</u> – illustrative average unit (per dwelling) cost is assumed to be in the range £1,900-4,978 (eco-town development assumed to meet 75 per cent of jobs requirement; with standard development assumed to meet between 50 per cent and 65 per cent of jobs requirement). See section 10 for further explanation.</p> <p><u>Benefits</u> – illustrative average unit (per dwelling) cost is assumed to be in the range £1,900-3,500, based on evidence on employment land values.</p>
Local services	Not included in calculations as not quantified.
Water	<p><u>Costs</u> – a range of illustrative average unit (per dwelling) costs are set out in table 22.</p> <p><u>Benefits</u> – average unit (per dwelling) benefits by year of construction are estimated (PV of annual savings in period up to 2038) on the basis of households reducing their consumption by about a third. See section 12.</p>
Green infrastructure and biodiversity	Not included in calculations as not quantified.
Landscape and historic environment	Not included in calculations as not quantified.
Waste	Not included in calculations as not quantified.
Flood risk management	Not included in calculations as not quantified.

F. Future monitoring and evaluation

This IA provides a broad indication of the impacts associated with Eco-town developments, as specified by the PPS. Government will continue to assess the evidence as development of eco-towns moves forward.

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 locations announced as having the most potential to deliver high-quality eco-town developments. An extensive assessment process has informed decisions on the final list of locations; this has included a detailed 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.

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	Yes
Sustainable Development	Yes	Yes
Carbon Assessment	No	Yes
Other Environment	Yes	Yes
Health Impact Assessment	No	Yes
Race Equality	No	Yes
Disability Equality	No	Yes
Gender Equality	No	Yes
Human Rights	No	Yes
Rural Proofing	No	Yes

Annexes

Specific Impact Tests

Competition Assessment

PPS: Eco-towns 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. Such clear establishment of the eco-towns concept should provide a level playing field for firms to compete to provide housing that meets the key planning tests. Nil detriment to competition is envisaged. Rather, the PPS may incentivise innovation in the design and construction of sustainable new settlements, which could improve competition by encouraging new players to enter the market to compete with established firms reliant upon well-established pattern book design.

Small Firms Impact Test

Planning context

There is currently a 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). PPS: Eco-towns is unlikely to alter this bias. However, detailed planning applications in eco-towns are likely to be sought by small firms (where a master developer prepares plots to be sold on to house builders for development). Small, medium and large developers alike will be required to meet the same set of key planning tests established in PPS: Eco-towns in order to receive full planning consent. Planning application fees will not be higher in eco-towns, though it is recognised that the administrative burden associated with planning applications may be higher (see main evidence section on Masterplanning and Transition).

Potential costs of standards to small business

Crucially, all developers (small and large) 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 developers are less able to absorb additional cost than larger, better resourced developers, a marginal detriment to small developers is envisaged. Smaller developers might choose to address this through approaching eco-town development on a consortium or other collective basis and approaches for small business are detailed below. The development of eco-towns can be expected to open opportunities for the many small niche firms engaged in the development and supply of environmental technologies.

We do not expect any significant direct additional costs as a result of the higher eco-town standards to businesses located in eco-towns. There may be some higher service costs to businesses occupying commercial property in eco-towns, resulting from the use of new technologies, for example, renewable energy systems, but it is envisaged that these would

be offset by some combination of benefits (such as fuel cost savings) or capitalised in lower rental charges.

Further mitigation

PPS

The PPS requires that any planning application for an eco-town should be accompanied by an economic strategy. This should demonstrate how access to employment will be achieved, and set out facilities to support job creation in the town. This should also set out how a minimum of one employment opportunity per dwelling will be provided that is accessible by walking, cycling and/or public transport. The PPS further requires that applications should set out the detailed timetable for delivery of employment and community facilities and services, alongside plans for the operation of priority core services such as public transport infrastructure and services.

TCPA eco-towns economy worksheet

Government has also commissioned the Town and Country Planning Association (TCPA) to work closely with stakeholders to produce worksheets⁷⁰, including one on developing effective economic strategies for eco-towns, which set out principles, information and flexible models for best practice. This series is being made available as a resource for planning and designing eco-towns.

The worksheet on developing effective economic strategies for eco-towns highlights the importance of an economic 'offer' based on detailed consultation and consideration of sub-regional business needs and opportunities, including consideration of barriers constraining small start-up business's ability to survive and grow in the sub-region.

The worksheet explains that this offer should be underpinned by identification of support requirements for business, including amongst others provision of small and medium sized enterprise (SME) finance and business support; provision of flexible, affordable and appropriate business space; business networking and exchange structures; and provision of appropriate transport infrastructure. The worksheet also highlights that provision of business space and business support should address new enterprise formation, and be tailored to meet the evolving needs of individual business owners and micro enterprises across a variety of sectors.

Consultation

Process

There was an extensive and wideranging consultation held on the PPS and supporting documents, which ran from the 4th November 2008 to the 30th April 2009. This engaged with communities through an extended series of road-show events held in local communities, advertised in local press and via Parish Councils, to encourage

⁷⁰ Available to view at: www.tcpa.org.uk

representations from the widest possible cross-section of the community, including small businesses. At these events, all sections of the community, including small business, could speak directly to eco-towns policy staff, ask questions, learn more about the eco-towns programme, and feed into the consultation via a simple written response form, or via brief 'vox pop' video interview if preferred. There were also interactive screens at roadshow events providing detailed information and allowing visitors to give their feedback.

In addition, stakeholder events were held to which small business representative organizations such as local chambers of commerce and the Federation of Small Business were invited. A dedicated eco-towns website was set up on the internet, providing an accessible and user-friendly means for all sections of the community, including small business, to learn more about the eco-towns programme, and to easily register views to feed into the consultation. All of this has been in addition to the standard option of formal response to the PPS consultation, which was available both on-line and in writing.

Response

The consultation generated a number of responses from small businesses and small business representative groups such as the Federation of Small Business. In addition to these, through the written consultation and stakeholder events, there were a considerable number of individual representations which may also cover small business interests, but which are harder to relate to specific small businesses. All these responses have been considered as part of the consultation, and taken into account in the finalisation of the PPS.

Small business has primarily commented on potential effects of proposed eco-towns in their locality, rather than the strategic policy laid out in the PPS. Comments on proposed locations have been considered as part of the consultation, and all proposed eco-town locations have been subject to sustainability and financial viability appraisals, available here: www.communities.gov.uk/housing/housingsupply/ecotowns/.

Publication of PPS: eco-towns does not represent permission from Government for specific eco-town proposals to go ahead. Any proposals for eco-towns will need to be considered for approval through the normal planning system. Through the planning system, small business, alongside communities as a whole, will be able to comment as schemes are developed in a local context, either through the relevant Local Development Framework or through submission of an eco-town planning application.

Where small business concerns have focused on issues of strategic policy as laid out in the draft PPS, these have been primarily in terms of concerns that emphasis should be placed on economic development and job creation, reflecting the specifics of local or regional context, and that delivery of jobs must be co-ordinated with delivery of housing.

PPS: eco-towns responds to this, by requiring all eco-town planning applications be accompanied by an economic strategy demonstrating how access to work will be achieved. The strategy should also set out 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 and other sustainable options. It is hoped that these principles will actually promote new enterprise opportunities and encourage small businesses to locate in eco-towns.

This is further supported by PPS requirements on master planning and transition, which require demonstration of how eco-town standards will be achieved, demonstrating a high level of engagement and consultation with prospective and neighbouring communities; along with detailed timetabling for delivery of employment and community facilities and services.

More specifically, on the one hand it was felt that the production of commercial and industrial units could provide an opportunity for SMEs, however the higher costs associated with specialist or high end units (which an eco-town would have to be to comply with standards) could undermine business start ups.

It was also suggested that SMEs do not have the robustness or business models to accommodate working within a zero carbon environment – and this could limit the selection of business opportunities. The view was promoted that large retailers, rather than small enterprises, were more likely to invest because of the level of commitment required. It was argued that if the economic landscape of eco-towns is dominated by a small number of large businesses then the very principal of sustainable communities would be undermined.

The PPS makes clear that eco-towns need to be diverse and sustainable communities. The requirements for development of an economic strategy for the eco-town, masterplanning and transition management support this.

The PPS does not require individual small businesses to achieve specific zero-carbon targets on their non-domestic buildings. It would be expected that a zero-carbon requirement set at the town level would be implemented and managed strategically at the level of the eco-town development; in terms of delivering infrastructure, monitoring and ensuring compliance; these elements would not be expected to place additional burdens upon individual businesses.

However, higher service charges might expect to be levied on business tenants to support maintenance of higher-standard premises or infrastructure. But set against this would be the expectation of lower running costs due to increased energy and resource efficiency.

As noted above, the TCPA worksheet on developing effective economic strategies for eco-towns highlights the importance of these strategies identifying and addressing the business support, finance, accommodation and infrastructure needs of business, including SMEs and micro-enterprises, across a range of business sectors. The suite of TCPA worksheets are being made available as a resource for planning and designing eco-towns.

Concerns were also expressed that the eco-towns programme might by-pass the planning process. The PPS addresses this, by making clear that proposals for eco-towns must be taken forward through the existing planning system.

Rural Proofing

Eco-towns will provide new housing in relatively rural locations. Many such areas suffer from a lack of housing and from 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.⁷¹ New development may also bring other benefits to rural populations, such as improved connectivity to higher order centres; new local services such as schools and shops and potential regeneration benefits.

Consistent with the Taylor Review of Rural Economy and Affordable Housing, eco-towns planning policy aims to ensure that eco-towns achieve high standards of social, economic and environmental sustainability, by setting out a range of challenging and stretching minimum standards for their development: providing a good quantity of quality green space in close proximity to the natural environment; offering opportunities for space within and around dwellings; promoting healthy and sustainable environments through 'Active Design' principles and healthy living choices; and enabling opportunities for infrastructure that make best use of technologies in energy generation and conservation in ways that are not always practical or economic in other developments.

Eco-towns will be required to deliver a locally appropriate mix of housing type and tenure to meet the needs of all income groups and household size; economic strategies and minimum levels of employment provision easily accessible by walking, cycling and/or public transport; a good level of provision of local services within the eco-town; and taking advantage of significant economies of scale and increases in land value to deliver new technology and infrastructure. PPS: Eco-towns makes clear that planning applications for eco-towns should demonstrate a high level of engagement and consultation with prospective and neighbouring communities.

There may be concerns about increased urbanisation, but the aim for eco-towns is to mitigate the potential impacts of urbanisation through significantly higher sustainability standards. PPS: Eco-towns sets very high standards for development, which should reduce the impacts associated with urbanisation. For example, the PPS sets a transport target for significant non-car modal share. The PPS also requires 40 per cent of an eco-town's total area to be allocated to green space, of which at least half should be public and consist of a network or well-managed, high-quality green/open spaces which are linked to the wider countryside; and that planning applications should demonstrate a range of types of green space, thereby helping to maintain a rural feel.

⁷¹ www.defra.gov.uk/rural/arh/commission-report.htm

The PPS puts strong standards in place to protect the environment in locations where eco-towns are proposed; setting robust targets for water management and efficiency, for waste management, and for protection and enhancement of the local landscape and historic environment. It requires that developers and local planning authorities take into consideration the Sustainability Appraisal and the Habitats Regulation Assessment undertaken for PPS: eco-towns.

The PPS makes clear eco-towns should demonstrate a net gain in local biodiversity and planning permission may not be granted for eco-town proposals which have a significant adverse effect on internationally designated nature conservation sites or Sites of Special Scientific Interest. The PPS requires that a strategy for conserving and enhancing local biodiversity should be produced to accompany planning applications for eco-towns: based on up-to-date local information; setting out priority actions in line with local and national biodiversity strategies; include appropriate mitigation and compensation measures as appropriate; and seeking the advice of Natural England and other relevant statutory advisers.

Health Impact Assessment

The standards of PPS: eco-towns have been developed to mitigate any health impacts. The PPS makes clear that eco-towns should be designed and planned to support healthy and sustainable environments and enable residents to make healthy choices easily. In addition, the PPS aims to ensure the high standards achieved should be maintained in the future.

The approach codified in eco-towns planning policy is one which supports active living, with an emphasis on walking and cycling, and accessible green space. The benefits arising from transport standards limiting car journeys should include a comparative reduction in pollution, with associated effects on air quality and health of residents.

In addition, it seeks to deliver a built environment, which supports lifelong accessibility; for example, through adherence to Lifetime Homes Standards.

Legal Aid

There will be no legal aid impact.

Sustainable Development

This test considers policy in light of its social, environmental and economic sustainability, as covered by the full spread of Specific Impacts Tests, and further considers policy in light of the five principles of sustainable development to which the Government is committed. These are: living within environmental limits; ensuring a strong, healthy and just society; achieving a sustainable economy; promoting good governance; and using sound science responsibly. Eco-towns planning policy, as set out in PPS: Eco-towns, is aimed to take a significant step forward in meeting these principles, by enabling the development of socially, environmentally and economically sustainable communities. Detailed evidence is set out in section E of this IA.

Carbon assessment

Eco-towns provide an opportunity to deliver new, zero carbon settlements. The eco-towns provide an opportunity to directly reduce carbon emissions (relative to the emissions that would be associated with standard development). Reductions in carbon emissions can be expected from the built environment: eco-towns must be zero carbon, which means that over a year the net carbon dioxide emissions from all energy use within the buildings on the eco-town development are zero or below. Eco-towns also provide an opportunity to design a living and working environment where households and businesses can cut their carbon emissions and ecological footprints. For example, this includes sustainable travel patterns supported by local schools and employment provision, provision of low carbon public transport options and cycling facilities. These are carbon savings that are unlikely to be matched by standard developments which do not need to meet the same specific standard or plan for zero carbon living from such an early stage.

This IA (section E) provides evidence on, and illustrative estimates of, the carbon reductions that may be associated with the built environment. The policy aims not to be prescriptive in terms of how zero carbon development should be achieved, which means developers have the flexibility to find the most cost effective solution for their development, though this IA makes a number of assumptions to illustrate how carbon savings may be realised.

The estimated carbon savings presented in this IA are likely to understate the benefits that should be realisable because:

- the carbon savings associated with the sustainable living patterns that may be possible within eco-towns due to the whole-site approach have not been included
- the carbon savings associated with buildings only include cuts in regulated emissions (while further cuts in regulated emissions and unregulated emissions should be possible)
- the carbon savings associated with buildings are only estimated for a standard 30-year period, while the benefits can be expected to flow for many years beyond this (particularly for houses and associated infrastructure built later on)
- the carbon savings estimated do not capture the benefits of learning (for example, in terms of construction and ways of living) that may show the way for future developments and government policy, to support carbon savings beyond the eco-towns.

Other environmental issues

Eco-towns planning policy, as set out in PPS: Eco-towns, presents a model to deliver large-scale development to significantly higher environmental standards than would apply to standard developments, across a broad range of relevant areas, including: carbon emissions; climate change adaptation; green infrastructure; biodiversity; water; flood risk management and waste. The PPS also sets relevant standards to support healthy living, community, local services, landscape and the historic environment, and high standards for eco-town homes. Detailed evidence is set out in section E of this IA.

Race, disability and gender equality

We have undertaken a screening of eco-towns planning policy for race, gender and disability equality, and on the basis of that do not believe any specific equalities impacts will arise.

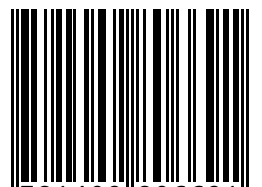
In supporting high-quality, inclusive and accessible housing, design and planning, alongside engaged and empowered communities, eco-town planning policy can be expected to have some positive benefits across some aspects of disability equality.

Human rights

We have considered the implications of eco-towns planning policy for human rights and can identify no human rights impacts.

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