

**BUILDING IN A SMALL ISLAND?
WHY WE STILL NEED THE BROWNFIELD FIRST APPROACH**

for
Campaign to Protect Rural England

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by **Green Balance**



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Green Balance
9 West End
Kemsing
Kent TN15 6PX
Tel.: 01732 763591
Fax.: 01732 763990
E-mail: info@greenbalance.co.uk

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SUMMARY

S1 This report responds to one of the potentially most far reaching changes proposed in the Government's consultation draft National Planning Policy Framework. It examines the proposals to cease giving clear priority nationally to development on brownfield sites (formally called 'previously developed land') before greenfield. It also considers the implications of the related recent policy changes made by the Government to drop the minimum housing density range which has until recently been recommended as national policy.

S2 Current policy in Planning Policy Statements is set out as it affects development generally on greenfield and brownfield land, and specifically for housing and economic development. This is contrasted with the proposals in the National Planning Policy Framework. Great strides are shown to have been made over the last 15 years to secure more use of previously developed land (PDL), to the benefit of urban renewal, avoidance of countryside loss, efficiency in land use and transport, and the associated social benefits of all of these. There is a real risk that these achievements will be reversed by rescinding the policies which achieved them.

S3 The justifications for the proposed policy changes are examined, and found not to stand up to scrutiny. There appears to be an underlying misconception that PDL will not be replenished sufficiently at the same time as it is being built on, whereas the evidence demonstrates that there is an ongoing supply of PDL as part of the process of urban land recycling in a dynamic market. Indeed, across England as a whole replenishment has exceeded reuse since 2001. Detailed reasons to support the change of policy inadequately understand the land and housing markets, and at times give misleading impressions. None of the arguments put forward is found to be convincing.

S4 The official assessment undertaken by the Department for Communities and Local Government (CLG) of the likely effect of its proposals, and other scenarios, on the additional requirements for greenfield land, are reviewed. These are shown to under-estimate very substantially the damaging consequences for the countryside of the proposals in the draft National Planning Policy Framework.

S5 A detailed examination is undertaken of the use of PDL and its replenishment at the national, regional and local level, using the Government's own published data from the National Land Use Database and the Land Use Change Statistics. Information is provided by area of land and by number of dwellings. Areas of PDL available and suitable for housing are broadly appearing at the rate at which they are used, but with rising densities of housing (on brownfield sites especially), the study found that the capacity of that land to support housing development is increasing considerably.

S6 Special cases were examined where there might be particular difficulty in sustaining house building rates, especially if brownfield sites were no longer forthcoming. These included a case study local authority under considerable pressure for new housing supply but constrained by Green Belt outside the main urban area (Stockport), and also local authorities with housing supply commitments but virtually no greenfield sites physically available (Inner London Boroughs). In both cases, evidence over many years showed that these areas continued to supply large quantities of housing, entirely or almost entirely on PDL, often on 'windfall' sites that would have been difficult to predict in advance.

S7 A brief summary is provided of the impact of housing density policies. With urban densities often high or very high - half the London Boroughs have recently had average housing densities in excess of 100 dwellings per hectare (dph), for instance - there is concern that 'town-cramming' may be taking place to the detriment of dwelling sizes, the availability of private gardens, and family life. The evidence suggests that good design, construction and management can resolve these problems, so that urban living can be enjoyable and affordable to families and other households on modest incomes.

S8 The evidence demonstrates overwhelmingly that the existing policy on prioritising the development of 'brownfield first' has been very successful and that there is insufficient

justification for changing it. The Government is recommended to retain a strong commitment in the final National Planning Policy Framework to this well-established, effective and worthwhile policy. This includes continuing to monitor the current evidence base on the proportion of brownfield land being redeveloped, along with average densities of new housing, by local authority. A concern is identified that worrying gaps in the evidence may open up in the coming years without a continued commitment to the collection of relevant data.

S9 Key findings from a statistical review of the available data on supply and use of brownfield land include:

- Since a national target for the re-use of brownfield land was introduced into national planning policy in 1995, 143 square miles (36,680 ha) of previously developed land have been redeveloped for housing. Had this development taken place on greenfield land instead, an area of greenfield land at least seven times the size of Southampton would have been developed for housing.
- In England there is sufficient brownfield land available and suitable for residential development, based on 2009 figures, for 1,494,070 new dwellings. This is equivalent to around 10 years' supply at current (2009) rates.
- Of the national total given above, there is sufficient land available for 740,920 new dwellings in the southern regions (London, South East, and the South West).
- The proposed changes to national planning policy could lead, under scenarios projected by the Government, to the amount of greenfield land being used for housing more than doubling (a 158% increase).
- The highest aggregate re-use of brownfield land for new housing in recent years was in 2007, when overall housing output was also at its highest.
- More previously developed land was available and suitable for housing in 2009 than in 2001.
- Average residential densities have increased over the time that a brownfield first policy has been in force, from 28 dwellings per hectare in 2001 to 47 dwellings per hectare in 2009.
- In many areas of England, the success of a 'brownfield first' policy relies on local planning authorities being able to use 'windfall' sites which come forward during the life of a plan but which were not expected at the outset.

S10 Conclusions and recommendations are presented in Section 5.

1 INTRODUCTION

Aims and objectives

1.1 The Campaign to Protect Rural England (CPRE) commissioned this report to highlight the contribution made by policy promoting new building on previously developed land (PDL). These sites are commonly called 'brownfield' sites as distinct from 'greenfield' sites. The aim was to establish the scale of the benefit which a 'brownfield first' policy can make to the protection of our countryside and the regeneration of our town and cities. Housing development uses more land than any other type of development, so whether this is focused on greenfield or brownfield sites makes a particular impact on the use of land. The density at which housing is built also affects the total amount of land used, and the study would examine the impact of building at different densities, beginning with those densities typically associated with greenfield and brownfield sites.

1.2 Specific objectives of the report are:

- to provide the evidence base for the efficient use of land through a brownfield first approach in both national planning policy and national sustainable development policy; and
- to support CPRE local branches in making the case for local brownfield development rates and housing density targets in local plans.

Background

1.3 The draft National Planning Policy Framework, issued for consultation by the Department for Communities and Local Government (CLG) between July and October 2011, proposes some important changes to national planning policy, including the priority which should be given to placing new development on previously developed land. Urban regeneration has been a policy priority of successive Governments since the 1980s. Since 1995, there has been a specific national target for the overall proportion of new housing that is built on brownfield land. Initially this was 50% but was raised to 60% following the White Paper *Planning for the Communities of the Future* in 1998. From 2000 to 2010 both the national target and supporting policies on using brownfield land before greenfield ('the sequential approach') and requiring development to achieve a minimum density range (between 30 and 50 dwellings per hectare) had been enshrined in national planning policy.

1.4 There are significant advantages from focusing new development, particularly housing, on suitable brownfield land in urban areas rather than greenfield land. In particular, prioritising brownfield sites ensures the efficient use of land and other resources. New housebuilding has historically taken up more greenfield land than any other form of development. Between 1995 and 2009, however, 143 square miles (36,680 ha) of brownfield land have been redeveloped for housing (Department for Communities and Local Government, Land Use Change Statistics, live table 226.) In simple terms, if this housing had been built on greenfield land instead, an area of countryside at least seven times the size of Southampton (Southampton City Council's area is 19 square miles) would have been lost to housing. In addition, developing brownfield land before greenfield also enables existing buildings and infrastructure (particularly public transport, roads, sewers, water and energy services) to be used rather than building new, thereby minimising the use of natural resources such as aggregates.

1.5 The statistical background to this study is that 53% of dwellings built in England in 1997 were on previously developed land, a proportion that had changed little over the previous decade. After the introduction of more emphatic policies to promote the use of 'brownfield first', especially for housing, and a target of 60% on brownfield sites, this rose continuously to

78% on PDL in 2008¹. The number of dwellings completed in England in 1997 was 149,490, which rose to 175,560 in 2007 before falling away in the recession (to an estimated 103,300 in 2010)².

1.6 At present, national planning policy strongly supports the redevelopment of PDL as a priority, in the overarching PPS1 *Delivering sustainable development* (January 2005) and in supporting policy statements on housing and economic development. PPS1 states on the ‘Prudent use of natural resources’ (paragraph 21) that:

“The broad aim should be to ensure that outputs are maximised whilst resources used are minimised (for example, by building housing at higher densities on previously developed land, rather than at lower densities on greenfield sites)”.

PPS1’s general approach for local authorities delivering sustainable development through their development plans includes (paragraph 27):

“Promote the more efficient use of land through higher density, mixed use development and the use of suitably located previously developed land and buildings. Planning should seek actively to bring vacant and underused previously developed land and buildings back into beneficial use to achieve the targets the Government has set for development on previously developed land.”

1.7 PPS3 *Housing* (June 2011) is heavily committed to promoting the development of housing on PDL, mentioning it 33 times. For example, paragraph 36 states:

“The priority for development should be previously developed land, in particular vacant and derelict sites and buildings”,

while paragraph 40 on the ‘Effective use of land’ states:

“A key objective is that Local Planning Authorities should continue to make effective use of land by re-using land that has been previously developed.”

Paragraph 41 includes a specific target for house building:

“The national annual target is that at least 60 per cent of new housing should be provided on previously developed land.”

1.8 PPS4 *Planning for sustainable economic growth* (December 2009) also gives priority to PDL. Here Policy EC2.1 requires that local planning authorities should seek:

“to make the most efficient and effective use of land, prioritising previously-developed land which is suitable for re-use”,

while Policy EC5.1 states that local authorities should amongst other points

“consider the degree to which other considerations such as any physical regeneration benefits such as developing on previously-developed sites... may be material to the choice of appropriate locations for development”

1.9 Furthermore, the UK Sustainable Development Strategy (UK SDS), most recently updated in 2005, refers clearly to ‘brownfield first’ as being a key component of sustainable development (UK Government, 2005, p.116). The Department for the Environment, Food and Rural Affairs (Defra) has also produced a range of indicators to measure the achievement of sustainable development. Of these, indicator no.25 covers both (a) new dwellings built on

¹ These figures exclude dwellings created from conversions of existing buildings. Including conversions, the figures were 56% on brownfield sites in 1997 and 80% in 2008. In 2009 both rates fell by one percentage point and are provisionally expected to fall again in 2010. Source: CLG Live Table P211.

² Source: CLG Live Table 244.

previously developed land or through conversions; and (b) all new development on previously developed land; while no.26 covers dwelling density. Measurement of progress against these indicators has been measured up until 2010 (see http://sd.defra.gov.uk/documents/SDI2010_001.pdf). Defra is now (as at November 2011) developing a new set of indicators.

1.10 It is clear from these statements that the Government has viewed the redevelopment of PDL as contributing both to national sustainable development policy (especially in PPS1 and the UK SDS) and to national planning policy (especially in PPS3 and PPS4).

1.11 The consultation draft National Planning Policy Framework makes a number of references to sustainable development, but it has no comparable reference to previously developed land. It has thereby dropped both the broad policy of building on brownfield sites first and, as announced in the Chancellor's *Plan for Growth* in March 2011, the target that at least 60% of housing should be built on PDL. Minimum residential density ranges had also been removed from PPS3 shortly after the change of Government in 2010. So far as office and commercial development are concerned, the draft NPPF also proposes to drop the 'sequential approach', prioritising town centres (which tend to offer PDL) over edge of town and out of town sites (which are much more likely to be greenfield sites), though the sequential approach is retained for retail and leisure functions (paragraphs 77-79). The nearest that the draft NPPF comes to referring to 'brownfield first' is in paragraph 165:

"In preparing plans to meet development requirements, the aim should be to minimise adverse effects on the local and natural environment. Plans should allocate land with the least environmental or amenity value where practical, having regard to other policies in the Framework including the presumption in favour of sustainable development. Plans should be prepared on the basis that objectively assessed development needs should be met, unless the adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in the Framework taken as a whole."

1.12 This policy does not specifically mention previously developed land, brownfield sites or any sequential approach to directing development to them. It does, however, leave open the opportunity for local authorities to interpret the national policy that way (or in other ways). This is well short of the clear direction laid down in existing national planning policy. This is the proposed change of policy which has inspired the commissioning of the current study.

1.13 Ministers have sought to justify the proposed change in approach as being more environmentally sensitive than the current 'brownfield first' approach. The current definition of brownfield can sometimes include land that has acquired significant biodiversity value, such as in some former quarries and waste ground. Evidence suggests that sites with high biodiversity potential form a minority of brownfield sites overall. Between 2005 and 2007, Buglife assessed 478 brownfield sites in the Thames Gateway for their biodiversity potential, focusing particularly on invertebrates (Buglife, *Developing Brownfield Without Destroying Biodiversity*, 2011). 24% (115) were assessed as having high potential. Wildlife & Countryside Link has stated in its response to the draft NPPF (available from www.wcl.org.uk; endorsed by Buglife, the RSPB and the Wildlife Trusts as well as CPRE and others) that the solution to this problem is to refine the definition of previously developed land to exclude categories of land of proven high biodiversity value. Critically, Wildlife and Countryside Link also calls for the Government to retain an overall brownfield first approach to new housing development.

Structure of the report

1.14 Reasons for not continuing the 'brownfield first' approach are provided by CLG in an accompanying *Impact Assessment* to the draft NPPF. These are analysed in detail in Section 2. The arguments advanced in the *Impact Assessment* necessitate a comprehensive response, so this section ranges over issues as diverse as land prices and house prices, the supply of brownfield sites, house building rates on brownfield and greenfield sites, and the impact of housing density assumptions on land requirements.

1.15 Section 3 examines by a series of methods whether there is evidence that previously developed land is 'running out' at the national, regional and local level, or whether there is replenishment for the PDL built on. It shows that brownfield land is not a static quantity to be drawn down, but a dynamic ongoing contribution to urban land recycling and modernisation. Experiences are reviewed particularly in localities where there are strong policies to resist development on greenfield sites or virtually no greenfield sites available, to see whether housing supply is constrained. The contributions of unexpected 'windfall' sites and of the amount of housing development on garden land ('garden-grabbing') are both considered in this context.

1.16 The higher densities associated with brownfield housing development compared with greenfield development can be a source of concern that urban brownfield housing will cause 'town-cramming' and a poor living environment for residents, especially families. Section 4 therefore considers briefly some of the consequences arising from the choice between greenfield and brownfield development for families on modest incomes, and reviews the opportunities for high density housing developments which meet their needs without compromising quality of life. This draws on work previously published by CPRE (and others).

1.17 Conclusions and recommendations are presented in Section 5.

2 THE IMPACT OF 'BROWNFIELD FIRST' ON THE HOUSING MARKET

2.1 CLG has issued an *Impact Assessment* to underpin its proposals to abandon a target percentage of housing development on brownfield sites and to move away from the policy on 'brownfield first' when prioritising land for development. The justification for the policy changes rests in large measure on the adverse effect of the existing policies on the housing market. Undesirable effects are suggested in terms of land price, land supply and numbers of houses built. The proposals also accept that the density of houses built would reduce and that more greenfield land would therefore be required. This section reviews those arguments.

Land prices

2.2 In its 'Description of the policy options' (page 50 of the *Impact Assessment*), it is argued that under the 'do nothing' option "the existence of a [60% brownfield] target inflates the cost of brownfield land which is then sold at a premium, representing a cost to the final consumers of housing. The national target is likely to continue to stifle housing growth....".

2.3 Land price is widely appreciated in the housing and planning sectors as a residual in the way the housing market works, not a driver of house prices. In essence, the price of new houses is set by the price of existing houses. That is because new houses account for around 10% of all the houses on the market at any one time, so new houses must reflect the price of the majority of houses³. They cannot lead the prices of the other 90%. With an approximately known figure for the sale price of a new house, a builder subtracts from that the cost of materials and construction, together with a profit margin and interest charges on money borrowed, to arrive at a sum which can be bid for the land. Competition between builders for the land, shaped by their individual circumstances and the types of dwellings they propose for a site, determines the price payable to the landowner. If this price is below the landowner's aspiration then nothing happens, but otherwise a sale can proceed and development is an attractive proposition for all parties. This logic applies whether the land is greenfield or brownfield.

2.4 Prioritising brownfield land as a matter of policy, or constraining the supply of greenfields in the process, makes little difference to this. Even if the available supply of brownfield sites is limited, the economic principles remain the same. To the extent that shortage of land supply generates competition for that which is available - and owners will naturally try to maximise the price they can get - there will be a squeezing of costs and profit margins, and a search for higher value products to build on the site, but otherwise little change to the sale price of the land. This kind of competition is normal in the housing market and is not a function of whether the land is brownfield or greenfield: rather it is potential profitability which stimulates the competition. Moreover, evidence shows that the effect of planning policy is to harness such competition to encourage developers to innovate and bring forward more brownfield land for development than might have previously been predicted⁴.

The supply of brownfield sites

2.5 The target of at least 60% of new housing development on brownfield sites could not have survived as long as it did if the amount of brownfield land available was so low that the overall number of houses intended could not be provided with that proportion on such sites. There must be sufficient availability of brownfield sites for the policy to be worthwhile. The same is not so true of a 'brownfield first' policy - the aim could be to use up brownfield sites first even if there were few such sites available - but nonetheless that policy has more to offer where there are plenty of brownfield sites available.

³ See, in particular, Barker K, Review of Housing Supply - Final Report, March 2004, paragraph 1.27. A fuller examination of this issue can be found in Planning for Housing Affordability, a report by Green Balance for CPRE, July 2007.

⁴ See paragraph 3.3 below.

2.6 The *Impact Assessment* makes a series of claims about an emerging shortage of brownfield land, in the following terms in ‘Problem under consideration and rationale for intervention’ (page 49):

“The stock of (viable) brownfield land varies by local council, and in some areas is becoming a constraint on development. Internal analysis based on Homes and Communities Agency data shows, for example, that 88 (or 27 per cent of) local councils currently have less than five years of brownfield land suitable for housing based on current build and density levels [ref: NLUD 2009]. Nationally too, the amount of brownfield land available is dwindling. Internal analysis gives an illustration that, under plausible assumptions, the brownfield land target would cease to be sustainable in the (high demand) southern regions by 2015-16. Therefore, keeping the target beyond that point would result in a reduction in the overall level of development in these areas. Set against rising demand, this would imply higher prices.”

2.7 Each of these claims is evaluated below. Fundamentally, at the root of the claims in the *Impact Assessment* is a surprising misunderstanding about brownfield land. This is not a static, fixed supply that becomes drawn down through use, but a dynamic element in the land market which is continuously being replenished. Existing uses of land are no longer required and opportunities are opened for new ones.

(i) *Insufficient local authority supply of brownfield land?*

2.8 The claim that 27 per cent of local councils currently have less than five years of brownfield land suitable for housing based on current build and density levels is not entirely clear. This probably means ‘to sustain their current rate of supply on brownfield sites’, but could be intended to mean:

- ‘without the need to build a single house on a greenfield site’, or
- ‘to achieve 60% of construction on brownfield sites in line with policy’.

The claim clearly makes the basic error of assuming that no more brownfield sites will become available in future. It worryingly focuses on the alleged 27% minority rather than the 73% majority which clearly do have substantial PDL available, based on the National Land Use Database (NLUD) report for 2009.

2.9 The claim misrepresents policy by suggesting that a deficiency of brownfield sites “in some areas is becoming a constraint on development”. This confuses the supply of brownfield sites with overall housing provision. If brownfield sites are not providing sufficient housing, the onus is on the local planning authority to find homes by other means: whether using empty homes, conversions of other premises, or building on greenfield sites. The aim of the policy is not to reduce overall housing supply so that at least 60% of it is on brownfield sites, but to secure the policy level of house building while trying at the same time to procure at least 60% of it from brownfield sites. The overall level of development should not be ‘constrained’ by brownfield land supply.

(ii) *‘The amount of brownfield land available is dwindling’*

2.10 The annual NLUD reports identify the overall amount of previously developed land available and also the proportion of it which is ‘suitable for housing’. The latter is described as ‘viable’ in the quote above from the *Impact Assessment*. Data are collected at local authority level and also presented as regional and national statistics. The amount of brownfield land suitable for housing has been increasing. Table 1 shows that after many years having been within the range of 26,500-29,500 hectares, the most recent data show an upward trend and in 2009 the largest ever recorded national supply of over 31,000ha. Furthermore, the most recent figures for 2009 show that brownfield land could support a record high level of house building at assumed densities, sufficient for 1,494,070 houses on the Homes and Communities Agency’s calculation, as Table 1 shows.

Table 1 Previously developed land available in England

Year	NLUD PDL suitable for housing (ha)	NLUD PDL total (ha)	NLUD PDL dwellings estimate
2001	28,060	65,500	919,100
2002	28,520	66,110	884,200
2003	29,480	65,760	949,800
2004	28,650	64,130	986,000
2005	27,640	63,490	980,700
2006	26,750	62,730	974,000
2007	26,510	62,130	1,051,030
2008	28,810	63,750	1,209,630
2009	31,160	61,920	1,494,070

Source NLUD data from annual reports (Table numbers vary)

2.11 The *Impact Assessment* uses data selectively to support its claim that “Nationally too, the amount of brownfield land available is dwindling”, by referring to the overall amount of brownfield land available rather than the fraction of it ‘suitable for housing’. The reduction in total brownfield land from its peak in 2002 through to 2009 was less than 10%, so even on this basis was ‘dwindling’ only very slowly. Far from the supply of brownfield land suitable for housing ‘dwindling’ or being ‘a constraint on development’, it is in reality increasing at present and at its highest ever level in the most recent figures.

(iii) *For how long could the brownfield target be sustained in southern regions?*

2.12 There are inevitably regional variations in the supply of brownfield land suitable for housing, and there is a particular need for it in areas of greatest housing requirements if the policy is to be most effective. The *Impact Assessment* suggests that there is a brownfield land supply problem in the southern regions so severe that a 60% brownfield target could only be met for five more years (to 2015-16). The data do not support this.

2.13 The amount of brownfield land available each year in the three southern regions is set out in Table 2, and the numbers of dwellings estimated by local authorities as achievable on that land are given in Table 3.

Table 2 Previously developed land suitable for housing in southern regions (ha)

Year	South East	South West	London
2001	4,750	2,640	2,470
2002	5,700	2,860	2,120
2003	5,410	3,720	1,890
2004	5,390	3,160	1,950
2005	5,280	2,950	1,850
2006	5,220	2,760	1,910
2007	4,580	2,600	2,130
2008	5,420	3,040	2,530
2009	5,410	3,430	3,580

Source: NLUD data from annual reports (Table numbers vary)

Table 3 Estimate of dwellings deliverable on PDL suitable for housing in southern regions

Year	South East	South West	London
2001	119,300	107,400	149,200
2002	137,500	98,900	117,600
2003	151,400	135,600	114,500
2004	160,200	118,700	132,100
2005	160,700	99,200	125,300
2006	160,500	90,100	130,000
2007	151,390	90,000	170,120
2008	173,870	105,340	236,780
2009	179,780	109,030	452,110

Source: NLUD data from annual reports (Table numbers vary)

2.14 The data show that brownfield land supply suitable for housing is at its highest ever recorded level in London, at its highest level for five years in the South West and little changed in recent years in the South East (see Table 2). After taking into account the density of building achieved each year, the brownfield land available could supply the largest number of dwellings since records began in London and the South East, and the largest number for five years in the South West (see Table 3). The data suggest that, despite house building on brownfield land, the supply of brownfield land in southern regions is generally increasing (or at worst fluctuating only a little). (If the East of England is included in ‘southern regions’, there has been a marginally downward trajectory in the trend in supply of brownfield land there, though the amount of housing deliverable on it has increased due to increasing densities (with a peak in 2008).)

2.15 The “plausible assumptions” to justify the claim in the *Impact Assessment* of a shortage of brownfield land in the southern regions have not been presented. The Government’s own figures in the National Land Use Database show that at current densities there is enough brownfield land for 100% of all housing in the southern regions to be built on brownfield sites at pre-recession building rates for comfortably more than five years, even without a single additional brownfield plot becoming available. In reality, the data demonstrate that the new supply of brownfield land has generally exceeded its rate of use. The assumptions of the *Impact Assessment* combined are likely to be far from “plausible”, and the claim that there is a shortage of brownfield land in southern regions is scaremongering. The claim that keeping the target beyond 2015-16 would result in a reduction in the overall level of development in these areas is without foundation.

2.16 Section 3 examines in more detail the ongoing supply of brownfield sites at the regional and local level to provide greater insight into this key issue.

House building

2.17 The *Impact Assessment* makes four claims about the adverse effect of brownfield targets (and by implication the ‘brownfield first’ policy) on housing supply. These are examined below.

(i) *‘High remedial costs stifle housing growth’*

2.18 “The national [brownfield] target is likely to continue to stifle housing growth even in areas where there is a substantial amount of undeveloped land if remedial costs are high” under a ‘do nothing’ policy option (*Impact Assessment*, page 50). This claim arises from the erroneous assertion that targets push up brownfield land prices (see paragraphs 2.2-4), and to that extent can be neglected. Housing will be developed on land with high remedial costs provided the residual land valuation is attractive to the prospective vendor (also explained above), but the assumption should not be made that high remedial costs are a widespread issue affecting brownfield land. The *Impact Assessment* overstates the impact of remediation costs on the redevelopment of brownfield land in three respects (see Appendix 1).

(ii) '*Prioritising brownfield constrains cities from growing to be more efficient*'

2.19 An adverse effect of brownfield targets on housing supply is claimed to be that a brownfield target "can constrain city growth, such as in the form of greenfield development. Where planning has this impact, the benefits of labour market pooling and supplier specialisation for larger towns and cities may be constrained (Barker, 2006)" (page 51).

2.20 Avoiding the need for greenfield development was of course one objective of the brownfield policy in the first place (along with rejuvenating urban areas). The argument is therefore somewhat odd, apparently supporting the outward growth of urban areas (sometimes feared to be in the form of urban sprawl) as a matter of principle.

2.21 The level of economic benefit which might accrue from labour market pooling and supplier specialisation was indicated by Kate Barker in her interim report in July 2006 to which reference is made. She said "The planning system has the potential to influence the size and development of agglomerations of economic activity. Larger towns and cities may reap benefits in the form of labour market pooling and supplier specialisation. Where planning constrains city growth it will constrain these benefits - one recent study has suggested doubling the size of a city can result in productivity gains of three to eight per cent" (paragraph 6.63). There is no indication whatever from Kate Barker that her observation was expected to be used as an argument against developing brownfield sites, or for developing greenfield sites in the urban fringe. Indeed she only referred to this issue once in her Interim Report (paragraph 8.60), where she lamented the absence of fiscal pressure to bring forward brownfield land for recycling at a faster rate.

2.22 This is clearly an academic finding rather than a plan for action: even in boom years new house building only adds 1% to the stock of housing each year, so even if this was concentrated in city expansion the doubling of a city's size could take many decades. Switching the construction of housing from within the urban area to the periphery would take a high level of agreed policy over a very long period to secure these 3-8% productivity gains. Against these modest benefits would need to be set the economic and other impacts of leaving behind a swathe of unrecycled brownfield sites within the urban fabric. Might not those quickly and easily outweigh the productivity gains from the outward growth? Indeed was the benefit from outward growth predicated on the assumption that the pre-existing urban area would remain in healthy economic use? Urban renewal and land recycling within built-up areas are likely to be very important for the social and economic attractiveness of towns and cities, and should not be sacrificed on the false prospectus that peripheral expansion is superior.

2.23 By invoking productivity gains from greenfield expansion, CLG appears to be struggling to identify wider benefits to the economy from abandoning a brownfield policy. Meanwhile its *Impact Assessment* ignores the costs to society of extra brownfield land left unused in urban areas: "It is not anticipated that there will be wider economic costs as previously developed land will be available for appropriate uses such as economic development". The problem of course is that much of it could be permanently available and unused, blighting localities and generating significant adverse economic, social and environmental effects. The experience of leaving the cores of US cities to the market when peripheral expansion is barely constrained too frequently illustrates what can happen. Neglecting this is a remarkable oversight.

(iii) '*The extra choice from offering more greenfield sites would promote competition*'

2.24 The third argument in the *Impact Assessment* about the adverse effect of brownfield targets on housing supply is that "Greater flexibility and the potential for more land to become available could foster greater competition between viable sites and also provide greater choice for alternative uses such as economic and community uses" (page 51). The tabulation of impacts in its Table B3.1 suggests that an effect of this would be to "Increase housing supply and meet housing need".

2.25 There is indeed a high likelihood that fewer brownfield and more greenfield sites would be used in the absence of the brownfield first policy. This would reflect the ability of

landowners and developers to make more money from greenfields in some cases (accepted in the *Impact Assessment* as a direct benefit to business, page 56). Economic theory supports the argument that, as well as creating a shift of development from brownfield to greenfields, an effect would be to increase marginally the overall level of production, by virtue of a constraint on profitability being eased. The *Impact Assessment* accepts that this would mean the development of a small additional amount of greenfield land. The amount of additional housing that would be supplied is conjectural but would be minor: distinguishing the extra building attributable to the ‘extra choice’ rather than the many other influences on building rates would be remarkably difficult.

2.26 Any impact on house prices and affordability of removing the brownfield first policy would depend on extra house building rather than on extra land supply itself. The *Impact Assessment* is rightly cautious about claiming any likely effects, noting in Table B3.1 only that “An increase in housing supply could result in improved housing affordability.” A long established reality is that extra land is an extremely inefficient way of achieving extra house building, and extra house building is an extremely inefficient way of reducing house prices. This is because prices are to a large degree fixed (in the economist’s jargon) on the demand side rather than the supply side: it is largely the ability and willingness of buyers to pay that direct prices⁵. It is easy to see why this is the case: the supply of housing is largely fixed in the short term and increasing far too slowly to depress prices perceptibly. Furthermore, builders have no interest, like any other industry of course, in flooding the market with so many houses that the sale prices of their products are depressed. It is personal wealth, lending policy, mortgage rates and confidence in the direction of house prices which shape the market.

(iv) ‘There are private economic gains from building adjacent to green space’

2.27 Finally, the *Impact Assessment* offers a novel argument in support of the economic case for building houses on greenfield sites: “evidence shows that housing coupled with green space, such as parks, is valued much more highly than open green space: £10.8m (present value) for one hectare of city park (i.e. urban core public space). Gibbons et al. (2011) found that a 1 per cent increase in ‘green space’ increased the value of housing by 1.04 per cent⁶. This highlights that the addition of nearby housing to green space can increase the value placed on green space.”. An alternative and perhaps more realistic interpretation of this information would be: ‘building on the greenspace enjoyed by existing residents will not only deprive them of amenity but also reduce the value of their houses’.

Housing density

2.28 The *Impact Assessment* includes an illustrative assessment of the extra land requirements if the policy pressure to develop brownfield sites rather than greenfield sites was removed. It attempts to distinguish two separate effects: the extra land required because the density of development is typically lower on greenfield sites than on brownfield sites, and the extra land required because the rate of house building is assumed to increase (all of which would be on greenfield sites). It is worrying that the numerical presentation and Table B3.2 are defective due to basic arithmetical errors. The actual land take required would be very substantially greater than indicated in Table B3.2. The correct calculations are set out below, together with other illustrative options.

(i) *Switching a proportion of housing to greenfield sites*

2.29 Scenario 1 in the *Impact Assessment* analysis is the ‘no change’ option, and Scenario 2 for comparison assumes that the proportion of development on greenfield sites rises from the current 20% of all dwellings to 27% (said to be the average rate of the last 10 years). Other greenfield/ brownfield splits could be chosen: Table 4 offers 48% greenfield, which the *Impact Assessment* suggests was the rate prior to 1995. Variants are also suggested below with the density of housing on greenfield sites dropping from their current 29dpa to their average for the last ten years (27dpa) as greenfield sites become more readily available.

⁵ Barker K, March 2004, *ibid*.

⁶ Gibbons, S., Mourato, S. and Resende, G. (2011) *The amenity value of English nature: A hedonic price approach*, LSE.

2.30 Scenario 1 in the *Impact Assessment* assumes an annual housing supply of 129,000 dwellings (CLG Live Table 118 for net additional homes, though unfortunately this includes conversions and changes of use). The land take at 2009 densities is given as 49 dwellings per hectare for brownfield sites and 31dph for greenfield sites (said by CLG to be taken from Live Table P231, though the figures in that table are 47dph and 29dph respectively). The greater density on brownfield sites is principally because the majority of these are in 'more urban' locations and greenfields in 'more rural' locations, and higher density developments tend to be particularly practicable in urban areas where higher density is the context and land is relatively expensive.

2.31 Table 4 shows that the differences in densities of housing development on greenfield and brownfield sites makes the greenfield land requirement particularly sensitive to the assumed proportion of development on greenfield sites: a switch of 7 percentage points in the mix increases greenfield land requirements by 35%, while a switch of 28 percentage points raises greenfield land requirements by 140%. The baseline figures used in Scenario 1 in Table 4 differ slightly from those used in the *Impact Assessment*, which misquoted the dwelling densities in 2009 from CLG Live Table P231 (which were 47 dwellings per hectare on brownfield land [not 49] and 29dph on greenfield land [not 31]) This also affected CLG's greenfield land requirement estimate in Scenario 2.

Table 4 Annual land requirements under greenfield/brownfield supply options

Supply options (CLG figures in brackets)	Greenfield use (ha)	Brownfield use (ha)*	Total land take (ha)	Additional greenfield use (%)
CLG Scenario 1 (20% greenfield)	(830) 890	(2,110) 2,196	(2,940) 3,086	-
CLG Scenario 2 (27% greenfield)	(1,120) 1,201	2,004	3,204	35
Variant Scenario 2.1 (48% greenfield)	2,135	1,427	3,562	140
Variant Scenario 2.2 (Scenario 2 + greenfield density 27dph)	1,290	2,004	3,293	45
Variant Scenario 2.3 (Scenario 2.1 + greenfield density 27dph)	2,293	1,427	3,720	158

* If the brownfield sites continued to become available but were not used for housing, the difference between current use (2,196ha) and implied use could become derelict land.

(ii) *Increase in dwelling supply*

2.32 CLG proposes a further Scenario 3 in which, by making more greenfield sites available, the total supply of housing is assumed to increase. Options of 1%, 2%, 3%, 4% and 5% increased output are offered, with all the additional housing on greenfield sites. This time, however, CLG uses the 10-year average densities on greenfield sites (27dpa) and brownfield sites (41dpa) rather than the 2009 densities, and also assumes that the baseline dwelling supply is 162,000 annually rather than the 2009 figure of 129,000 dwellings assumed in the baseline for Scenario 1. A "1%" increase in housing output is now 1,620 dwellings annually. On greenfield sites at 27dph these would occupy an extra 60 hectares annually. For every 1% increase assumed in total output, land take would rise by a further 60 hectares. (Table B3.2 significantly understates the land requirements from increasing total housing output in Scenario 3, which would be entirely on greenfield sites. The Table appears to have taken 27% of total extra output instead of 100% of it, perhaps because 27% is the proportion of housing assumed to be on greenfield land in Scenario 2. However, the purpose of making available the additional greenfield land in Scenario 3 is to encourage additional housing there: extra greenfields will not encourage extra development on brownfield land. The Table has also omitted the time period to which the impacts relate - presumably 'per year'.)

2.33 With only a small increase in overall output anticipated from the relaxation of development on greenfield sites (no more than 5% in the CLG scenario), it is clear that the

principal effect of the relaxation in planning terms would be to give developers more flexibility about where to develop (not to change how much is developed). This increases the uncertainty about which areas will in practice receive the development, and that in turn makes more difficult the task of the tying the necessary infrastructure (roads, schools, etc.) to the development built. This is the opposite of the claim in the *Impact Statement* that the ‘wider impacts’ of the proposals will necessarily be beneficial, and “should lead to better and more sustainable locations being developed and better mixes of land uses” (page 56).

(iii) *The two changes combined*

2.34 Scenario 3 in the *Impact Assessment* aspires to combine the above two changes by assuming both increases in overall output and a switch in the percentage mix of greenfield/brownfield provision from 20/80 to 27/73. However, in practice Table B3.2 fails to reflect the latter at all. This is remedied in Table 5 below. At an annual supply rate of 162,000 dwellings, an increase from 20% to 27% in the proportion on greenfield sites would in effect switch 11,340 dwellings from brownfield to greenfield. At 27dph these would occupy an additional 420 hectares. Table 5 shows the cumulative impact of adding this change to increases in overall dwelling provision.

2.35 Table 5 also shows as a further scenario the cumulative impact of a switch in the percentage mix of greenfield/brownfield provision from 20/80 to 48/52, which requires an additional 1,680ha of greenfield land in addition to the baseline requirement of 1,200ha.

Table 5 Greenfield land requirements under supply scenarios (based on CLG)

Assumed dwelling output growth from extra land supply	Total dwelling output assumed	Greenfield land requirement (hectares)		
		Scenario (a): extra output only, (baseline 20% greenfield devt)	Scenario (b): Scenario (a) plus 27% greenfield development	Scenario (c): Scenario (a) plus 48% greenfield development
Baseline	162,000	1,200	1,620	2,880
+1%	163,620	1,260	1,680	2,940
+2%	165,240	1,320	1,740	3,000
+3%	166,860	1,380	1,800	3,060
+4%	168,480	1,440	1,860	3,120
+5%	170,100	1,500	1,920	3,180

2.36 Table 5 shows that in addition to a baseline requirement for 1,200ha annually of greenfield land under the assumptions made, the principal impact on the requirement for additional greenfield land comes from the switch in output from brownfield to greenfield sites. This is more important than possible small increases in total output resulting from the ‘choice’ offered by a relaxation of planning policies. The figures for greenfield land requirements are massively larger than the very defective figures presented in CLG’s Table B3.2, which appear to suggest that under no reasonable circumstances would greenfield land requirements rise by more than 100 hectares per year.

2.37 The real greenfield land take, however, is likely to be greater than the Table 5 figures suggest. Under a scenario where greenfield sites are more readily available, the assumption can no longer be made that building densities on greenfield sites will be the same in future as they have been in the past. Additional land supply reduces the significance of land as a factor of production, and therefore builders value it less: evidence from periods with lesser density controls (and meaningful density controls are also proposed to be abandoned under the NPPF) is that landscaping and garden sizes take up more space in these circumstances. Back in 1989, a study at Reading University concluded that the effect of lifting local restrictions on housing development would be to increase average plot sizes by 65% (Cheshire, P. and Sheppard, S, *British planning policy and access to housing: some empirical estimates*, Urban Studies, vol. 26, pps. 469-485).

2.38 This issue is likely to become particularly relevant in view of the Government’s removal of minimum density standards from national planning policy, and the fact that development on greenfield land tends to be significantly lower density than that on brownfield (see above). A further study, by Entec for Defra in 2004, included an analysis of the rates of resource consumption involved in building 201,540 dwellings per year at low density (30 dwellings per hectare (dph)), medium density (60 dph) and high (100 dph) density. This found that 0.75 million tonnes of CO₂, and over 1 million tonnes of aggregates, could be saved every year by building at medium rather than low densities, and both figures are approximately doubled if building is at high compared with low densities. Current average residential density on brownfield sites is 43 dwellings per hectare, and according to Government figures this has increased over the time that minimum standards have been specified in national policy (see above). The *Impact Assessment* fails to consider increases in both CO₂ emissions and aggregates extraction arising from both increased greenfield development and a removal of national density standards.

2.39 The overall effect of relaxing land supply on greenfield sites is that marginal increases in housing supply might be achieved, but this is at the cost of a very substantially increased land take due to the preferential use of greenfield sites. Only modest switches are needed from brownfield site development to greenfield sites to have a big impact on greenfield land requirements, due to the lower densities achieved on greenfield sites, plus the likelihood that these would in future be still lower than in the past.

Conclusion on housing market impacts

2.40 The arguments used in the *Impact Assessment* of the draft NPPF to justify abandoning a brownfield first policy (and a percentage target for housing on brownfield sites) do not stand up to scrutiny. They indicate a lack of understanding of how the housing market works, a misunderstanding of the evidence on the availability of brownfield sites and their ongoing supply, reliance on misrepresentation of research evidence, and a failure to consider a wide range of potential adverse environmental impacts.

3 AN ENDURING SUPPLY OF BROWNFIELD LAND

3.1 Section 2 has demonstrated that the claim in the *Impact Assessment* accompanying the draft NPPF that “the brownfield land target would cease to be sustainable in the (high demand) southern regions by 2015-16” is completely unfounded. Nationally, both the amount of previously developed land suitable for housing and the numbers of houses capable of being built on it were at all-time highs in the most recent Government study for 2009. Far from brownfield land being ‘used up’, the new supply of this land - its replenishment - has for some years been exceeding the rate at which housing has been built on it.

3.2 This section examines in more detail the evidence on how and where previously developed land has come forward for redevelopment in the past and the prospects for it continuing to do so reliably in future. The section begins with an outline of the urban land recycling process. It then reviews the pattern on brownfield land recycling in the following ways:

- previously developed land available at the regional level;
- local authorities with high quality NLUD data;
- detailed local-level data in a case study local authority;
- housing supply in selected authorities which have virtually no greenfield land; and
- the contribution of garden land to housing supply.

Understanding urban land recycling

3.3 The enduring supply of brownfield sites can be a surprise to those unfamiliar with the way the land market works. Predicting the supply of sites cannot be achieved effectively by aerial survey, for instance. Urban capacity studies over many years have found that some property is recycled into new uses, but that the probability of this happening in any particular place varies according to the circumstances. Many sites come forward unexpectedly, either because they were too small to be worth the effort of attempting to identify in advance, or because the existing uses of individual plots were not expected to cease. These ‘windfall’ sites are an important part of the process of urban land recycling into new uses, whether for housing, commercial development, retailing or any other purpose. The number of plots which become available each year in an area is unpredictable, so it is not surprising that supply rates vary considerably over time. Supply will also vary from place to place, generally with more sites becoming available the older the urban fabric. Superimposed on this is the market interest in finding suitable sites for recycling: with high or rising land values, both existing owners and prospective builders will be keen to explore the possibility of moving land into higher-value uses. One of the main findings of an earlier report by CPRE on windfall sites (*Welcome Homes*, 1988) was that the amount of brownfield land recycling appeared to be a function of how keen the parties were to find sites. This has been echoed in the case study work done for this report, particularly in Stockport (see paragraph 3.37 below).

3.4 There is often some political doubt about the contribution to housing from previously developed land in general and windfall sites in particular. Some observers struggle with the principle of the probability - rather than cast-iron certainty - of urban land recycling continuing to take place. Politicians are often wary of claims that brownfield sites will come forward when the plots involved are not necessarily apparent. They can assume that reliance on windfall sites is an excuse by local planners to avoid allocating greenfield sites - which are more obvious and have a good chance of being developed. As a result, current as well as proposed policy generally prevents local authorities taking windfall sites into account in their housing supply plans for the first ten years of those plans (Planning Policy Statement 3, *Housing*, paragraph 59; draft NPPF, paragraph 109). This policy makes more difficult the prioritisation of housing development on brownfield sites, as it obliges local authorities to allocate more greenfield land than necessary.

Previously developed land available at the regional level

3.5 Two major databases provide highly relevant information annually to identify the amount of previously developed land (PDL) available for housing, used for housing and the numbers and proportions of dwellings built on it. These are the National Land Use Database

(NLUD) and the Land Use Change Statistics (LUCS). By combining them, data can be presented over the years by area and by numbers of dwellings, actual and potential, at the national, regional, county and district level. The data for each of the nine regions and for England are presented in Appendix 2 from 2001 to 2009.

3.6 There are inevitably limitations in the data, and the main ones are discussed in Appendix 3. The impact of these limitations on the presentation in the rest of this chapter is that the NLUD results for 1998 have been excluded. As there was no NLUD survey in 1999 or 2000, the tables begin in 2001. There was a weak response to the 2001 survey (37% of authorities did not provide data), and the ‘grossing-up’ process may contain errors, so figures for that year should be treated with particular caution.

(i) *Data on areas of PDL*

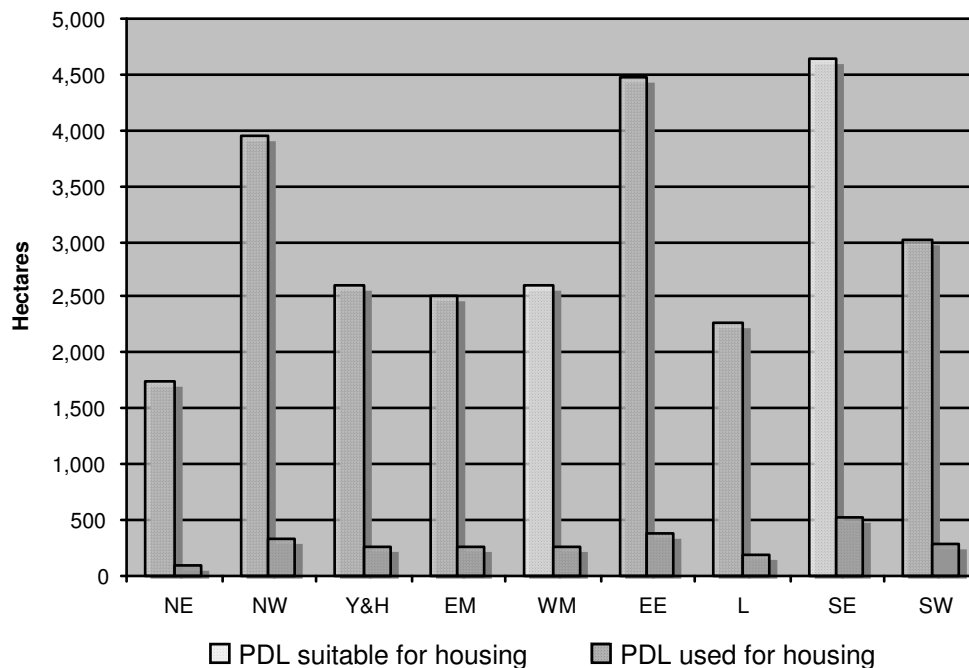
3.7 The area of PDL used for housing can be calculated from LUCS data. LUCS presents figures on the hectares changing to new residential use and the percentage of that which was previously developed land. The resulting area of PDL used for housing can be compared with the amount of PDL identified by NLUD that year as suitable for housing.

3.8 Beginning with the area figures for England as a whole (Table A2.10), some of the key features to emerge from Appendix 2 are:

- the importance of the housing market overall: the highest rate of use of PDL for housing during the decade was in 2007, immediately prior to the recession, which was the year the greatest number of new dwellings was built; in the following recession years of 2008 and 2009 the use of PDL (and the area changing to residential use) dropped sharply, reflected in all regional figures;
- the rising percentage of residential development taking place on PDL: this increased every year from 2001 to 2008;
- the area of land changing to residential use fluctuated over the years, on a slightly downward trend: this was despite the number of dwellings built increasing year on year until the recession hit after 2007, demonstrating the reduced need for land due to the higher densities achieved; and
- the consistency of the PDL available and suitable for housing: until the recession, when the supply peaked, the minimum annual supply had been only 9% below the maximum supply, clearly demonstrating the ongoing supply of fresh PDL to replenish the area used for house building.

3.9 Most of these features are reflected in the regional figures, though in all cases with greater annual variation and less consistent trends at that scale. The regional data also show that the various figures peaked in different years. For example, the amount of PDL available and suitable for housing was comfortably at its highest level in the most recent recession year in both the North West and London, but at its lowest level in the West Midlands that year. Furthermore, some of the highest and lowest figures can be found in consecutive years in the regional figures, suggesting that caution should be used in relying on data from any individual year. With this in mind, Figure 1 charts the average area of PDL used annually for housing in each region over the nine year period alongside the average area of PDL available and suitable for housing. This removes the effect of short term local determinants of supply, although at the same time it necessarily removes the effect of market variations of boom and bust during the decade. The data used in Figure 1 show that in all regions there was at least 8.7 years’ supply of PDL (at its average rate of use).

Figure 1 PDL suitable and used for housing (annual average 2001-09) (ha)



3.10 Table 6 presents the rate of replenishment of PDL across the study period. It shows that five regions had more PDL available and suitable for housing in 2009 than they had in 2001, while four regions had less. On average across England there was more land available in 2009. No region shows a persistent decline in the area of suitable PDL available for housing. The rate of supply of new PDL suitable for housing across all regions, averaged over time, is much the same as the rate at which it is built on. Nowhere is there any indication that PDL for housing is 'running out' in terms of its usage in relation to its availability. The area-based data therefore demonstrate an enduring supply of PDL for housing, within a framework of fluctuation from one year to another.

Table 6 Replenishment of PDL suitable for housing by region 2001-09 (ha)

Region	PDL available in 2009	PDL available in 2001	PDL gain/ (loss) 2001-9	Use of PDL for housing 2001-9	Replenishment of PDL 2001-9
North East	2,030	1,740	290	919	1,209
North West	5,110	3,950	1,160	2,959	4,119
Yorkshire and the Humber	2,420	2,510	(90)	2,433	2,343
East Midlands	2,770	2,910	(140)	2,311	2,171
West Midlands	2,120	2,610	(490)	2,273	1,783
East of England	4,290	4,480	(190)	3,356	3,166
London	3,580	2,470	1,110	1,809	2,919
South East	5,410	4,750	660	4,784	5,444
South West	3,430	2,640	790	2,492	3,282
ENGLAND	31,160	28,060	3,100	23,368	26,468

Sources

- PDL available for housing: NLU D
- PDL used for housing: derived from CLG Live Tables P222 and P224

(ii) *Data on dwellings on PDL*

3.11 The numbers of dwellings built on PDL can also be calculated from LUCS data. The calculations start with Government figures for all dwelling completions (excluding conversions). LUCS includes annual data on the percentage of dwellings built on PDL. Multiplying these figures for each year gives numbers of dwellings built on PDL. That can then be compared with the numbers of dwellings estimated by local authorities in the NLUD survey as capable of being built on the PDL available.

3.12 Beginning again with the area figures for England as a whole (Table A2.10), some of the key features to emerge from the tables in Appendix 2 are:

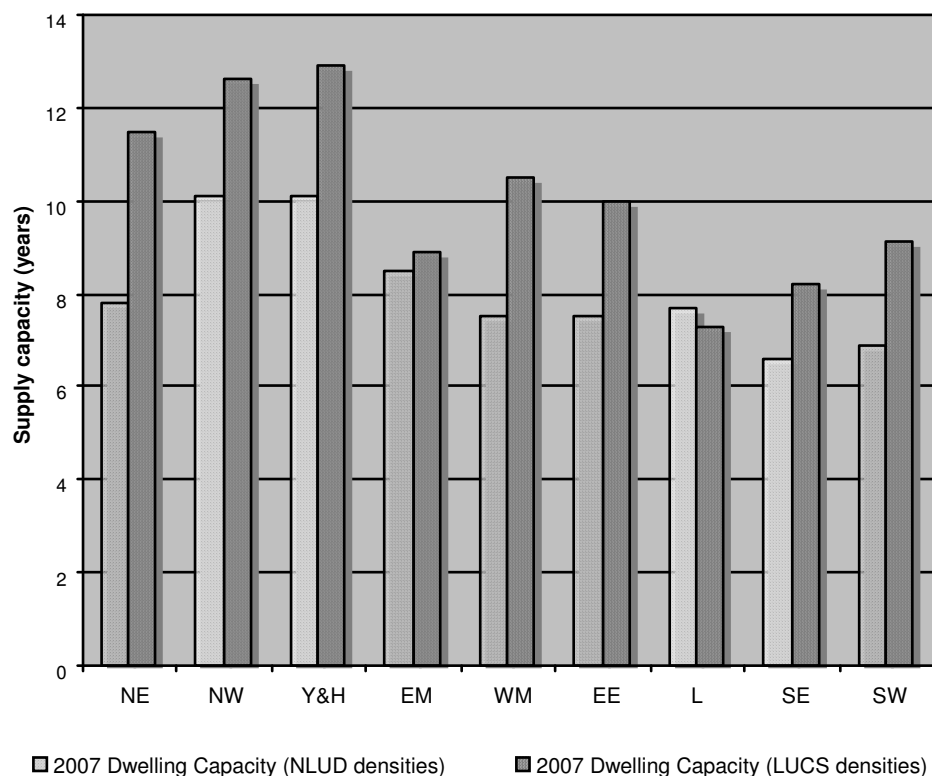
- dwelling completions rose year-on-year from 2001 to 2007, but fell away sharply in the recession after that;
- dwelling completions on PDL also showed a strong upward trend to 2007;
- the percentage of dwellings built on PDL showed a strong upward trend over the period too;
- actual dwelling densities on PDL increased sharply early in the decade but rose only slightly thereafter;
- anticipated dwelling densities on PDL available and suitable for housing rose to catch up with current practice by the end of the study period; and
- the number of dwellings anticipated on PDL that was available and suitable for housing rose during the period, especially after 2006, largely reflecting the higher densities then assumed.

3.13 Between 2003 and 2008 the actual density of housing development on PDL was at least 7 dwellings per hectare greater than assumed by local authorities on the PDL available and suitable for housing. There may have been good reasons for this, but the implication is that there may have been some understatement in those years of the number of dwellings which might be achievable on PDL suitable for housing. Comparing the beginning and end of the study period, when actual (LUCS) and assumed (NLUD) densities were more in line with each other, avoids the possible problem, but there may be some unreliability in using the trends in NLUD data during the period on densities and dwelling capacities. It is also important to note that the average density of new housing across England recorded by LUCS, ranging from 28 dph in 2001 to 47 dph in 2009, is low to medium rather than high density in typically understood terms (for more on density see Chapter 4 below).

3.14 Regional figures again show greater variation than national ones (as is to be statistically expected). Nonetheless, regional figures followed those for England in that dwelling completions and dwellings built on PDL peaked in 2007 in all but two regions. Actual densities achieved on PDL peaked in six regions in 2007, a year earlier than nationally: the national data were affected by the exceptionally high densities in London during the recession. The differences between actual and assumed densities on PDL stand out in the regions. Assumed densities (especially after 2002) were persistently below actual densities in the North East, West Midlands, East of England, South East and South West, though conversely in the other four regions assumed densities were usually well above actual densities by 2009.

3.15 The dwelling densities assumed by NLUD on PDL suitable for housing have an important impact on the estimated dwelling capacity. Assumed densities can be significantly different from the actual densities recorded by LUCS. The estimated number of plots available on PDL can therefore be in error. The sufficiency or otherwise of supply of PDL is therefore more prone to error in respect of dwelling numbers than in respect of hectares. The dwelling data show more pronounced trends than the area data, so taking averages of the figures over the period 2001-09 would be misleading. Additionally, the most recent figures for 2009 are heavily affected by the recession: with building rates so low, the capacity figures for PDL would suggest unduly large supplies of PDL available for housing in relation to requirements.

Figure 2 Dwelling capacity on PDL in 2007 (years)



3.16 Taking all these difficulties into account, Figure 2 shows for 2007 (the last pre-recession year) the capacity of suitable PDL as a multiple of dwellings built on PDL that year. This is provided first using NLUD's capacity figures based on its own assumptions about dwelling density on that land, and second using those figures factored by the difference between assumed (NLUD) and actual (LUCS) density of supply in 2007. The data are presented as number of years' supply.

3.17 Figure 2 shows that regionally, on NLUD's capacity estimates, there were between 6.6 and 10.1 years' supply of plots on PDL at the rate of building in 2007 (the peak year in most regions). If the actual LUCS densities achieved in 2007 are applied to the NLUD data, the range changes to 7.3-12.9 years' supply. This is effectively a 'worst case scenario' in that there is little sign of a return to 2007 rates of building, while in many regions the supply of PDL suitable for housing has increased rather than decreased. Performing the same calculation on current data would show the capacity of PDL to meet housing requirements to be significantly greater. (The area and dwelling graphics are not compatible because Figure 1 with area data uses an average of 2001-09 while the dwelling data in Figure 2 uses a base date of 2007.)

3.18 Table 7 presents the rate of replenishment of PDL for dwellings on the same basis as Table 6 did for hectares. It shows that in all regions the number of dwellings capable of being built on PDL was more - often very substantially more - in 2009 than in 2001. The overall findings are heavily affected by the substantial gains in the North West and in London, (in the latter case due in large measure to an extraordinarily high density assumption of 126 dwellings per hectare). PDL could provide more than half a million additional dwellings in 2009 than it could in 2001, according to NLUD. At the same time approaching one million dwellings were built on PDL over the nine year period, so the replenishment of PDL was sufficient for the supply of around 1.5m dwellings. This is a rate of replenishment 60% faster than the rate at which dwellings were built on PDL over the study period. The principal explanation for this surplus is the increasing density of housing supply on PDL over the study period.

Table 7 Replenishment of PDL suitable for housing by region 2001-09 (dwellings)

Region	PDL available in 2009	PDL available in 2001	PDL gain 2001-09	Use of PDL for housing 2001-09	Replenishment of PDL 2001-09
North East	66,090	48,800	17,290	36,120	53,410
North West	265,230	138,400	126,830	119,074	245,904
Yorkshire and the Humber	113,380	95,300	18,080	85,896	103,976
East Midlands	98,370	79,600	18,770	77,207	95,977
West Midlands	84,350	71,300	13,050	90,169	103,219
East of England	125,780	109,800	15,980	109,264	125,244
London	452,110	149,200	302,910	166,178	469,088
South East	179,780	119,300	60,480	169,109	229,589
South West	109,030	107,400	1,630	91,820	93,450
ENGLAND	1,494,070	919,100	574,970	942,410	1,517,380

Sources

- PDL available for housing: NLUD
- PDL used for housing: derived from CLG Live Tables 217 and P212

3.19 Table 7 shows that all regions experienced an increase between 2001 and 2009 in the number of dwellings they could supply on PDL. This is in addition to sufficient PDL coming forward to replace the PDL built on. Far from PDL for housing 'running out', it has the capacity to supply an increasing number of dwellings, provided medium (around 40 dph) densities are maintained across England. The dwelling-based data therefore demonstrate not only an enduring supply of PDL for housing but a surplus which is substantial in many regions. That finding remains robust even allowing for some overstatement of the position in 2009, due to a particularly large supply of PDL being available in some regions in the recession.

Local authorities with high quality NLUD data

3.20 The smaller the geographical area studied, the greater the variation in data on PDL and the less clear the trends. The analysis above has shown that the national data are not masking variations at the regional level to any great degree, but it is still possible that regional data may be masking local variations. Perhaps those authorities where the need for housing supply is greatest are the ones with the least ability to make available PDL for its provision? To address this issue, an assessment has been carried out of the availability of PDL and its replenishment at the local authority level in two regions: the North East and the South East.

3.21 This review has in itself raised a concern, in that under current Government proposals local authorities will no longer monitor the amount of housing being built on greenfield or brownfield land, or at a particular residential density, in the same detail as in the last decade. If reliable information is unavailable it would be much more difficult to measure progress against what is still, at present, a Government indicator of sustainable development.

3.22 Appendix 3 explains that the North East and the South East are the two regions with persistently the highest rate of returns from local authorities, so that the process of 'grossing-up' to an estimate of the full authority figures is kept to a minimum in these regions, (see paragraph A3.6) There were no local authority level data published in 2009 and in 2001 the scale of the NLUD returns was relatively poor and comparable dwelling completions data are unavailable (see paragraph A3.9). As a result, the local authority analysis is limited to the period 2002-2008. In some authorities non-responses in some years have complicated the trend analysis, so that the period of analysis has in some cases been shortened, in the case of Gateshead to the extent that this authority has been omitted from assessment completely (even though it provided almost a 100% response in 2008).

3.23 Tables have been prepared for each local authority in both the North East and South East showing the availability and use of previously developed land for each year from 2002 to 2008. Table 8 provides an example, in this case for Darlington (alphabetically the first in the North East). Here there were insufficient data (in 2002) to complete the table, so the analysis covers the period 2003-08 only. The table provides information not only on 'All previously developed land' in the authority, but 'all suitable for housing' (ASFH) plus a further category which excludes the supply on 'permitted and allocated' (P&A) sites (see Appendix 3 paragraph A3.10). Annual information on the area of PDL available (in the three categories) enables the change in supply between the first and last years of the period to be calculated. Table 8 also shows the total number of dwellings built, the total built on PDL and the total area of PDL occupied over the period. So far as the availability of PDL is concerned, it is the most recent figures available which are most important, but the change from the start of the analytical period does give an insight into replenishment. In the case of Darlington, for example, the 2008 data show that there were 54ha of PDL suitable for housing, excluding permitted and allocated land, compared with an annual use of PDL which was under 10ha annually during the period. Darlington therefore still has considerable PDL available for housing. The replenishment of PDL over the period can be calculated from the area at the beginning and end of the analytical period, allowing for the area of PDL used for housing⁷.

Table 8 PDL used for housing in Darlington⁸

Year	Type of PDL (1)	Available PDL (ha) (1)	Dwellings built (2) (excl. conversions)	Dwellings built on PDL (%) (3)	Dwellings built on PDL (no.) (4)	Dwelling density (dph) on PDL (5)	PDL occupied by housing (ha) (4)
2002	All PDL	212	n/a	54		31	
	ASFH	48					
	ASFH exc. P&A	43					
2003	All PDL	181	390	73	285	43	7
	ASFH	71					
	ASFH exc. P&A	58					
2004	All PDL	158	510	73	372	43	8
	ASFH	54					
	ASFH exc. P&A	45					
2005	All PDL	143	530	73	387	43	9
	ASFH	43					
	ASFH exc. P&A	32					
2006	All PDL	148	380	73	277	43	6
	ASFH	44					
	ASFH exc. P&A	36					
2007	All PDL	148	390	48	187	41	5
	ASFH	44					
	ASFH exc. P&A	36					
2008	All PDL	197	160	48	77	41	2
	ASFH	76					
	ASFH exc. P&A	54					
Totals 2003-08		N/A	2,360	67	1,585	43	37

⁷ This is calculated by subtracting the starting hectareage from the final hectareage and adding in the amount of PDL used for housing: 54 minus 58 plus 37 equals 33 in the case of ASFH exc. P&H 2003 to 2008. This shows that replenishment was just short of the use of PDL over the period 2003-08.

⁸ Sources (the following numbers refer to header row in the table): 1: NLUD annual reports; 2: CLG Live Table 253 (financial year applied to calendar year); 3: CLG Live Table P213; 4: From previous two columns; 5: CLG Live Table P232

3.24 From comparable tables to Table 8 prepared for all authorities in the North East and South East, the replenishment rates across each region can be established at the local authority level. The summary table for the North East is set out in Table 9 below. That for the South East is included as Appendix 4 due to its size.

3.25 Table 9 shows that in most authorities in the North East the replenishment rate of PDL has exceeded the rate at which it has been used over the years to 2008, sometimes by spectacular amounts. Only in North Tyneside and to some extent South Tyneside has replenishment not kept up with the rate of housing development on PDL. Even here, though, there is not a short term impediment to the use of PDL for housing. In North Tyneside 25ha of PDL were used for housing over the six years to 2008, and the amount of PDL available and suitable for housing was 25ha in 2008, i.e. about six years’ supply, though down from 39ha in 2003. South Tyneside had 78ha of PDL available and suitable for housing in 2008 compared with an annual average use of PDL of under 6ha annually over the previous five years, in other words ample supply. However, as the stock of PDL had been 98ha in 2004, the limited replenishment is clearly apparent. The evidence from the North East region is clearly that there is no shortage of PDL suitable for housing in local authorities, and that in most of the region the rate of replenishment has been comfortably in excess of the rate at which it has been used. There is no indication that brownfield sites are ‘running out’ in these authorities.

Table 9 Use and replenishment of PDL in North East local authorities

Authority	Analysis period	Dwellings built on PDL	PDL used for housing (ha)	Replenishment of PDL (ASFH) (ha)	PDL (ASFH) in 2008 (ha)	Replenishment of PDL (ASFH exc. P&A) (ha)
Darlington	2003-08	1,585	37	32	76	33
Hartlepool	2002-08	658	26	95	82	83
Middlesbrough	2002-08	1,267	28	166	143	92
Newcastle-upon-Tyne*	2002-08	>1,408	>17	>248	264	>170
North Tyneside	2003-08	1,292	28	11	25	6
Redcar & Cleveland	2002-08	1,260	40	75	50	68
South Tyneside	2004-08	1,306	28	8	78	33
Stockton-on-Tees	2002-08	2,391	75	323	269	329
Sunderland	2002-08	3,514	104	389	393	210

Source: Derived from local authority tables generated from NLUD and LUCS (see Table 8 and footnotes)

* Dwelling supply figures missing for 2003 and 2004

3.26 The evidence from the South East is slightly different (see table in Appendix 4). In 43 authorities replenishment exceeded the use of PDL; it was identical in 3 authorities and less in 18 authorities. Most authorities have ample supplies of PDL to continue rates of provision in recent years, but some do not. In some cases the table gives the impression that PDL has virtually run out and is wholly insufficient to sustain recent rates of housing development on such land: see for example Mole Valley (with 1 hectare available in 2008 despite developing 68ha of PDL in the period 2002-08), Test Valley, Tandridge and West Oxfordshire.

3.27 These data must be put in perspective by the data on replenishment rates. In each of the four cases indicated, and in other less pronounced cases such as Rother, Surrey Heath, Winchester and Woking, the replenishment of PDL over the analysis period was almost exactly the same as its use. Therefore, even though the stock of PDL is low (sometimes very low), newly arising PDL is quickly recycled into new housing. In these authorities the impression is that whatever PDL becomes available is built on. This tends to be supported by the evidence from NLUD that these authorities have never had large amounts of PDL available (e.g. 6ha was the most ever available in West Oxfordshire and just 3ha in Mole Valley). There is a possibility that the build rate in these authorities depends on the speed at which PDL becomes available. This may well be the case in the constrained Green Belt authorities such as Mole Valley and Tandridge in Surrey, both of which have achieved 89% of their house building on PDL, but is much less true of Test Valley and West Oxfordshire where greenfield sites are more readily available and PDL supplies only 63% and 35% of housing land respectively.

3.28 The data therefore illustrate the importance of 'windfall' sites - not specifically anticipated, and for which there is no time to allocate them in a plan before they are used. Windfall sites enable authorities with an apparent dearth of PDL nonetheless to continue supplying dwellings. This can arise on a substantial scale. For example, in the seven years from 2002 and 2008 100 hectares of PDL was used for housing in East Hampshire. This authority had apparently little more than a year's supply available in 2008 (23ha), yet the rate of replenishment of PDL suitable for housing exceeded the 100 hectares used over the same period.

3.29 The evidence from the South East confirms the great significance of previously developed land in meeting housing needs in the region. Not only is it widely used to provide large proportions of authorities' total dwelling supply, but it continues to be replenished - often in excess of the rate at which it is used. The impression from the data on 'stocks' of PDL that in a handful of authorities supplies are running out is seriously misleading when examined against the 'flows' of PDL: windfall sites have demonstrated a striking ability to sustain output in many authorities in the region. Only in the most constrained locations, where greenfield development would involve breaching major policy constraints such as the Green Belt, is housing supply apparently tied to the rate at which new PDL becomes available. That does not amount to a reason to abandon a policy of encouraging development on brownfield first before greenfields. Rather, it may point to the completely reverse conclusion - that a strong brownfield first policy, including scope for local authorities to make allowance for windfalls in their forward housing land supply, forms a critical part of any commitment to maintain protection of the Green Belt and other areas of countryside.

Local authority case study

3.30 In addition to evaluating statistical information at national and regional levels and for a selection of local authorities, a case study local authority has been studied in more depth. The objective was to select an authority which would illustrate whether or not a policy of promoting the development of brownfield sites before considering greenfield sites was effective. To be convincing, the local authority needed to have:

- operated a 'brownfield first' policy for some years;
- very good data on housing supply on greenfield and brownfield sites (distinguishing also new construction from conversions and dwelling re-use);
- greenfield sites available if necessary to meet housing requirements; and
- pressure of market demand.

3.31 The authority selected was Stockport Metropolitan Borough Council (MBC) in Greater Manchester. There is considerable pressure for housing development in Stockport, which has a relatively buoyant housing market and the second-highest house prices within Greater Manchester. However the Manchester Green Belt constrains outward development and local planning policy protects open land within urban areas (e.g. parks, playing fields, allotments, landscaping within residential areas) from inappropriate development. Therefore the option of greenfield development is usually awkward in planning terms, but physically remains an option if insufficient plots come forward on brownfield sites.

3.32 Stockport MBC has long had a planning policy to encourage building on 'brownfield sites first'. The current policy is set out in Stockport's Core Strategy 2011 which includes as one of its seven objectives for housing: "Focus new housing on previously-developed land to assist regeneration where possible". Policy CS4 *Distribution of Housing* includes the commitment that "The focus is on making effective use of land within accessible urban areas. The priority for development is therefore previously developed land within urban areas. Urban Greenfield and Green Belt development should accord with the following sequential approach....".

3.33 The rate of house building in Stockport peaked at 761 dwellings in the year prior to the current recession, against a target annual supply of 450 dwellings. Despite this high rate of supply and the greenfield constraints, previously developed land has continued to come forward to facilitate building to the extent that in most years well over 90% of all dwelling supply has been on PDL rather than greenfield sites. The details are given in Table 10.

Table 10 Housing land supply and use of PDL in Stockport 2000-2011

Year	*Supply from permitted and allocated sites	Supply on sites under construction	Total supply at start of year	Dwellings completed (gross)	Completions on PDL (%)****	Dwellings lost
Jul-2000-Mar 01	1,393	492	1,885	**277	72	21
Apr 2001-Mar 02	1,257	421	1,678	331	98	35
Apr 2002-Mar 03	1,201	433	1,634	153	97	137
Apr 2003-Mar 04	1,435	504	1,939	348	99	15
Apr 2004-Mar 05	1,723	525	2,248	419	84	14
Apr 2005-Mar 06	2,681	570	3,251	514	99	25
Apr 2006-Mar 07	2,860	330	3,190	761	98	20
Apr 2007-Mar 08	2,113	958	3,071	717	96	85
Apr 2008-Mar 09	1,649	1,005	2,645	445	98	50
Apr 2009-Mar 10	2,374	828	3,202	194	99/96	22
Apr 2010-Mar 11	1,893	663	2,556	203	93	16
Apr 2011-Mar 12	1,753	779	2,532	***170	***90	n/k

Notes

* Covers short term supply sources only (available within the next five years). The vast majority of these sites had planning permission.

** 9 month period

*** Projected figures; (the Council advises that the percentage of housing on PDL should rise to 97-98% in the period 2012-16 as the construction rate picks up out of the recession)

**** % of dwellings on PDL uses revised PPS3 definition from 2009/10 onwards; first 2009/10 figure of 99% uses old PDL definition, second figure of 96% uses revised definition (excluding gardens).

3.34 Table 10 shows that the building rate has never been obviously constrained by the supply of sites. With typically 2-3,000 plots available in the short term, gross land supply only fell below five years at the current building rate in the last two years of the boom (April 2006 - March 2008), but even then was much larger than five years' supply at the 450pa policy rate of building. This level of land supply, formally between 5.5 and 7 years' supply from 2005 onwards, suggests that there was little to impede the house building companies from higher rates of construction if they judged that the market could have supported that. Plummeting building rates in the recession, to around 200 dwellings annually, cannot possibly be explained by a shortage of suitable land in Stockport. Allocating more land would seem to be an irrelevant response to the decline in house building.

3.35 In the 10 full years 2001-02 to 2010-11, 4,085 dwellings were built, of which 3,923 were on previously developed land (96%). (The net supply was 398 dwellings fewer over the same period, fractionally depressing the percentage for overall supply on PDL.⁹)

3.36 At the start of the 10 year period in April 2001 there was land available for building 1,678 dwellings. Ten years later there was land available for building 2,532 dwellings. In the interim 162 dwellings had been built on greenfield sites and 3,923 gross (3,525 net) on PDL. From these figures can be shown that over the ten year period newly available PDL appeared for supplying 4,379 dwellings net. Far from being used up, PDL was plentiful.

3.37 It is clear from this case study that house building rates have reflected the state of the market (e.g. with a continual rise in dwelling supply from 2002 to 2007 and a reduction in the recession thereafter). With land supply generally offering 2,000-3,000 plots at any one time for short term use, almost all of it brownfield land, the data suggest that PDL becomes available when it is needed: it peaked in 2005-06 but has fallen back slightly in the recession. The impression is that, to some extent, the supply of PDL is a matter of how hard developers are looking for it (see paragraph 3.3 above). At no point in the last 10 years has the supply of PDL fallen to a point at which greenfield sites needed to be considered for use on any scale, so the policy of 'brownfield first' has not only worked but been fairly easy to apply.

3.38 The authority's Strategic Housing Land Availability Assessment (SHLAA) 2010 reports that between 2003 and 2008 housing developments on windfall sites provided 2,043 dwellings, representing over 90% of supply. Looking ahead, current and proposed Government policy (see paragraph 3.4 above) generally prevents local authorities making an allowance for housing likely to come forward on windfall sites until beyond the first ten years of a development plan. Prioritising brownfield sites, to the extent that these are windfall sites, will become more difficult in future under the new policy. Nonetheless, due to existing permissions, the SHLAA expects at least 81% of dwellings still to be supplied on windfall sites in the first five years of the plan, and, of course, many more windfall sites will be permitted and developed if past trends continue. Windfall sites have clearly made a major contribution to Stockport's housing supply, and there is no obvious reason why that should not continue.

3.39 The Stockport case study shows that the 'brownfield first' policy, including encouragement for the use of windfalls, can be strikingly successful. Even in locations with buoyant housing markets there can be a sufficient ongoing supply of previously used land to avoid the need to build on protected greenfield sites, whether within the urban fabric or beyond. The supply of PDL in Stockport depends heavily on the use of windfall sites, suggesting that constraining the ability of the local authority to make full allowance for this source, as PPS3 does at present (see paragraph 3.4) risks having the effect in due course of obliging the authority to allocate Green Belt land for housing even though it is not needed.

Housing supply in authorities with virtually no greenfield land

3.40 What happens to housing supply in local authorities which are essentially wholly built-up and have virtually no 'greenfield' land available for development? If the argument was correct that brownfield sites are 'used up', and the supply of PDL is largely a fixed and static resource to be used, then the expectation would be that dwelling supply would decline markedly and such areas soon be treated as 'full up'. To examine whether this is the case, this study examined dwelling supply in the Inner London authorities.

3.41 Every year in Greater London around 20,000 additional dwellings are built. CLG data are available on dwelling supply at the Borough level back to 2002-03, and local planning authority Annual Monitoring Reports are mostly available from 2004. The vast majority of dwellings are built on previously developed land (reaching 97% in the most recent year for which confirmed figures are available, 2009, according to the CLG, Live Table P212). This is clear evidence of the recycling of previously used land into housing on an enduring basis.

⁹ 162 dwellings were built on greenfield sites over the 10 year period (4,085 minus 3,923). Dwellings lost were 398, reducing the supply from 4,085 gross to 3,687 net. 162 represents a 4.4% net supply rate on greenfield sites compared with a gross supply rate of 4.0%.

Numbers of dwellings completed vary from year to year, but there is little to indicate that the supply of land for housing is running out, and planning policies for new housing supply assume continued provision.

3.42 Inner London authorities provide thousands of houses each year, strongly indicating that land can be recycled into housing even where greenfield sites are in exceptionally short supply - the option of building even on the Green Belt does not exist, for example - and where most Borough Councils have strong policies to resist the erosion of green spaces. Table 11 shows that in these authorities 100% of houses are often built on previously developed land.

Table 11 Dwelling completions and use of PDL in Inner London Boroughs

London Borough	Dwelling completions*								Dwellings on PDL %**	
	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2003-2006	2007-2010
Camden	N/A	500	400	N/A	N/A	260	480	170	96	100
Greenwich	1,410	1,580	1,070	1,130	N/A	870	600	1,110	98	97
Hammersmith & Fulham	80	280	130	N/A	N/A	90	530	20	100	90
Islington	N/A	170	380	740	840	620	900	160	100	93
Kensington & Chelsea	270	120	80	140	60	40	150	N/A	100	100
Lambeth	N/A	550	660	940	440	N/A	N/A	1,110	94	100
Lewisham	480	N/A	N/A	970	1,130	200	670	820	96	99
Tower Hamlets	1,490	2,950	1,920	1,900	1,330	2,350	2,930	4,220	100	100

Source:

* CLG Live Table 253 (provisional figures for 2003-04)

** CLG Live Table P213

Note: Insufficient data available from other Inner London Boroughs (Hackney, Haringey, Newham, Southwark, Wandsworth, Westminster)

3.43 There is considerable evidence to suggest that the Government’s figures on the percentage of housing completions on previously developed land understate the true position. Taking the four year period 2007-2010, the Annual Monitoring Reports issued by the Inner London Boroughs show that:

- in Islington 100% of houses were provided on previously developed land for all years between 2004-05 and 2009-10 inclusive (not the 93% indicated by CLG);
- in Hammersmith & Fulham 100% of houses were provided on previously developed land for all years between 2004-05 and 2009-10 inclusive (not the 90% indicated by CLG); and
- in Greenwich 100% of houses were provided on previously developed land for all years between 2006-07 and 2009-10 inclusive (not the 97% indicated by CLG); and
- in Lewisham there were two small scale uses of greenfield sites, with the construction of 37 dwellings in Deptford Park in 2007-08 and a further 10 houses on playing fields in Forest Hill in 2008-09, accounting for the 1% use of greenfield sites in the period 2007-10 as recorded by CLG.

3.44 Aside from the occasional sites in Lewisham, therefore, annual planning monitoring reports show that the entirety of all housing in Inner London was provided on previously developed land (in authorities for which data are usually supplied). Previously developed land is not ‘running out’ even in these extremely tightly constrained areas. This does not support the claim in the *Impact Assessment* of the Draft NPPF that “under plausible assumptions, the brownfield land target would cease to be sustainable in the (high demand) southern regions by 2015-2016.” Far from not achieving a 60% target, the Inner London Boroughs appear confident that they will usually achieve 100%.

The contribution of development on garden land to housing supply

3.45 In June 2010 the Government removed gardens from the definition of previously-developed land, in PPS 3 *Housing*, to give councils and communities more power to prevent inappropriate housing development in large gardens (with or without the demolition of the existing dwelling on a site). Concern had been expressed in the last Parliament and in the Coalition agreement for the current Government about the adverse impact that such garden development was having in some cases on the character of existing residential areas. The worry was that prioritising brownfield sites was having the unintended consequence of changing the character of existing residential areas by encouraging housing development within large gardens.

3.46 The evidence of a problem in this respect, often called 'garden-grabbing', was based on personal experience. No data have been collected systematically across the country on the extent of garden usage for new housing development. Other data have been called upon in support of the case for action, notably in August 2010 when CLG claimed that the annual Land Use Change Statistics that it was publishing at that time revealed the extent of the practice. The figures relied upon were those showing the proportion of new homes built on previously developed residential land, which increased from 11% in 1997 to 25% in 2009. These figures do not distinguish dwellings built on domestic gardens from those built on other residential land.

3.47 The previous Government undertook a survey of all local authorities in England and asked Kingston University to analyse the returns. The resulting report *Garden developments: understanding the issues - An investigation into residential development on gardens in England* was published in January 2010. The response rate to the questionnaire was only 35%, but based on these the report concluded that the use of garden land for housing was geographically skewed, notably to the South East region. There it contributed close to 30% of all new dwellings, whereas in other regions no figure significantly exceeded 10%.

3.48 There were significant limitations in the data and its analysis, suggesting that the supply figures provided should be viewed as maxima. As a starting point, the study found that very few authorities had a definition of garden land in their policies and that there was variation amongst them in their understanding of what it covered. The research also found that over the study period 2003-08 there had been no significant change in the amount of housing provided on garden land, somewhat calling into question the claim made by CLG in August 2010.

3.49 Definitive statistics on the incidence of garden development for housing, using a common definition across the country, is to be collected from now on, and will be available for the first time in the Land Use Change Statistics for 2011¹⁰.

¹⁰ LUCS 2010 Provisional, footnote 10

3.50 Few local authorities have housing supply data in sufficient detail to identify garden land development in recent years, but one which does is Stockport MBC in Greater Manchester. The authority also has detailed proposals for future development in this and other categories. Table 12 below provides a breakdown of the 1,893 dwellings for which land was allocated or permission given at April 2010. The definition of brownfield sites used by the authority reflects the revised definition in PPS3 Annex B. The authority’s Category 2 covers housing supply in gardens where the existing dwelling remains, and Category 3a housing supply in gardens in association with the demolition of the existing dwelling. These sum to 66 dwellings, representing 3.5% of the 1,893 dwellings already identified.

Table 12 Housing land supply in Stockport by category, April 2010

Category	Type of Site	No. of sites in category	Gross total
0	Retail and Leisure	5	312
01	Previously developed vacant sites and buildings (non housing)	36	1,263
02	Intensification of existing housing areas (i.e. gardens)	25	30
03	Redevelopment of existing housing		
03a	<i>Demolition of existing housing and erection of new housing</i>	20	36
03b	<i>Subdivision of existing housing (e.g. flat conversions)</i>	13	28
04	Redevelopment of car parks	0	0
05	Change of use of commercial buildings (small scale e.g. flat above shop)	35	87
06	Review of other existing allocations in plans	0	0
07	Vacant land not previously developed	2	7
08	Land currently in employment use	5	107
09	Allotments	0	0
10	School Playing Fields	0	0
11	Sports Pitches	0	0
12	Other Open Spaces	0	0
13	Community buildings (Educational and Religious)	1	20
14	Barn conversions	3	3
Total		145	1,893

Source: *Stockport’s 5 year supply of deliverable land for housing for the period 2010-15*, April 2010, Stockport MBC.

3.51 Stockport is an area under considerable development pressure and great constraint on greenfield development due to the Manchester Green Belt, requiring the local planning authority to rely heavily on the use of windfall sites. In these terms it is reasonably comparable to a number of local authorities in South East England. However, the contribution to development from ‘garden grabbing’ in Stockport is very small. Furthermore, the authority’s SHLAA anticipates little reliance on this already minor source of supply: 103 dwellings in these two categories in the first five years of the SHLAA (4.3% of supply) , 57 in years 6-10 (1.4% of supply) and the supply absorbed into the wider windfall category in years 11-15.

3.52 This low rate of anticipated use of gardens comes despite the authority’s own LDF Core Strategy Policy CS4 *Distribution of Housing* which gives some priority to using this type of land. The sequential approach in this policy (see paragraph 3.31) includes as the first two of the four sources the following priorities:

- “• firstly, the use of accessible urban sites that are not designated as open space, or considered to be areas of open space with amenity value;
- secondly, the use of private residential gardens in accessible urban locations where proposals respond to the character of the local area and maintain good standards of amenity and privacy for the occupants of existing housing, in accordance with Development Management Policy H-1 ‘Design of Residential Development’.”

Even though Stockport MBC is giving some priority to the appropriate intensification of housing development on garden land, the contribution from this source remains minor and is projected to decline.

3.53 The forthcoming LUCS information will indicate the scale of 'garden grabbing', but it is clearly a minor contribution to housing supply in Stockport (whether classified as brownfield or greenfield), despite the buoyancy of the housing market and the pressure which there could be for such schemes. Based on this it is unclear at present as to whether garden-grabbing should be considered a significant issue in the evaluation of urban land recycling.

Conclusion

3.54 The evidence available of an ongoing supply of previously developed land contributing to new housing supply all around the country is overwhelming. National, regional and local authority figures demonstrate this, with rates of replenishment often greater than the rate at which brownfield land is built on. Housing development continues to take place on a significant scale in Inner London, where there are effectively no greenfield sites available. In a case study of Stockport, where the pressure of development is considerable but the local authority is resisting greenfield development both peripherally on Green Belt land and on urban green spaces, there remains ample previously developed land available to meet housing requirements within the urban area. Even the use of garden land here is a minor aspect of urban land recycling at just 3.5% of supply.

4 LIVING WITH HIGHER DENSITY DEVELOPMENT

4.1 The draft National Planning Policy Framework confirms that the use of targets in the existing national policy approach to housing density has been abandoned. It intends instead that local authorities should “set out their own approach to housing density to reflect local circumstances” (paragraph 109). This is set within a section on ‘Significantly increasing the supply of housing’. Local density as an aspect of good design is not being forgotten, however, as paragraph 117 makes clear: “design policies should avoid unnecessary prescription or detail and should concentrate on guiding the overall scale, density, massing, height, landscape, layout and access of new development in relation to neighbouring buildings and the local area more generally”.

4.2 Existing policy in PPS3 *Housing* (June 2011) is more explicitly supportive of achieving higher densities than the market might otherwise offer:

“The density of existing development should not dictate that of new housing by stifling change or requiring replication of existing style or form. If done well, imaginative design and layout of new development can lead to a more efficient use of land without compromising the quality of the local environment” (paragraph 50).

The pre-existing range of criteria is listed against which local authorities should develop their own density policies, as a contribution to the efficient use of land (paragraph 46), and regional plans are still encouraged to include housing density policies (paragraph 45).

4.3 The current policy is less emphatic on density than the one inherited by the Coalition Government. The November 2006 version of PPS3 included a target for housing densities:

“Local Planning Authorities may wish to set out a range of densities across the plan area rather than one broad density range although 30 dwellings per hectare (dph) net should be used as a national indicative minimum to guide policy development and decision-making, until local density policies are in place” (paragraph 47) with justification required for any lower density proposal.

This policy was immediately removed by the Government in a change to PPS3 in June 2010. The overall effect of the change now proposed compared with the policy of the previous Government is to remove minimum density targets (which were hardly adventurous) and play down the benefits of seeking higher housing densities.

4.4 In 2009 the average density of new housing across England as a whole was 47 dwellings per hectare on brownfield sites and 29 dwellings per hectare (dph) on greenfield sites (CLG Live Table P231). Densities were often much higher in cities, with the local authority data on densities averaged over 2007-10 showing 100dph or more in Salford, Sheffield, Southampton and half the London Boroughs (CLG Live Table P232). These city housing developments are likely to have been almost entirely on brownfield sites. With these density differences, the impact on greenfield land requirements of only small changes in the proportions of development taking place on brownfield or greenfield sites is immediately clear.

4.5 In 2009, 80% of all dwellings provided (including conversions) were on previously developed land. Taken together with the density evidence, these figures demonstrate that there is a substantial market for new housing in urban environments at higher densities. None of this is a purely modern experience. Georgian and Victorian squares are as popular now with families as they were when built, typically at densities of about 80dph. Building desirable family accommodation at two to three times the densities typically achieved on modern greenfield sites is clearly straightforward and should be uncontroversial.

4.6 Nonetheless, from time to time there are concerns expressed by politicians, volume house builders and others that higher density housing development is ‘town cramming’, creating unsuitable environments in which to raise children and denying to less well off families the garden space enjoyed by wealthier households. These concerns may lie behind the current

Government’s removal of minimum housing density targets in national planning policy, and the continuing dilution of any commitment to higher densities.

4.7 The terms of this challenge should be appreciated. Housing which is not designed for family life can be built at remarkably high densities and be very attractive in the market. For example, in 2007-10 the average density of dwellings in Tower Hamlets, which includes London’s Docklands, reached 377dph (CLG Live Table P212). This is not the concern. Rather, the emphasis is on the needs of households with modest incomes and households with children, especially both. These households are likely to derive particular benefit from being able to live in central urban areas close to employment opportunities: if suitable accommodation at an acceptable price is not available for them, they will have little choice other than to move to cheaper accommodation at a considerable distance away, perhaps on a greenfield site on the urban edge. That in turn would necessitate lengthy commuting journeys which would be costly and separate parents from children for more hours of the day, as well as raising public interest concerns about congestion, carbon emissions, leaving cities only to the very poor and very wealthy, and countryside loss.

4.8 The ideal arrangement, therefore, may well be to find solutions to the needs of modest income families for housing within urban areas at prices they can afford. This will necessitate higher densities, to spread the high cost of urban land and secure the viability of public transport, and will need to be carried out in such a way that residents do not feel that they are being shoe-horned into unduly modest homes. Critical to achieving this solution are high standards of scheme design, construction and management - an inadequacy of which qualities gave high rise development and high density a bad name in the 1960s and 1970s.

4.9 These issues have been addressed by many interested parties in recent years, including CPRE. In 2008 CPRE issued its study *Family Housing - the power of concentration* specifically to tackle these matters. In reports on a series of developments around England, this showed how family housing could be provided at densities over 50 dwellings per hectare, including direct access to a private garden of at least 48m². At a gross density of 50dph, 3.5% of the gross area can still be kept as open green space. Sir Richard MacCormack of MJP Architects commented in his introduction:

“A theoretical site density of 50dph [net]... allows, for example, a terraced house with a frontage of 6m and a depth of 10m having a 6m-deep garden/parking areas to the front and a 10m rear garden. At two storeys, such a house can comfortably accommodate three bedrooms or, at three storeys, four bedrooms and a second bathroom.”

4.10 All the schemes had a mix of dwelling sizes to meet a variety of community needs, with the key features as set out in Table 8.

Table 8 Higher density family housing case study developments

Case study	Dwellings	Bedrooms	Gross density (dph)
1	59	242	110
2	12	35	77
3	376	996	*40
4	134	283	88
5	14	34	70
6	156	370	47
7	65	127	123

Source: CPRE, 2008, *Family housing - the power of concentration*

* One third of this site is provided as public open space

4.11 These cases show that attractive family housing can be provided which successfully addresses fears that high density new development necessarily involves unduly small dwellings,

loss of privacy, poor sound insulation and a loss of neighbourhood character. A body of evidence is building up to reinforce the points made through the case studies in CPRE's report: see for example:

- *Capital gains: making high density housing work in London*, London Housing Federation, 2002;
- *Better neighbourhoods: making higher density work*, Commission on Architecture and the Built Environment, 2005;
- *Attracting and retaining families in inner urban mixed income communities*, Joseph Rowntree Foundation, 2006.

5 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

5.1 The proportion of all dwellings provided on previously developed land (PDL) rose from 56% in 1997 to a peak of 81% in 2008 in England. At the same time, the density of housing development achieved also increased, rising on greenfield sites from 22 dwellings per hectare (dph) in 1997 to 32dph at its peak in 2007, and more dramatically on brownfield sites from 28dph in 1997 to 49dph at its peak in 2008. National planning policy promoting the use of previously developed land combined with the encouragement of higher housing densities was highly effective after 1997. These helped to secure urban regeneration and to reduce substantially the loss of countryside to built development.

5.2 The draft National Planning Policy Framework proposes to abandon the target supply of housing on previously developed land, cease giving priority nationally to development on these 'brownfield' sites, and drop the minimum housing density which has until recently been recommended. The policy change covers not only housing development but also in effect office and industrial development (which will no longer be targeted specifically on town centres so far as practicable). The benefits to sustainable development from efficient land use by using brownfield sites are now played down.

5.3 Reasons for the proposed change in approach to the brownfield target and more critically on the 'brownfield first' policy are provided in the accompanying *Impact Assessment* issued by CLG. Section 2 of this report shows that the reasons advanced there do not stand up to scrutiny. There has been a fundamental failure to understand that previously developed land is not a largely fixed pot of sites which can be identified now, but is a dynamically changing source of land for new uses as old ones are no longer needed. The evidence shows that on average across England the number of hectares of PDL replenishing the supply between 2001 and 2009 exceeded the rate at which it was built on. With higher densities now being achieved on brownfield sites, the number of dwellings which that land can support has grown considerably. The assertion in the *Impact Assessment* that "under plausible assumptions, the brownfield land target would cease to be sustainable in the (high demand) southern regions by 2015-16" is scaremongering: the southern regions have demonstrated particularly resilient supplies of PDL, and neither these nor any other region are in danger of 'running out'.

5.4 This report has demonstrated that the *Impact Assessment* variously:

- misrepresents the 'brownfield first' policy (housing supply need not decline even if the supply of brownfield stops);
- uses the wrong information from the National Land Use Database to support its claim that the supply of PDL is dwindling (when NLUD's data shows that PDL available and suitable for housing has been rising);
- overstates the impact of remediation costs on the redevelopment of brownfield sites (not least by quoting information for contaminated land remediation rather than for uncontaminated land);
- selectively argues that the extra choice of sites that would be freed-up for development will promote competition on greenfield sites (while neglecting the loss of interest in some brownfield sites and the consequences for urban life);
- claims that prioritising brownfield constrains cities from growing to be more efficient (whereas the brownfield first policy was introduced partly for that reason, to assist urban renewal); and
- suggests that building on greenfield sites produces more valuable homes as residents value green spaces adjacent (or put another way, building on the greenspace enjoyed by existing residents will not only deprive them of amenity but also reduce the value of their houses).

5.5 The weaknesses of the arguments set out in the *Impact Assessment* are compounded by arithmetically incorrect efforts to illustrate the effects of various policy scenarios on greenfield land requirements. Table B3.2 in the *Impact Assessment* attempts to illustrate the combined effect of greater use of greenfield sites, lower housing densities upon them, and overall increases in housing output of up to 5%. Under none of these scenarios does CLG calculate that

more than 100 extra hectares of greenfield land would be used annually, though our calculations suggest that, for instance, a 5% increase in output with 27% of development on greenfield land would require an extra 720 hectares annually rather than CLG's extra 81 hectares, on the same base assumptions. The *Impact Assessment* seriously understates the adverse effects of the draft NPPF on the requirements for greenfield land.

5.6 Overall, the claims for economic benefits in encouraging more house building on greenfield sites do not stand up to scrutiny, other than its point that house builders can find this more profitable in some cases. The deeply unconvincing case offered is wholly insufficient to justify the major policy change of abandoning the 'brownfield first' policy.

5.7 Section 3 assembles evidence primarily on the rate at which PDL is replenished alongside its rate of use for housing. The national and regional findings are reflected locally, inevitably with more fluctuation in the figures for geographically smaller areas, but confirming in more detail the broad picture established in Section 2. The evidence shows that there is no case for giving up the 'brownfield first' policy on the basis that the supply is running out, even on the basis of examining areas where the supply of suitable sites could be expected to be most problematic, such as:

- an authority with considerable pressure of demand, which wishes to continue operating a 'brownfield first' policy, which has greenfield sites available if necessary but where those greenfields are heavily constrained (Stockport MBC); and
- authorities with virtually no greenfield sites available but planning policies which assume an ongoing supply of housing (Inner London Boroughs).

There is clear evidence from these cases that brownfield land continues to come forward in substantial quantities even in these potentially most awkward circumstances, often on 'windfall' sites which cannot readily be predicted individually.

5.8 Concern has been expressed in Parliament and elsewhere about the risk to the character of existing residential areas from the development of new housing on gardens ('garden-grabbing'). This was mentioned in the Coalition Agreement and has led to the Government redesignating residential gardens as 'greenfield' rather than 'brownfield'. Data are being collected for the first time on the extent of this experience (not yet published), though a preliminary CLG survey suggests that the problem is confined largely to the South East. Certainly it was a minor issue in our Stockport case study area, where it accounted for just 3.5% of supply even though this is an area with development pressure. At present, residential gardens do not appear to be a significant issue in the consideration of policy on brownfield land recycling.

5.9 Promoting the use of brownfield sites, which tend to have significantly higher residential densities than greenfield sites, does not condemn households to living in small dwellings in disharmony with their neighbours as is sometimes alleged. The challenge to family life can readily be avoided through high standards of scheme design, construction and management. Private gardens can still be provided in higher density schemes (generally over 50 dwellings per hectare, and sometimes much higher). This is confirmed by previous research, including examples of completed schemes provided in an earlier CPRE publication. Fears of 'town-cramming' are largely unjustified, and quite insufficient as a basis for changing national planning policy on brownfield land recycling.

Recommendations

5.10 Recommendations arising from this study are:

(a) The policy of encouraging development on previously developed land before considering developing greenfield sites ('brownfield first') should be retained in the final National Planning Policy Framework (NPPF), for all types of development.

(b) The NPPF should reiterate the fundamental benefits for sustainability (in particular carbon reductions), urban renewal, countryside protection and social welfare arising from prioritising development on brownfield sites, and promote policies to achieve them.

- (c) The Government should revise policy to allow for the reasonable expectations of 'windfall' sites coming forward in a local authority's five year supply of developable land for new housing, rather than these being omitted from consideration for ten years ahead in development plans. This would respond to the dynamic nature of the urban land market by recognising the contribution of 'windfall sites' to ongoing supplies of land for housing and other purposes, even if individual sites cannot readily be predicted in advance.
- (d) The National Planning Policy Framework should include policies which specifically encourage well-designed housing development at medium densities (at least 30 dwellings per hectare) or high densities consistent with other planning objectives, including the provision of family accommodation within urban areas at densities above 50dph.
- (e) The NPPF should encourage local planning authorities to set targets for the re-use of previously developed land, based on local circumstances.
- (f) Government policy on sustainable development, produced by Defra, should continue to emphasise the brownfield first approach. Land recycling and housing density should remain indicators of sustainable development.
- (g) In order to assess progress against the other recommendations mentioned above, local planning authorities should continue to monitor the overall density of new housing and the numbers and proportions of new housing being built on brownfield land, and provide returns to CLG and the HCA on, respectively, Land Use Change Statistics and the National Land Use Database on an annual basis.

Appendix 1 The impact of remediation costs on redeveloping brownfield sites

A1.1 On brownfield sites there are likely to be additional costs of remediation (compared with greenfield sites). These will depend on the scale and nature of previous development that must be removed first and whether the land has been contaminated. The prospective builder must take these into account when calculating the amount to bid for the land. This will reflect both known costs and an assessment of the risk of additional costs that might be encountered when a builder gets onto the site. Fortunately, higher value land uses, such as housing and retailing, are relatively well-placed to fund remediation costs. There may well also be some benefits to set against these costs when compared with greenfield sites, such as services already being present on the site. If remedial costs are very high, even to the point where the land value is negative, then development will only be practicable if there is a subsidy of some kind. This might come from a profitable development elsewhere or from public funds for urban regeneration.

A1.2 The *Impact Assessment* accompanying the draft NPPF has misrepresented some of these issues. First, it overstates the cost of remediation. “The average remediation cost of brownfield land is estimated to be around £250,000 per hectare, reducing the average potential value of brownfield land for housing” (page 50). This assertion relies on two documentary sources both of which specifically refer to costs on contaminated land, not on ‘ordinary’ brownfield sites. The *Impact Assessment* in November 2010 of a proposed *Simplification of contaminated land statutory guidance* states in a footnote that

“Defra and WAG have chosen the £250,000 per hectare estimate... on the basis of experience in operating local authority grant schemes, and on the basis of figures quoted in English Partnerships’ “Best Practice Note 27 (revised February 2008) *Contamination and Dereliction Remediation Costs*”. The £250,000 figure is likely to be conservative (for example Best Practice Note 27 gives cost estimates from £50,000 per hectare to £1.375m per hectare depending on site circumstances).”

In that source, the cheapest sites for remediation refer to “industrial sites, mine/colliery spoil heaps, factories and ‘works’”, rather than to simple brownfield sites.

A1.3 Second, Kate Barker’s *Review of Land Use Planning* did not say what is claimed to be quoted from it - that the greater risk on brownfield sites can reduce the number of sites which builders have the capacity to take through the planning system at any one time (page 51). Kate Barker took a very different view about brownfield land, postulating the possibility in her interim report that “the lack of fiscal pressure on empty properties and vacant brownfield land is hindering the speed at which they come forward for development”, and in her final report recommending that “The Government... should reform business rate relief for empty property and consider introducing a charge on vacant and derelict brownfield land.”

A1.4 Kate Barker’s view on this matter is also the opposite of the argument made in the *Impact Assessment* supporting the draft NPPF, that “A rigid focus on brownfield development over other sites has contributed to a rise in land prices by focussing development on previously developed sites...” (page 49).

A1.5 Third, the assertion is made that “The national [brownfield] target is likely to continue to stifle housing growth even in areas where there is a substantial amount of undeveloped land if remedial costs are high” under a ‘do nothing’ policy option (page 50). (The key point of this claim is addressed in paragraph 2.18 above.) Very high remediation costs can indeed be a constraint, but these are not the norm. In any event the distinguishing by the National Land Use Database of previously developed land ‘suitable for housing’ from the total available eliminates sites where housing would be impractical. With 31,160 hectares available and suitable for housing in 2009, there is not much indication of housing growth being stifled for want of developable land.

Appendix 2 **Area-based and dwelling-based assessments for housing supply on PDL by region****Table A2.1** **North East**

Year	NLUD PDL suitable for housing ¹	LUCS land changing to residential ²	LUCS % residential from PDL ³	LUCS PDL used for housing (ha) ⁴	NLUD PDL dwellings estimate ¹	NLUD density (dph) assumption ¹	Dwelling completions ⁵	LUCS % dwellings on PDL ⁶	LUCS PDL dwellings built ⁴	LUCS actual PDL density ⁷
2001	1,740	240	41	98	48,800	28	6,540	45	2,943	28
2002	1,910	230	52	120	51,800	27	5,720	57	3,260	28
2003	1,760	230	48	110	45,300	26	5,940	52	3,089	31
2004	1,770	160	44	70	49,600	28	6,710	61	4,093	43
2005	1,660	170	57	97	48,800	29	7,660	67	5,132	45
2006	1,340	270	60	162	42,600	32	7,620	69	5,258	46
2007	1,420	230	59	136	45,880	32	8,860	66	5,848	47
2008	2,020	120	65	78	63,910	32	4,980	72	3,586	45
2009	2,030	80	60	48	66,090	33	4,410	66	2,911	43

Table A2.2 **North West**

Year	NLUD PDL suitable for housing ¹	LUCS land changing to residential ²	LUCS % residential from PDL ³	LUCS PDL used for housing (ha) ⁴	NLUD PDL dwellings estimate ¹	NLUD density (dph) assumption ¹	Dwelling completions ⁵	LUCS % dwellings on PDL ⁶	LUCS PDL dwellings built ⁴	LUCS actual PDL density ⁷
2001	3,950	650	63	409	138,400	35	15,560	70	10,892	30
2002	3,960	640	64	410	136,100	34	17,830	73	13,016	30
2003	3,910	730	62	453	144,400	37	18,290	72	13,169	40
2004	3,820	460	65	299	152,100	40	18,190	79	14,370	50
2005	3,810	510	69	352	161,600	42	19,090	81	15,463	51
2006	3,560	480	73	350	154,800	43	18,530	80	14,824	55
2007	3,640	500	75	375	164,330	45	19,570	83	16,243	56
2008	3,790	260	72	187	188,310	50	15,860	81	12,847	55
2009	5,110	170	73	124	265,230	52	9,940	83	8,250	47

Table A2.3 Yorkshire and the Humber

Year	NLUD PDL suitable for housing ¹	LUCS land changing to residential ²	LUCS % residential from PDL ³	LUCS PDL used for housing (ha) ⁴	NLUD PDL dwellings estimate ¹	NLUD density (dph) assumption ¹	Dwelling completions ⁵	LUCS % dwellings on PDL ⁶	LUCS PDL dwellings built ⁴	LUCS actual PDL density ⁷
2001	2,510	680	52	354	95,300	38	13,260	55	7,293	23
2002	2,320	560	58	325	87,500	38	13,450	63	8,473	26
2003	2,520	510	54	275	101,200	40	13,710	65	8,911	40
2004	2,670	430	62	267	108,700	41	14,260	69	9,839	36
2005	2,560	400	63	252	109,400	43	15,010	74	11,107	45
2006	2,610	400	58	232	111,600	43	15,430	68	10,492	50
2007	3,030	490	69	338	130,820	43	17,100	76	12,996	55
2008	2,730	350	72	252	125,830	46	12,320	79	9,733	51
2009	2,420	200	69	138	113,380	47	9,040	79	7,142	40

Table A2.4 East Midlands

Year	NLUD PDL suitable for housing ¹	LUCS land changing to residential ²	LUCS % residential from PDL ³	LUCS PDL used for housing (ha) ⁴	NLUD PDL dwellings estimate ¹	NLUD density (dph) assumption ¹	Dwelling completions ⁵	LUCS % dwellings on PDL ⁶	LUCS PDL dwellings built ⁴	LUCS actual PDL density ⁷
2001	2,910	720	42	302	79,600	27	13,400	48	6,432	25
2002	2,970	670	44	295	82,000	28	14,860	54	8,024	29
2003	2,180	710	47	334	67,000	31	14,440	54	7,798	30
2004	2,240	450	48	216	70,000	31	15,180	55	8,349	40
2005	2,170	480	46	221	72,300	33	17,120	54	9,245	40
2006	2,510	620	54	335	90,300	36	16,800	65	10,920	41
2007	2,460	560	55	308	96,420	39	18,620	61	11,358	41
2008	2,340	310	60	186	96,420	41	12,640	68	8,595	41
2009	2,770	200	57	114	98,370	36	10,810	60	6,486	34

Table A2.5 West Midlands

Year	NLUD PDL suitable for housing ¹	LUCS land changing to residential ²	LUCS % residential from PDL ³	LUCS PDL used for housing (ha) ⁴	NLUD PDL dwellings estimate ¹	NLUD density (dph) assumption ¹	Dwelling completions ⁵	LUCS % dwellings on PDL ⁶	LUCS PDL dwellings built ⁴	LUCS actual PDL density ⁷
2001	2,610	530	53	281	71,300	27	13,130	60	7,878	31
2002	2,700	480	62	298	71,700	27	14,170	67	9,494	32
2003	2,970	460	61	281	79,400	27	13,980	70	9,786	37
2004	2,770	370	65	240	77,100	28	13,760	73	10,045	40
2005	2,930	450	65	292	85,500	29	16,170	77	12,451	47
2006	2,430	370	70	259	76,800	32	14,880	81	12,053	50
2007	2,480	440	73	321	84,340	34	14,290	79	11,289	48
2008	2,490	240	73	175	88,000	35	11,450	85	9,732	44
2009	2,120	180	70	126	84,350	40	9,540	78	7,441	43

Table A2.6 East of England

Year	NLUD PDL suitable for housing ¹	LUCS land changing to residential ²	LUCS % residential from PDL ³	LUCS PDL used for housing (ha) ⁴	NLUD PDL dwellings estimate ¹	NLUD density (dph) assumption ¹	Dwelling completions ⁵	LUCS % dwellings on PDL ⁶	LUCS PDL dwellings built ⁴	LUCS actual PDL density ⁷
2001	4,480	850	58	493	109,800	25	16,060	59	9,475	22
2002	3,980	790	55	434	101,200	25	17,130	58	9,935	25
2003	5,120	760	59	448	111,100	22	18,720	60	11,232	29
2004	4,880	510	59	301	117,400	24	19,370	63	12,203	37
2005	4,430	670	60	402	117,800	27	20,110	69	13,876	38
2006	4,400	560	60	336	117,400	27	21,600	65	14,040	36
2007	4,180	700	62	434	117,720	28	22,980	68	15,626	37
2008	4,440	400	61	244	131,170	30	18,980	65	12,337	36
2009	4,290	400	66	264	125,780	29	15,500	68	10,540	32

Table A2.7 London

Year	NLUD PDL suitable for housing ¹	LUCS land changing to residential ²	LUCS % residential from PDL ³	LUCS PDL used for housing (ha) ⁴	NLUD PDL dwellings estimate ¹	NLUD density (dph) assumption ¹	Dwelling completions ⁵	LUCS % dwellings on PDL ⁶	LUCS PDL dwellings built ⁴	LUCS actual PDL density ⁷
2001	2,470	240	89	214	149,200	60	14,730	90	13,257	49
2002	2,120	230	85	195	117,600	55	15,650	90	14,085	62
2003	1,890	230	94	216	114,500	61	18,360	95	17,442	86
2004	1,950	220	95	209	132,100	68	24,190	96	23,222	99
2005	1,850	190	96	182	125,300	68	18,250	97	17,702	106
2006	1,910	170	92	156	130,000	68	21,070	93	19,595	96
2007	2,130	330	97	320	170,120	80	23,160	95	22,002	76
2008	2,530	160	95	152	236,780	94	20,510	94	19,279	118
2009	3,580	170	97	165	452,110	126	20,200	97	19,594	117

Table A2.8 South East

Year	NLUD PDL suitable for housing ¹	LUCS land changing to residential ²	LUCS % residential from PDL ³	LUCS PDL used for housing (ha) ⁴	NLUD PDL dwellings estimate ¹	NLUD density (dph) assumption ¹	Dwelling completions ⁵	LUCS % dwellings on PDL ⁶	LUCS PDL dwellings built ⁴	LUCS actual PDL density ⁷
2001	4,750	900	63	567	119,300	25	21,350	66	14,091	25
2002	5,700	880	65	572	137,500	24	22,680	66	14,969	26
2003	5,410	930	62	577	151,400	28	24,150	66	15,939	35
2004	5,390	700	70	490	160,200	30	25,300	74	18,722	39
2005	5,280	830	72	598	160,700	30	27,910	75	20,932	36
2006	5,220	900	72	648	160,500	31	26,760	76	20,338	39
2007	4,580	890	75	667	151,390	33	30,570	75	22,927	41
2008	5,420	480	76	365	173,870	32	28,130	78	21,941	37
2009	5,410	400	75	300	179,780	33	25,000	77	19,250	37

Table A2.9 South West

Year	NLUD PDL suitable for housing ¹	LUCS land changing to residential ²	LUCS % residential from PDL ³	LUCS PDL used for housing (ha) ⁴	NLUD PDL dwellings estimate ¹	NLUD density (dph) assumption ¹	Dwelling completions ⁵	LUCS % dwellings on PDL ⁶	LUCS PDL dwellings built ⁴	LUCS actual PDL density ⁷
2001	2,640	660	42	277	107,400	41	15,500	49	7,595	30
2002	2,860	580	41	238	98,900	35	15,330	49	7,512	34
2003	3,720	680	50	340	135,600	36	16,450	58	9,541	40
2004	3,160	480	50	240	118,700	38	17,150	58	9,947	39
2005	2,950	560	52	291	99,200	34	18,160	62	11,259	42
2006	2,760	450	53	238	90,100	33	18,170	58	10,539	43
2007	2,600	650	58	377	90,000	35	20,410	64	13,062	46
2008	3,040	450	64	288	105,340	35	17,820	72	12,830	41
2009	3,430	350	58	203	109,030	32	14,670	65	9,535	40

Table A2.10 England

Year	NLUD PDL suitable for housing ¹	LUCS land changing to residential ²	LUCS % residential from PDL ³	LUCS PDL used for housing (ha) ⁴	NLUD PDL dwellings estimate ¹	NLUD density (dph) assumption ¹	Dwelling completions ⁵	LUCS % dwellings on PDL ⁶	LUCS PDL dwellings built ⁴	LUCS actual PDL density ⁷
2001	28,060	5,460	55	3,003	919,100	33	129,530	61	79,010	28
2002	28,520	5,050	57	2,878	884,200	31	136,820	64	87,560	31
2003	29,480	5,250	58	3,045	949,800	32	144,040	67	96,510	39
2004	28,650	3,790	62	2,350	986,000	34	154,110	72	110,960	46
2005	27,640	4,280	63	2,696	980,700	35	159,480	74	118,020	46
2006	26,750	4,200	65	2,730	974,000	36	160,860	73	117,430	47
2007	26,510	4,780	68	3,250	1,051,030	40	175,560	74	129,910	48
2008	28,810	2,770	70	1,939	1,209,630	42	142,690	78	111,300	49
2009	31,160	2,140	69	1,477	1,494,070	48	119,110	77	91,710	47

Sources

- 1 NLUD data from annual reports (Table numbers vary)
- 2 CLG Live Table P222
- 3 CLG Live Table P224
- 4 Product of previous two columns, (marginally different from England hectares figures in Live Table P226)
- 5 CLG Live Table 217
- 6 CLG Live Table P212
- 7 CLG Live Table P231

Appendix 3 **National Land Use Database: a note on statistical reliability**

A3.1 NLUD data are presented at the site, local planning authority, regional and national scales. NLUD provides data on previously developed land (PDL) by area, split into five types of source, and includes an assessment of land suitable for housing (estimated by local planning authorities). Land suitable for housing is also converted to potential dwelling numbers via an assumed regional density (also estimated by local planning authorities). NLUD national data are available for 1998 and for each year from 2001, with 2009 the most recently published. No survey was carried out in 1999 or 2000.

A3.2 The 1998 data have deficiencies not only in the context of the absence of the following two years' data but because:

- (i) the response rate was not particularly good (293 of 362 authorities [81%] containing 74% of the information), and may not be very reliable for analysing trends; and in particular
- (ii) some definitions were changed between the 1998 and 2001 surveys, resulting in the numbers of sites required to be counted increasing discernibly, which would affect the analysis of trends.

A3.3 Responses to the 2001 survey were especially poor: 130 authorities did not respond at all. The raw data accounted for only two thirds of the grossed-up estimates (25% from missing authorities and 8% from incomplete submitted returns). Many authorities who failed to respond to the 2001 survey did respond to later surveys. Missing years' data can clearly be inappropriate starting points for trend analyses.

A3.4 The published results from the 2009 data are much reduced in scope compared with earlier surveys, and omit all data at the local planning authority level. This has prevented trend analysis at the local planning authority level beyond 2008. There are various limitations with the NLUD data which affected all years' data.

- (i) *Non-responses*

A3.5 A small number of authorities have rarely supplied NLUD returns and others have respond only intermittently. Infrequent returns from major authorities such as Leeds and Gateshead make time-series analysis impractical in these areas. The considerable undercounting in the raw data necessitates 'grossing-up' the data supplied, which can be important in regions where there are significant urban omissions.

- (ii) *Incomplete responses*

A3.6 This is by far the most serious problem, even in 2007 accounting for raw data being 16% short of the grossed-up total for England as a whole (including 30% in Yorkshire & Humber). The region with persistently the least problem of this type is the North East (always under 10%) followed by the South East (usually 12-13%). Where whole categories of data were missing in local authority returns, these had to be imputed. It is instructive that the grossing-up is "based on the assumption that the amount of previously-developed land within an authority is related to the amount of urban land. This assumption was supported by an analysis of existing information on brownfield sites, such as Land Use Change Statistics and the Derelict Land Survey" (2007 report page 67). However, this is the opposite of the assumption made in CLG's *Impact Assessment* that for policy purposes PDL is running out, even in urban areas.

A3.7 There is a particular problem with incomplete responses in the category of 'known redevelopment potential but no planning allocation or permission', which has been persistently around one quarter short of the grossed-up total for the country. This is an important category but is a matter of judgement by local planning authorities completing the survey returns. Conversely, just 18 authorities made complete returns in all categories in 2008 (helpfully identified by the Homes and Communities Agency). Knowledge of which authorities provided complete returns to earlier surveys was lost when responsibility for NLUD passed from CLG to the HCA.

(iii) *Local government reorganisation*

A3.8 Where local authorities have been amalgamated since 2002, discrepancies can arise with trend series data. These will be more evident after 2007. They also impose limitations in comparisons with recent data from the Land Use Change Statistics (LUCS), which have been revised to current authority boundaries. This means, for example, that NLUD data are no longer comparable with LUCS data in Cornwall, Wiltshire, Northumberland and Durham.

A3.9 The response of the present study to these issues has been to:

- omit data from the 1998 survey from analysis;
- omit the 2001 NLUD data from local level analysis, due partly to the poor response rate and partly because related local authority data on dwelling completions (excluding conversions) is not available from 2001-02 or earlier in the CLG Live Table 253 series¹¹;
- avoid using for illustrative purposes those areas in which local government reorganisation has taken place since 2002, where time-series data are either impractical or not comparable with LUCS;
- focus for illustrative purposes on areas with the better response rates, i.e. the North East region (though affected by local government reorganisation) and South East region.

A3.10 One of the five NLUD data categories is 'allocated in a local plan or with planning permission'. Caution needs to be exercised in using NLUD data which includes this category, in order to avoid double-counting this information on land available for housing (which is supplied by local planning authorities on a regular basis).

A3.11 There is considerable overlap in the scope of the Land Use Change Statistics and NLUD. LUCS national data extend back to 1985 and local planning authority level data back to 1993, though the latter are always averaged over a period of years. Both provide data primarily on areas of land in hectares, though the strong emphasis on land for residential use in LUCS has resulted in various tables being expressed in terms of dwellings and dwelling densities. All LUCS data on county and local planning authority level use of PDL is in percentage terms, with no ability to aggregate to higher tiers of administrative area (for lack of the original dwelling numbers). Using density information as an intermediary, both NLUD and LUCS should be capable of analysis in terms of either hectares or dwellings. LUCS is superior on dwelling data as it uses actual densities rather than assumed densities. However, there are risks in treating the data from the two sources as interchangeable, as the two surveys can generate different results for datasets which ought to be very similar.

¹¹ Green Balance is grateful to DCLG for making available provisional data for the years 2002-03 and 2003-04 in that series.

Appendix 4 Use and replenishment of PDL in South East local authorities

1	2	3	4	5	6	7
Authority	Analysis period	Dwellings built on PDL	PDL used for housing (ha)	Replenishment of PDL (ASFH) (ha)	PDL (ASFH) in 2008 (ha)	Replenishment of PDL (ASFH exc. P&A) (ha)
Arun	2002-08	706	12	13	28	10
Adur	2002-08	1,894	54	93	53	87
Ashford	2002-08	1,469	49	53	25	46
Aylesbury Vale	2003-08	2,123	76	13	63	17
Basingstoke & Deane	2002-08	2,617	68	79	32	69
Bracknell Forest	2003-08	1,104	29	31	43	50
Brighton & Hove	2003-08	2,049	25	33	67	29
Canterbury	2002-08	2,499	66	106	80	71
Cherwell	2002-08	1,297	45	751	734	48
Chichester	2002-08	2,000	91	123	59	98
Chiltern	2002-08	1,138	61	86	42	69
Crawley	2002-08	1,276	20	-37	31	-45
Dartford	2002-08	2,950	63	996	946	998
Dover	2002-08	922	27	92	76	52
Eastbourne	2002-08	1,548	21	-29	7	14
Eastleigh	2002-08	2,782	65	57	29	49
East Hampshire	2002-08	1,932	100	114	23	120
Elmbridge*	2002-08	>2,727	>168	>164	168	>163
Epsom & Ewell	2002-08	1,549	45	42	34	36
Fareham	2003-08	1,689	51	73	50	57
Gosport**	2002-08	>1,277	>29	>42	27	>24
Gravesham	2002-08	1,916	46	136	119	29
Guildford	2002-08	2,420	104	156	54	104
Hart	2003-08	906	30	30	35	24
Hastings	2003-08	475	11	2	25	1
Havant	2003-08	1,005	22	60	56	45
Horsham	2002-08	2,035	72	91	31	79
Isle of Wight	2002-08	3,174	84	94	47	82
Lewes	2002-08	935	27	84	69	43
Maidstone	2002-08	3,742	98	55	37	59
Medway*	2004-08	>1,910	>42	>-231	83	>-162
Mid-Sussex	2003-08	1,749	44	130	113	110
Milton Keynes*	2002-08	>1,949	>46	>132	149	>136
Mole Valley	2002-08	1,527	68	67	1	69
New Forest*	2002-08	>1,783	>71	>59	23	>73
Oxford	2003-07	2,409	41	42	51	28
Portsmouth	2002-08	3,852	41	108	105	74
Reading*	2003-08	>2,542	>32	>98	100	>26
Reigate & Banstead	2002-08	3,380	113	183	115	178
Rother	2002-08	1,064	49	49	9	50
Runnymede	2002-08	1,408	47	78	35	46
Rushmoor	2003-07	1,927	33	16	35	31
Sevenoaks	2002-08	1,031	52	54	28	44
Shepway	2002-08	1,043	35	40	49	27
Slough	2002-08	2,617	39	116	96	86
Southampton						
South Bucks*	2002-08	>922	>53	>46	29	>46
South Oxfordshire	2004-08	873	38	-58	27	-59
Spelthorne	2004-08	1,142	21	47	37	34
Surrey Heath	2003-08	1,617	52	62	15	55

1	2	3	4	5	6	7
Authority (continued)	Analysis period	Dwellings built on PDL	PDL used for housing (ha)	Replenishment of PDL (ASFH) (ha)	***PDL (ASFH) in 2008 (ha)	Replenishment of PDL (ASFH exc. P&A) (ha)
Swale*	2002-08	>1,257	>39	>56	58	>42
Tandridge	2002-08	1,971	80	71	5	78
Test Valley	2002-08	1,453	80	76	2	76
Thanet						
Tonbridge & Malling						
Tunbridge Wells	2002-08	1,770	57	63	48	58
Vale of White Horse	2002-08	2,119	76	89	44	85
Waverley	2002-08	1,240	61	64	29	62
Wealden	2002-08	1,156	56	103	56	87
West Berkshire	2002-08	2,546	88	236	240	189
West Oxfordshire	2003-08	1,442	44	43	1	45
Winchester**	2002-08	>2,765	>97	>97	11	>95
Windsor&Maidenhead	2002-07	1,847	79	85	42	89
Woking	2002-08	3,039	66	77	18	72
Wokingham	2002-08	2,945	113	102	47	91
Worthing	2002-08	1,027	20	47	37	24
Wycombe	2002-08	2,438	69	116	82	121

Notes

Source: Derived from local authority tables generated from NLUD and LUCS (see Table 8 and footnotes)

* Dwelling supply figures missing for one year in analysis period.

** Dwelling supply figures missing for two years in analysis period.

*** PDL(ASFH) available at the end of the analysis period: usually 2008, but 2007 in three authorities.

Blank entries: insufficient dwelling supply data.

Figures for dwellings built on PDL and areas they use (cols. 3 and 4) are derived partly from rounded numbers and from data sets that are not necessarily wholly compatible: they should therefore not be relied upon at the level of accuracy implied in the table. The replenishment figures therefore also have a margin of error.

Negative figures for replenishment can only arise if sites thought to have been suitable for housing at the start of the analysis period were subsequently found not to be suitable; conversely, some replenishment figures may have been inflated if earlier sites not included were later found suitable for housing (though dramatic increases in the amount of PDL suitable for housing, such as in Cherwell, Dartford, Elmbridge and West Berkshire, are more likely to be explained by suitable land becoming newly available).

Comparison of columns 4 and 5 shows the amount of previously developed land used for housing and the replenishment of it over the analysis period, in hectares. The most recent data on amounts of available PDL (all suitable for housing) indicated in column 6 can be compared with the rate of use of PDL. Figures on usage in column 4 are for the whole of the analysis period in each authority, so an average annual rate must be calculated for direct comparison with column 6.