

PLANNING: CATALYST OR BARRIER TO URBAN ENERGY EFFICIENCY?

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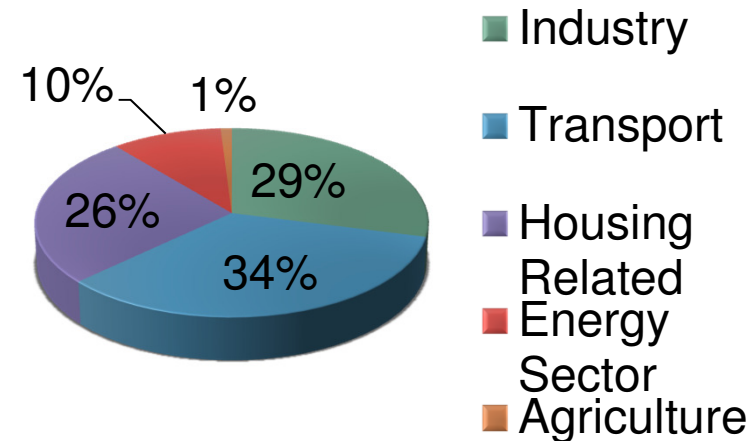
- Urban context: energy use and emissions
- Planning for energy use and emissions
- Research findings
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URBAN CONTEXT

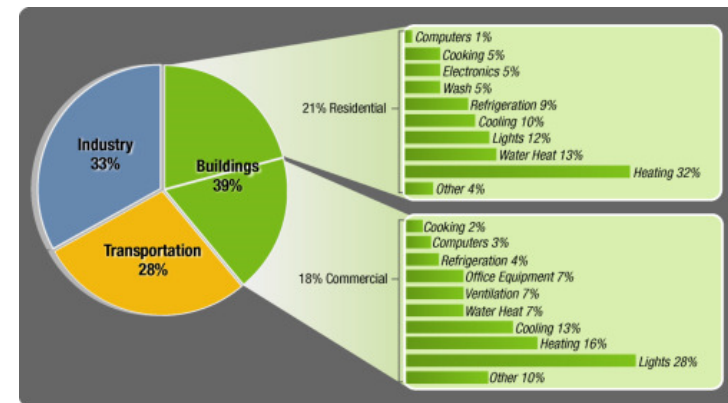
Energy use and emissions

National emission profiles

- In UK (and US) roughly 1/3 of emissions attributed to industry, transport, and housing.
- The UK 80% emission reduction target means every sector must take substantial action.
- In the built environment, energy conservation is a key enabler to meeting the reduction target.



IMECHE. 2009. *UK 2050 Energy Plan*. London: Institute of Mechanical Engineers.



US Dept of Energy (2008). *Buildings Energy Data Bookset*

Urban emission profiles

- Cities occupy 2% of the world's terrestrial surface, contain 50% of its population, and consume over 75% of its natural resources.
 - In 2005, total GHG emissions for New York City were 58.3 million metric tons of CO₂e
 - This is as much as the entire country of Ireland or Portugal
- In NYC in 2005, 79% of GHG emissions were caused by the consumption of energy by buildings in contrast to the national average of 34%.

City	% building emissions
Pittsburgh	74%
Chicago	70%
Denver	52%
New Orleans	46%



13 London Council emissions

- Total CO2 from domestic, industry, and commercial (buildings): 16,776 or **77.7%**

	CO2 tons 2008 Total	CO2 tons 2008 Domestic	Percentage CO2 from Domestic	CO2 tons 2008 Ind&Com Gas	Percentage CO2 from Ind&Com Gas	CO2 tons 2008 Ind&Com Elec	Percentage CO2 from Ind&Com Elec
Camden	1692	420	24.8%	305	18.0%	305	18.0%
City of London	1646	21	1.3%	173	10.5%	1383	84.0%
Greenwich	1233	480	38.9%	202	16.4%	237	19.2%
Hackney	899	421	46.8%	54	6.0%	237	26.4%
Hammersmith and Fullham	1071	372	34.7%	125	11.7%	386	36.0%
Islington	1205	397	32.9%	126	10.5%	526	43.7%
Kensington and Chelsea	1367	411	30.0%	185	13.5%	595	43.5%
Lambeth	1379	581	42.1%	148	10.7%	373	27.0%
Lewisham	1080	552	51.1%	57	5.2%	193	17.9%
Southwark	1672	498	29.8%	196	11.7%	700	41.9%
Tower Hamlets	2351	380	16.1%	145	6.1%	1510	64.2%
Wandsworth	1315	635	48.2%	134	10.1%	267	20.3%
Westminster	3396	497	14.6%	593	17.5%	1956	57.6%
	20306	5665	27.9%	2443	12.0%	8668	42.7%

Urban energy use per capita

- In developed countries, urban dwellers typically have better emission profiles than the national average.
- In developing countries, per capita emissions increase with new affluence.

Country/City	tCO2e/capita
Brazil	4.16
São Paulo	1.4
China	3.4
Shanghai	11.7
Netherlands	12.67
Rotterdam	29.8
South Africa	9.92
Cape Town	11.6

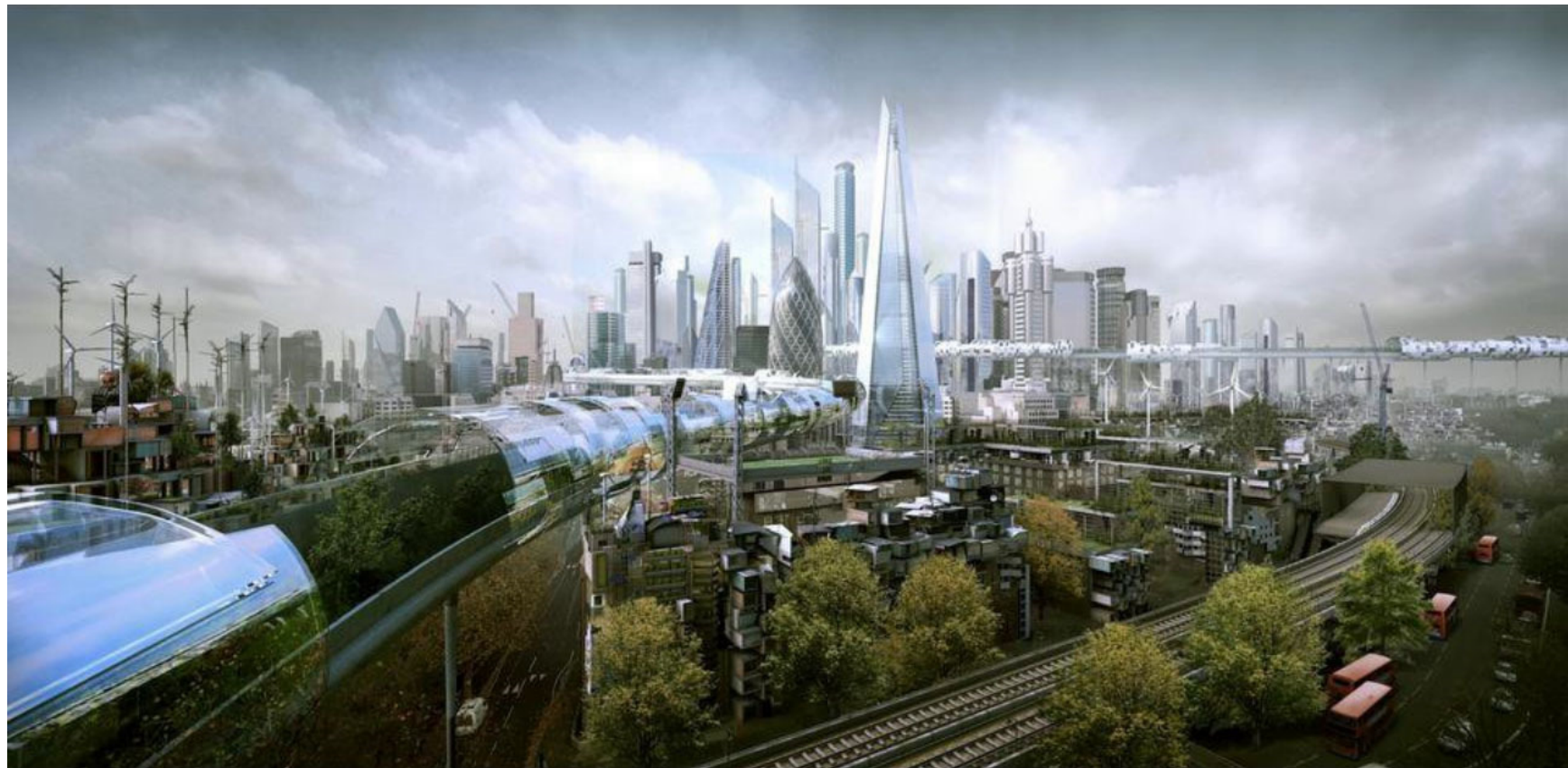
Country/City	tCO2e/capita
United Kingdom	10.5
London	6.2
Norway	11.69
Oslo	3.5
USA	23.59
New York	10.5
Japan	10.76
Tokyo	4.89

Reducing urban emissions

- An examination of a number of UK energy scenarios found agreement that **reduction of space heating through thermal improvement** is critical to meeting the energy challenge.
- As the majority of buildings expected to be in use in 2050 are already built, this must primarily be achieved through **retrofit**.
- DECC Pathways to 2050:

	Level 1	Level 2	Level 3	Level 4
Percentage Solid Wall Insulation of 2007 Properties	5%	25%	70%	96%
Year Complete	2011	2022	2040	2040
Percentage Floor Insulation of 2007 Properties	30%	45%	60%	96%
Year Complete	2050	2050	2040	2040
Percentage Triple Glazing Equivalent of 2007 Prop.	10%	35%	60%	96%
Year Complete	2022	2050	2050	2050
Percentage of Loft Insulation of 2007 Properties	5%	30%	80%	96%
Year Complete	2022	2022	2040	2040

Our future cities?



Samsung 'One Design' based on photography by Simon Kennedy

Our future cities?



London Streetmuseum



PLANNING

Governance for energy use and emission reduction

A national priority for energy efficiency

- NPPF
 - ‘Sustainable Development’
- Building Regulations
 - Part L: Conservation of fuel and power
- DECC
 - Tracking targets and shaping national initiatives
- Committee on Climate Change
 - Carbon budgets



Department
of Energy &
Climate Change



Local implementation

- Planning Applications
 - Made to the local authority
- Local Plan
 - Detailed planning policy
 - Supplementary Guidance
- Planning Officers
 - Provide advice
 - Interpret and apply national and local policy
- Building Control Officers
 - Address the building regulations.



Planning and retrofit

- Permitted Development Rights
 - Most retrofit projects do not require planning permission.
 - Can be removed through the use of Article 4 Directions.
- Common reason for building to be referred to planning is conservation.
 - Some energy efficiency measures may be harmful to heritage assets.
 - Exemptions from building regulations.

[Interactive House](#)



[Explore our interactive semi-detached house](#) for guidance on many common householder projects, including home microgeneration, in England.

[Interactive Terrace](#)



[Explore our interactive terrace](#) for guidance relating to flats, shops & basements as well as many common householder projects, in England.

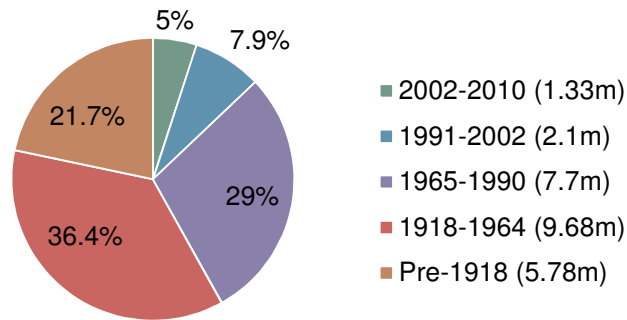
The impact of conservation

- Comparison of 13 Inner London Councils
- Lowest percentage covered by CA = 20%, highest = 75%
- Lowest emissions from buildings = 60%, highest = 95.8%

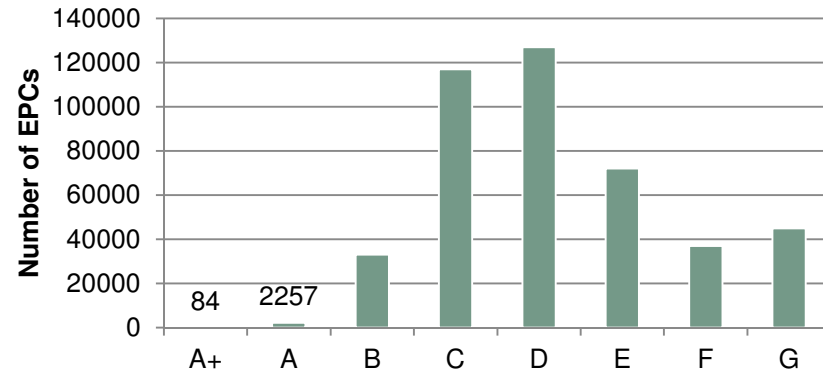
	Camden	City of London	Greenwich	Hackney	Hammersmith and Fulham	Islington	Kensington and Chelsea	Lambeth	Lewisham	Southwark	Tower Hamlets	Wandsworth	Westminster
No. Listed Buildings	5600	600	1000	1300	500	4000	3800	2000	540	2200	2050	400	11000
No. Locally Listed	No list	No list	500	395	2000	1000	No list	140	270	1910	400	475	No list
Conservation Areas (CA)	39	26	20	29	45	40	35	60	27	40	58	45	56
% Covered by CA	55	37.4	20.8	24.1	51	38	70	29	20	23.3	30.4	45	75
No. World Heritage Sites	0	0	1	0	0	0	0	0	0	0	1	0	2
% CO ₂ from buildings	60.8	95.8	74.5	79.2	82.4	87.1	60	79.8	74.2	83.4	86.4	78.6	89.7

Number and performance of older buildings

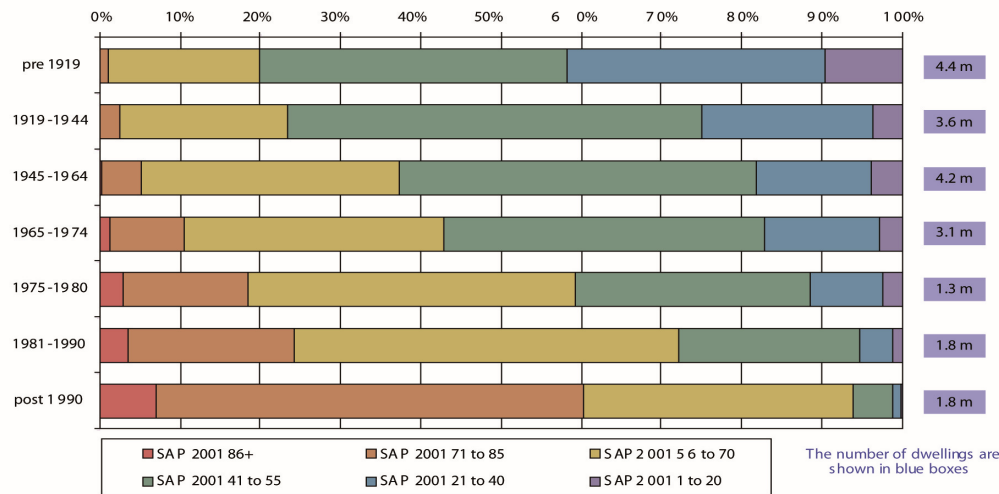
Age of UK domestic stock: 26.59 million homes



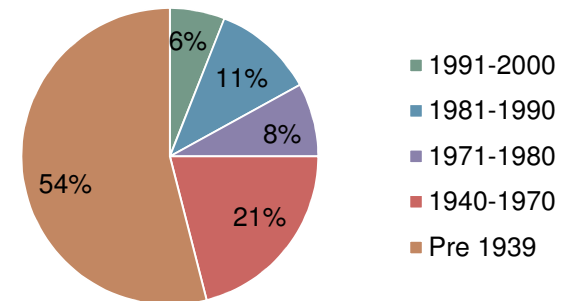
Number and rating of non-domestic EPC (2013)



Energy performance in existing dwelling stock (2004)



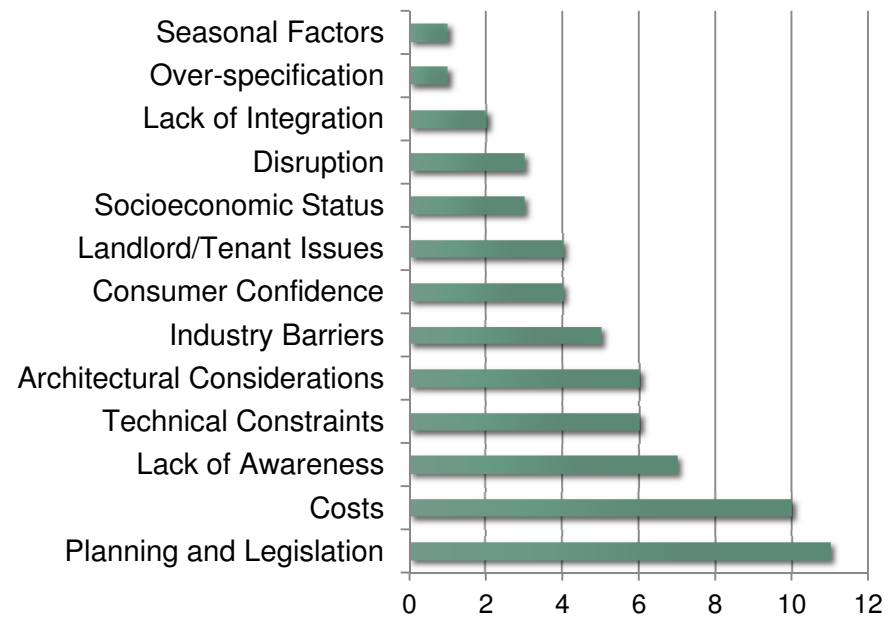
Age of UK commercial stock



RESEARCH FINDINGS

PhD research

- *“Why is planning identified as a barrier to the thermal improvement of conservation properties and how can it be addressed?”*
- Survey of planning applicants (116 responses)
- Survey of planning officers (32 responses)
- Interviews with 15 Inner London conservation officers
- Comparative information quality assessment of 13 Inner London Council websites.



Analysis of 12 Empirical UK studies of barriers to energy efficiency

Key findings

- **Local Councils are under-resourced.**
 - Budget cuts have resulted in fewer officers.
 - Higher workloads and lack of budget means officers are unable to attend training sessions or collaborate with officers from other Councils.
- **There is a lack of clear guidance on how to integrate national objectives for energy efficiency and conservation.**
 - National guidance tends to be produced by singular bodies (i.e. English Heritage).
 - Without clear guidance, Councils (and sometimes individual officers) must determine how to do it on their own resulting in very different outcomes.
- **There is a broad diversity of (sometimes conflicting) available guidance.**
 - This may lead to inconsistent advice and information.

Key findings

- **There is significant scope to improve the energy efficiency of retrofit projects.**
 - Most applicants reported a lack of energy efficiency improvements.
 - More research is needed to understand how to motivate applicants.
- **Planning is not structured to assess energy efficiency.**
 - Energy efficiency is viewed as the responsibility of building control.
 - When projects are referred to planning, there is no trained advocate for energy efficiency within planning.
- **Reduction of emissions through retrofit is not prioritised or advocated by Councils.**
 - Most advice provided on energy efficiency is about behaviour change.
 - Information provided on energy efficiency is often separate from planning and also building control.

CONCLUSIONS

Planning: catalyst or barrier?

- An application should be seen as an opportunity.
 - It may be 30 years before a building is retrofit, locking in technologies.
- **Permitted Development Rights**
 - Catalyst: Could be used to mandate more energy efficient measures.
 - Barrier: Currently some confusion regarding what is and is not allowed. Widespread use of Article 4 directions contributes to this.
- **Local Councils are well placed to provide outreach.**
 - Catalyst: Councils are often the first place looked to for advice and could utilise their position to promote and encourage energy efficient retrofit.
 - Barrier: Energy efficiency and retrofit covered by planning, building control, and environment which can be disconnected within a Council.
- **Sharing of knowledge and best practice**
 - Catalyst: In budget restricted times, it is important to be able to build on work already done, and not reinvent the wheel every time. In particular this could be coordinated by overarching city or regional level governance (i.e. GLA)
 - Barrier: The lack of shared knowledge can lead to inconsistent advice, lack of exemplar projects, and a fractured system.

Planning: catalyst or barrier?

- **There is a clear national directive to reduce emissions and improve the energy efficiency of the building stock.**
 - Catalyst: Strong national guidance and direction pushes a delivery agenda.
 - Barrier: This agenda may get lost in the transition from national to local policy without clear instructions on how to apply it.
- **The English planning system promotes the prioritisation of local issues.**
 - Catalyst: Urban Councils could target retrofit to address their individual emission reduction targets.
 - Barrier: Local Councils may not have the power to truly address local issues (i.e., retrofit)
- **Where does energy efficiency sit within built environment development governance?**
 - Catalyst: Develop specialist energy officers within planning, particularly in urban Councils.
 - Barrier: Building regulations often don't apply to the worst performing buildings.

THANK YOU
