



ENGLISH HERITAGE

Sustainable Heritage: Retrofitting Traditional Buildings for Improved Energy Performance



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No exemption for the Historic Environment!



© London Evening Standard

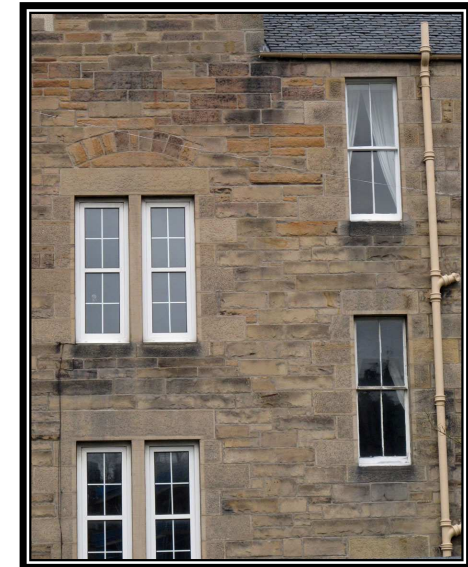
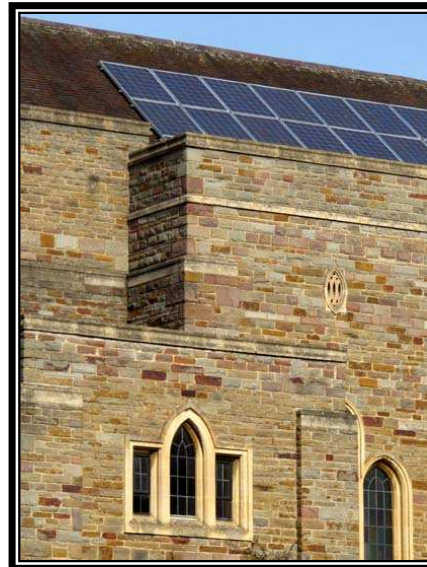
- Cassar Report 2005 –
UCL Centre for Sustainable Heritage





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Adaptation Issues for the Historic Environment





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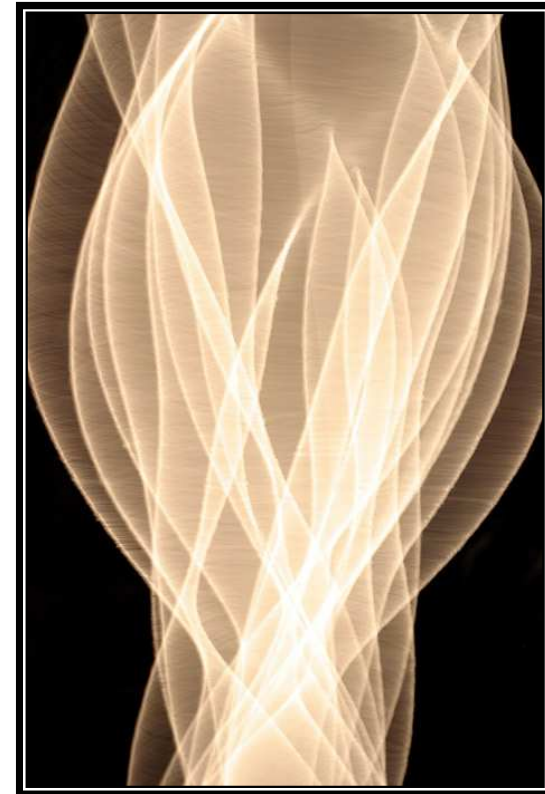
© Rena Sharwood

An unseemly tangle OR
measured, seamless integration

Historic Environment part
of Sustainability!



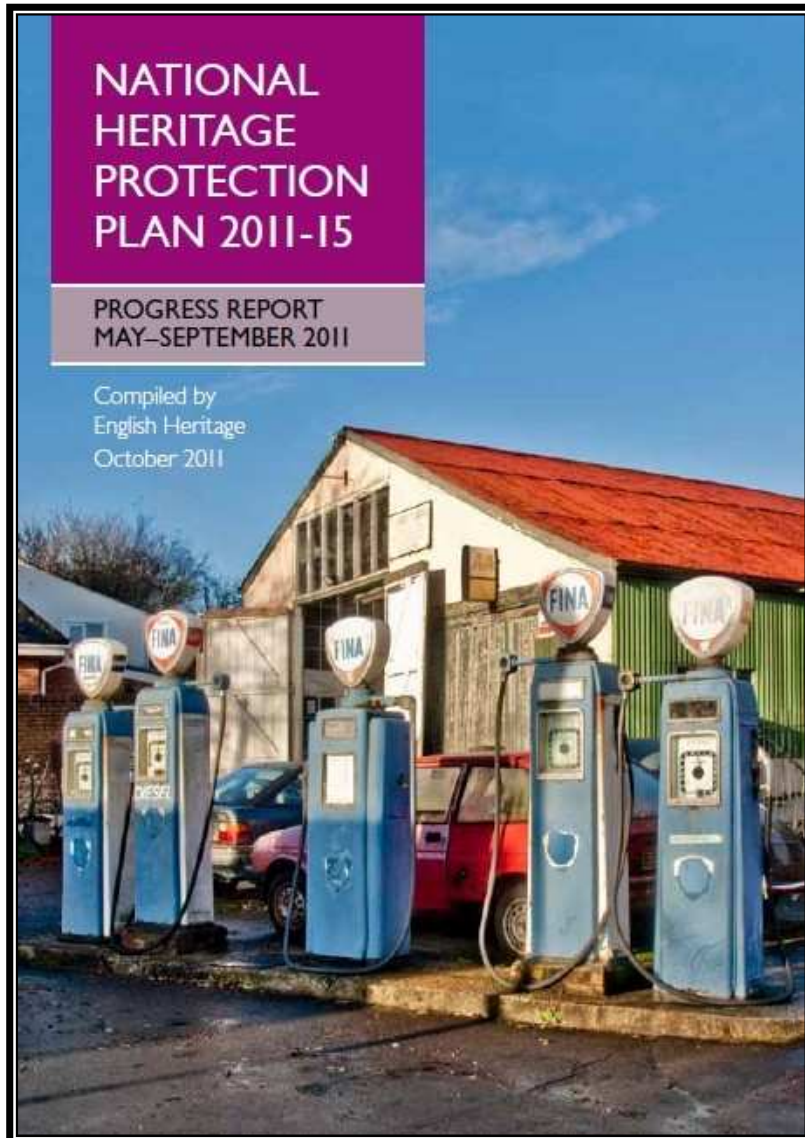
Historic Environment vs.
Sustainability? 



© National Geographic

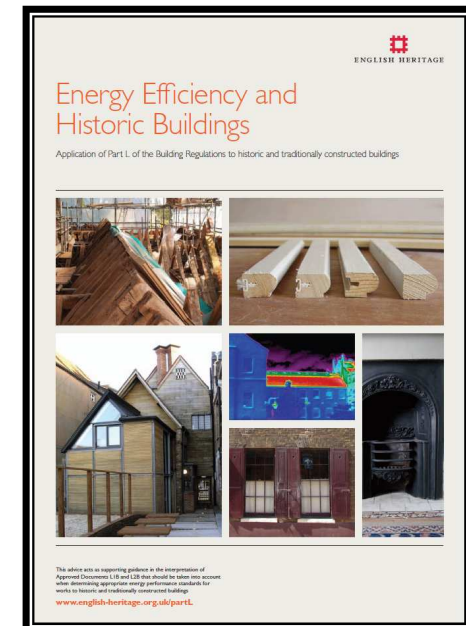
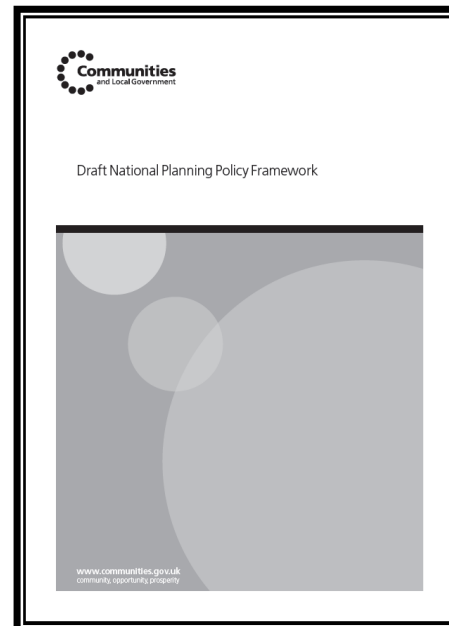


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Policy Considerations

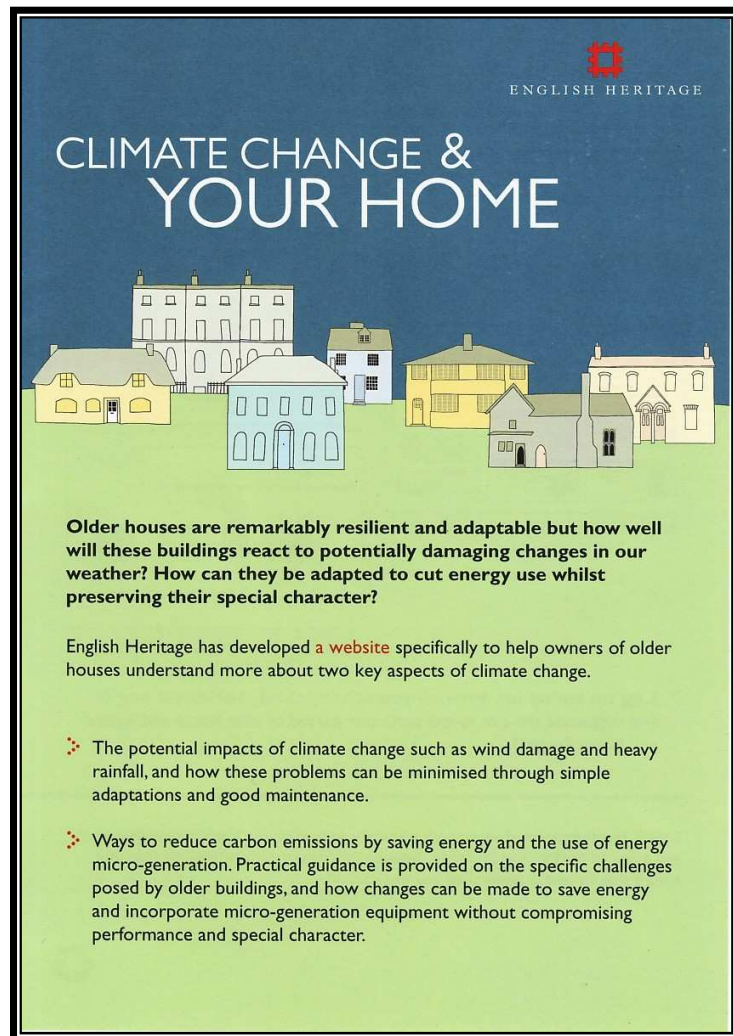
- National Planning Policy Framework
- National Heritage Protection Plan
- Updated Part L Guidance
- The Green Deal





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Climate Change and Your Home



Our dedicated website covering:

- Climate Change in Context;
- Climate Impacts;
- Saving Energy; and
- Further Information.

It can be customised and includes our latest research findings

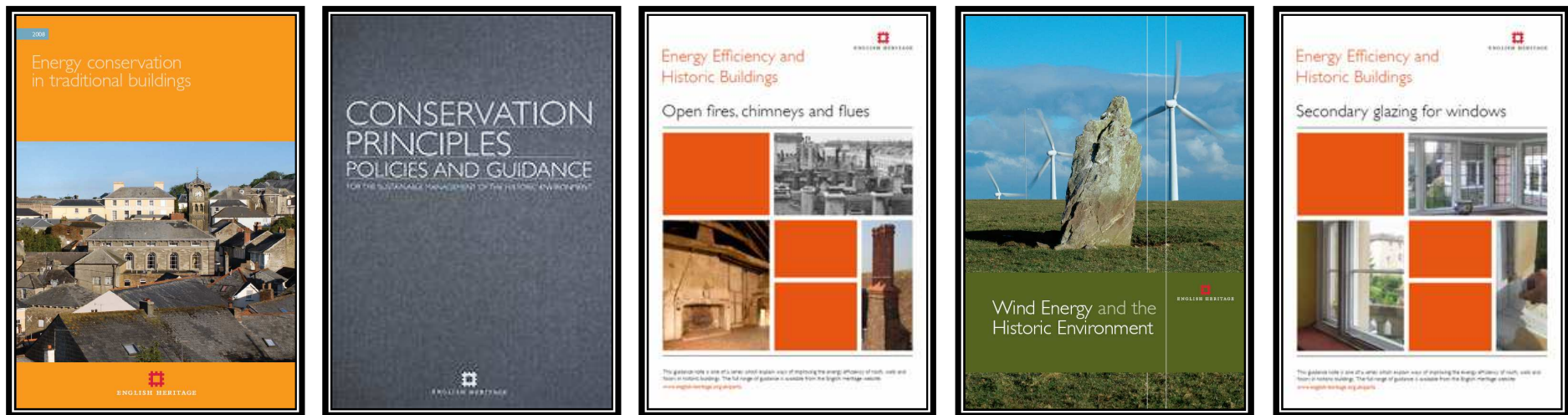
www.climatechangeandyourhome.org.uk



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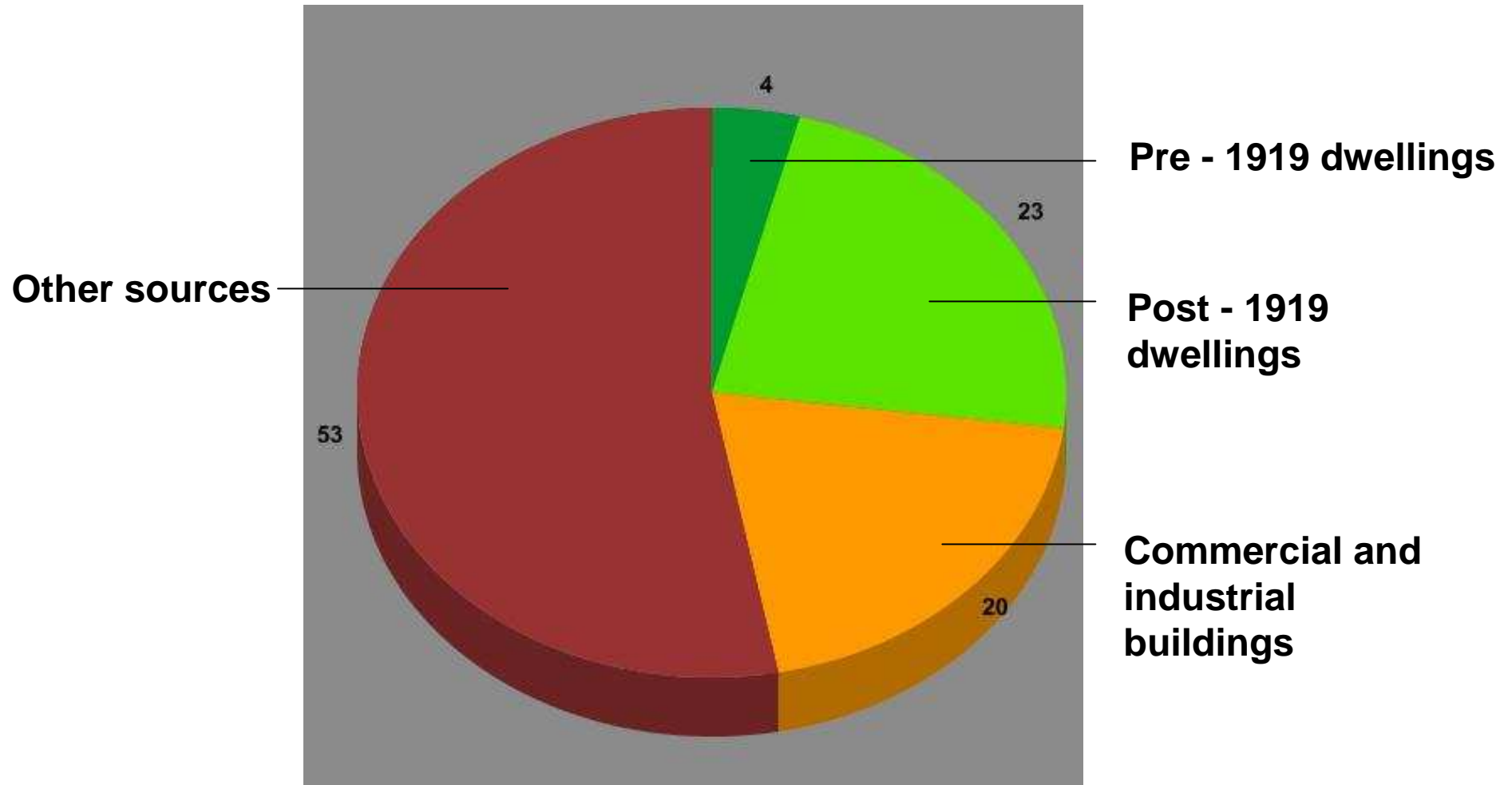
Historic Environment: Local Management HELM www.helm.org.uk

Guidance Library – English Heritage Guidance – Search Engine



**Characterisation, Climate Change, Energy
.....and much, much more**

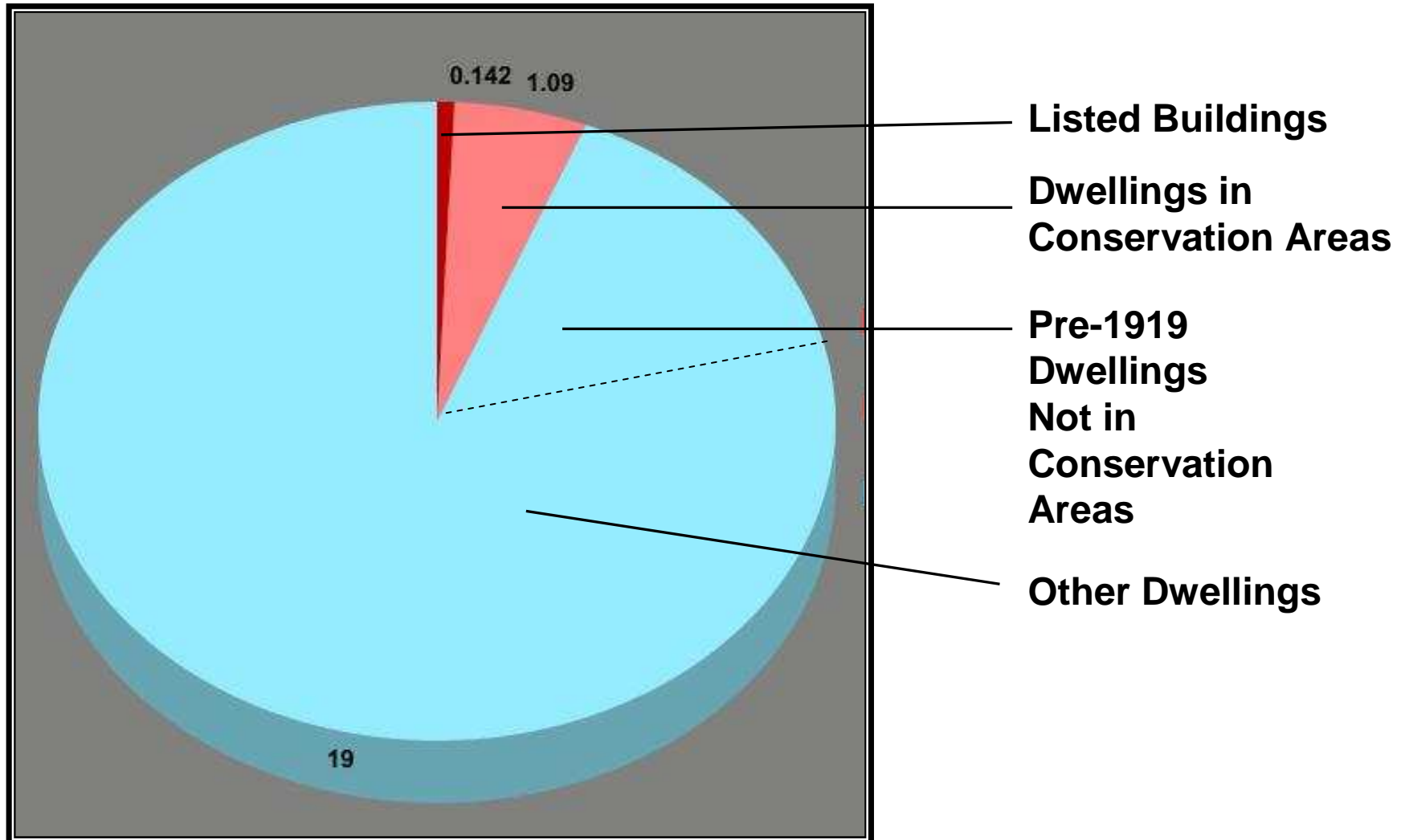
Carbon emissions - how big a contribution does the historic environment make?





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Research: Carbon Contribution of the Historic Environment

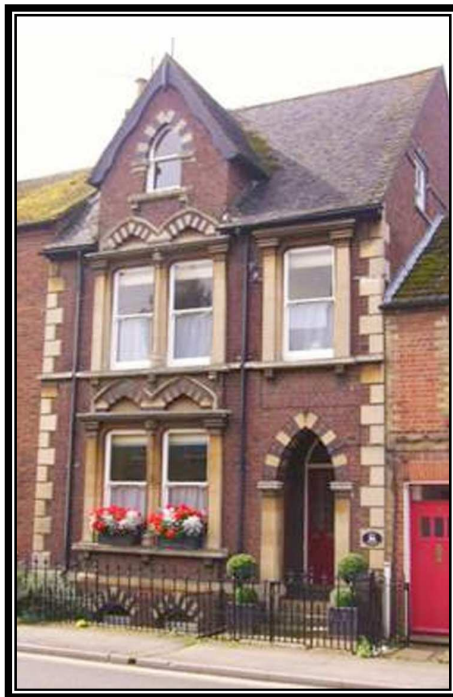




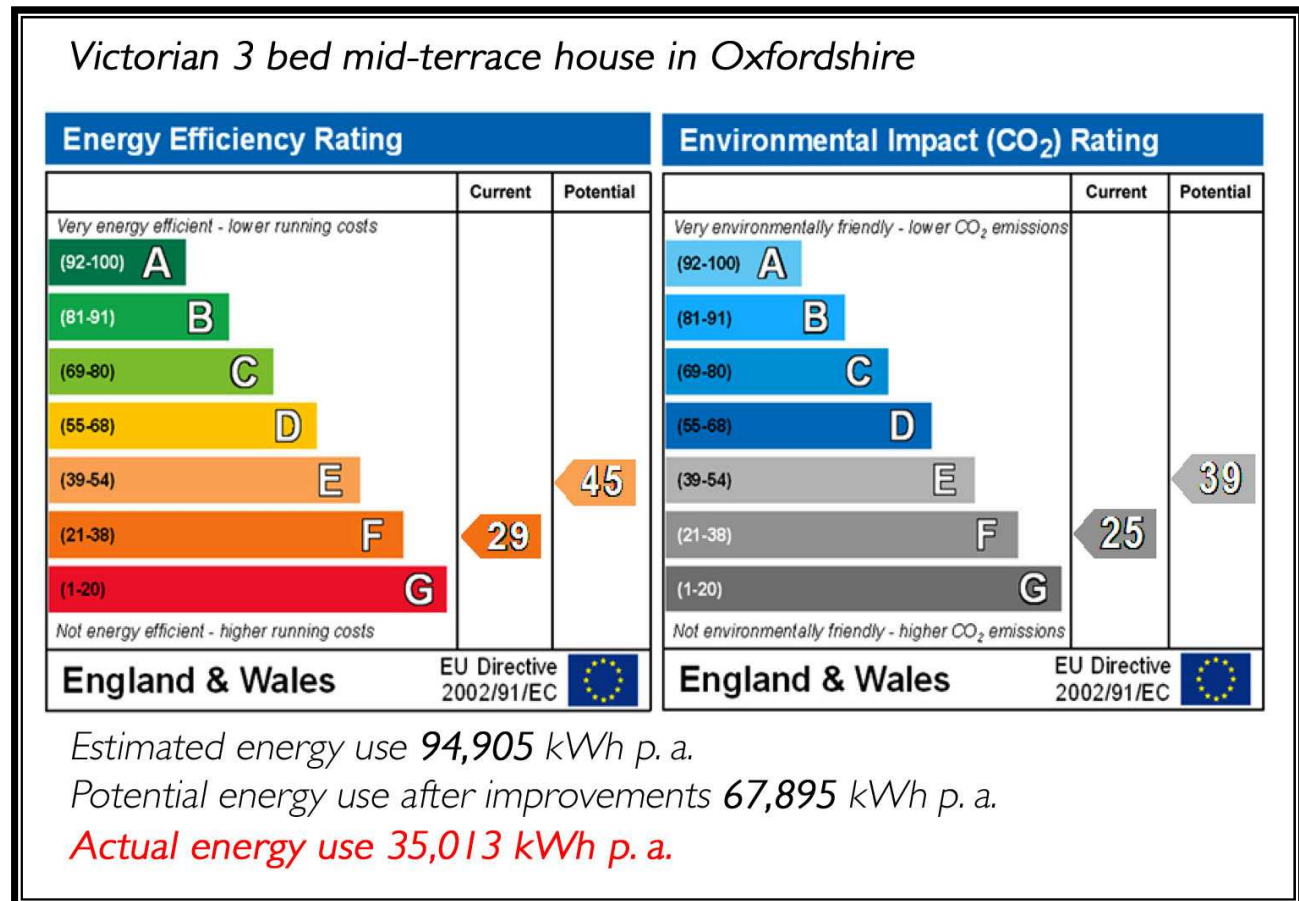
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Research: Carbon Contribution to the Historic Environment

Energy Performance Certificate Case Studies



Actual energy use
63% less than
estimated using Rd SAP





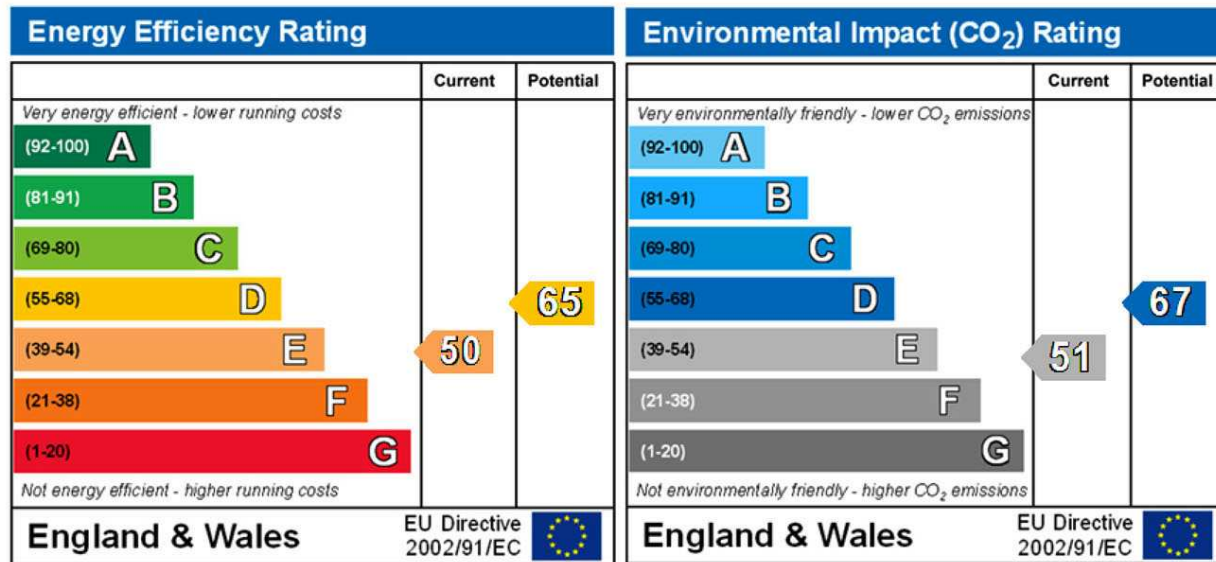
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Research: Carbon Contribution to the Historic Environment

Energy Performance Certificate Case Studies



Victorian 2 bed mid-terrace house in Hertfordshire



Actual energy use
40% less than
estimated using Rd
SAP

Estimated energy use 25,984 kWh p. a.
Potential energy use after improvements 17,806 kWh p. a.
Actual energy use 16,396 kWh p. a.



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Research: Carbon Solutions in the Historic Environment

Testing Window Options



Before and After Repair





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Research: Carbon Solutions in the Historic Environment

Option:	Reduction in heat loss:	U value W/m ² K:
Whole window with single glazing	-	4.5
Heavy curtains	41%	2.5
Shutters	58%	1.8
Modern roller blind	38%	2.7
Roller blind with low-E film	57%	1.9
'Honeycomb' blind	51%	2.1
Secondary glazing	58%	1.8
Secondary glazing and shutters	62%	1.6



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New Bolsover Model Village...



... assessing the *actual* thermal performance of traditional dwellings and the effectiveness of improvements...



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New Bolsover: case study house





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Air tightness measurements & smoke test



In situ **U-value tests** on various elements of the end terrace house.

Air pressurisation tests to determine the air-tightness of the house.

Estimation of thermal transmission value of the whole house based on the sum of the *in situ* U-values multiplied by their representative areas, combined with an estimate of the ventilation heat loss

Co-heating test to directly determine the whole house thermal transmission value.



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Retrofitting Soho

Improving the Sustainability
of Historic Core Areas



Report on a pilot study sponsored by Westminster City Council,
the Soho Community Environment Fund, The Crown Estate,
English Heritage and Shaftesbury PLC

December 2008

The Max Lock Centre

University of Westminster
35 Marylebone Road
London NW1 5LS



Retrofitting Soho 2008

- Scoping Study
 - Partners
 - Significance
- Issues
 - Heritage
 - Water
 - Waste
 - Air Pollution
 - Noise Pollution
 - Biodiversity
 - Transport
 - Economic Viability



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At the Heart of the Issue

Soho

- Most intensive energy use in the Capital
- 24-hour economy and use
- Reputation for innovation
- High visibility

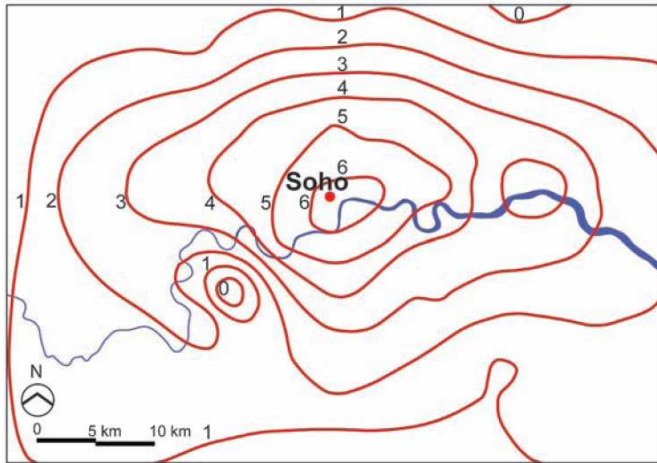


Figure 3.2: London's heat island effect

(Source: Adapted from Greater London Authority, 2006b, p4)

Right: London From Space



© Donald R. Pettit/NASA



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The Significance of Strategy



Figure 2.7: Ducting has a significant impact on the courts and alleys of Soho and Chinatown

(Source: Westminster City Council, 2005a, p58)

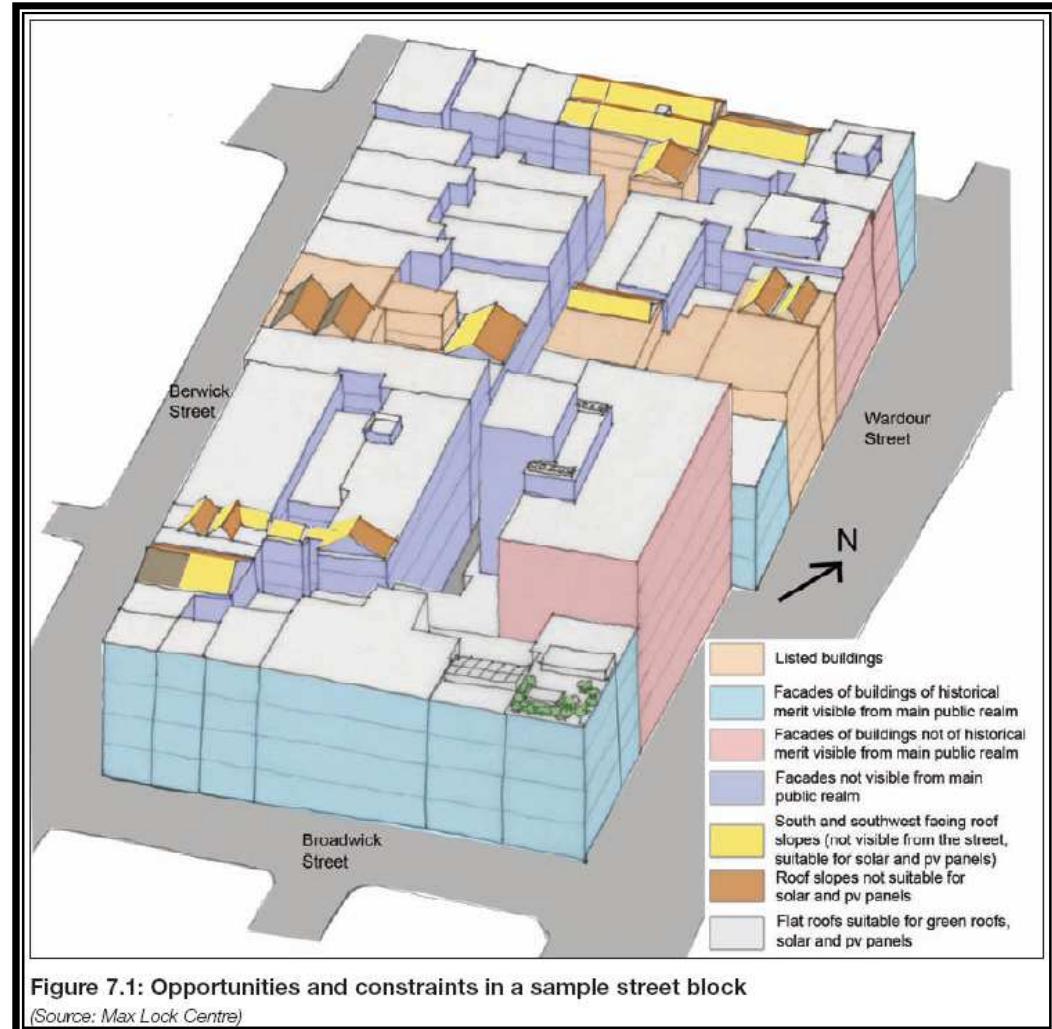


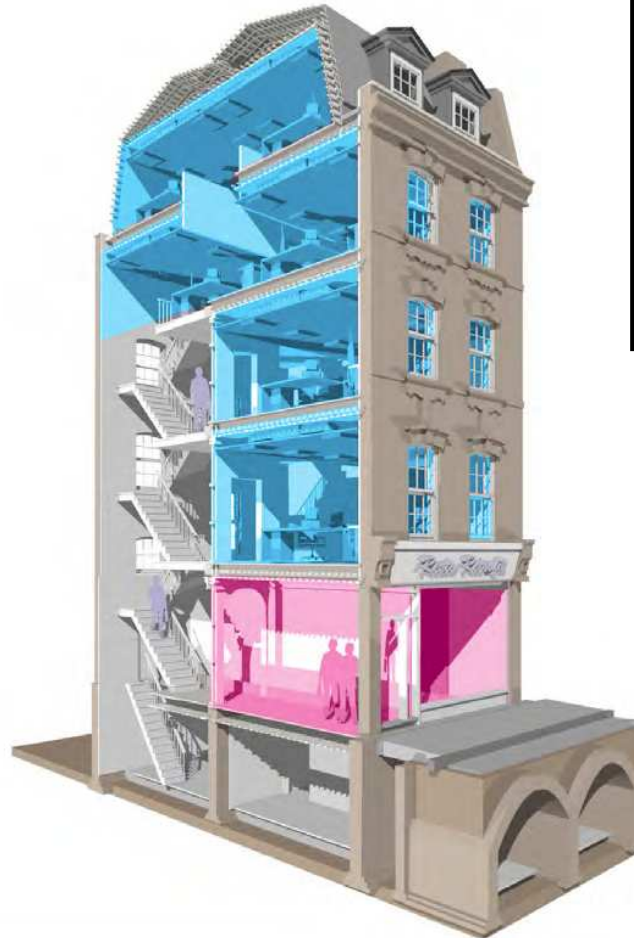
Figure 7.1: Opportunities and constraints in a sample street block

(Source: Max Lock Centre)



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Retrofitting Soho 2012





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Conservation Planning

- Understand origins, evolution and associations of a place in its context.
- Evaluate significance, as a whole and its elements.
- Identify how significance is vulnerable.
- Devise strategies to safeguard significance.
- Implement options that cause least harm to significance.
- Record
- Evaluate outcome.



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Enhancing energy performance: 'Conservation Planning' approach

1. Understand...

- *Heritage values / significance of the building*
- *Condition of building fabric and services*
- *Energy performance of building envelope and services*
- *Energy use related to operational factors and human behaviour*
- *Hygrothermal behaviour of building fabric*
- *User requirements*

Enhancing energy performance: 'Conservation Planning' approach

2. *Devise measures to conserve energy...*

'Whole building' approach:





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Enhancing energy performance: 'Conservation Planning' approach

3. Appraise options...

- *Evaluate effectiveness and value for money*
- *Assess heritage impact*
- *Assess technical risks*

4. Implement the optimum package of measures

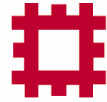
5. Monitor the outcome



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Heritage Values: Worth Sustaining





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Understanding Heritage Value



Lambton Road Conservation Area, London Borough of Merton

- Aesthetic Value: architectural homogeneity and quality
- Historic Value: property development at turn of previous century, Raynes Park expansion
- Evidential Value: Cornish connection, 'Prospect Place' estate expansion
- Communal Value: quality examples of London/English housing stock



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