Royal Geographical Society (with IBG)
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“Why wouldn’t we?”

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France floods: Louvre to close as Seine rises further

BBC NEWS 2 June 2016
Why would we not want London to be sustainable?

December 2013 a record high tide would have flooded London without the Thames Barrier.

It was closed 28 times in 2 months

The Barrier was built in 1982
The Stern Review on the economics of Climate Change was released on 30 October 2006.

Looking back, I underestimated the risks. The planet and the atmosphere seem to be absorbing less carbon than we expected, and emissions are rising pretty strongly. Some of the effects are coming through more quickly than we thought then

— Nicholas Stern —
Three projects at Stonebridge for Hyde Housing

The Site Context
A Phased Masterplan

1. ‘Spring’ - Site 10 (on site)
2. Recently Completed
3. Hillside Hub
4. St Michael’s Church
5. Park
6. Site 29/30 (future)
Hillside Hub, Stonebridge - a civic space, PCT, community facilities and mixed tenure residential
‘Spring’ at Stonebridge Park – 117 homes
Do we fit on the planet?

If everyone lived the lifestyle of the average Canadian, we'd need 5 planets to support our consumption.

The average Canadian =

The average European =

- Zero carbon
- Zero waste
- Sustainable transport
- Sustainable materials
- Local and sustainable food
- Sustainable water
- Land use and wildlife
- Culture and community
- Equity and local economy
- Health and happiness
London’s carbon emissions

London’s CO₂ emissions come from homes, workplaces and transport.
Currently, workplaces are London’s biggest-emitting sector, and less than a quarter of emissions are from transport. In the CCMES, all sectors must reduce emissions but workplaces are to reduce the most, leaving homes the biggest-emitting sector, with transport to reduce the least.

<table>
<thead>
<tr>
<th>Sector</th>
<th>2013 Emissions (million tonnes)</th>
<th>2025 Emissions (million tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>8.67, 22%</td>
<td>4.95, 28%</td>
</tr>
<tr>
<td>Homes</td>
<td>14.66, 36%</td>
<td>7.39, 41%</td>
</tr>
<tr>
<td>Workplaces</td>
<td>16.86, 42%</td>
<td>Workplaces</td>
</tr>
</tbody>
</table>

HOMES
Homes use energy, and emit carbon, for heating, cooling, lighting and running appliances. New homes can be built to energy-efficient standards, but existing homes require retrofitting with efficiency measures.

WORKPLACES
Workplaces have similar uses including heating, cooling and running equipment. Likewise, existing workplaces require energy efficiency retrofit.

TRANSPORT
More efficient vehicles are reducing energy use, and a shift is beginning from fuel combustion to electric power.

ENERGY SUPPLY
All sectors depend on energy supply. Getting cleaner electricity in the grid would help reduce emissions from all electricity uses.
According to the CCMES, emissions from London’s homes need to fall by about 53% by 2025. 2013 figures show a reduction of 7%, against 15% that had been expected by then. Excess emissions from 2006 to 2013 totalled nearly 7 million tonnes.

**London’s domestic emission reductions are lagging behind**

(million tonnes per year)
Most of 2025’s homes are already standing, and many have very poor energy efficiency. Retrofitting them to use less energy is crucial – it cuts carbon, reduces bills and promotes well-being.

From 2008 to 2013 the Mayor’s programmes, plus other programmes and the wider market, retrofitted about half a million homes, at about 100,000 per year. As the trend line shows, this is far too slow to deliver the Mayor’s strategy.

The current phase of the Mayor’s RE:NEW programme aims to double its rate of progress. If it delivers this, and if the wider market also doubles its delivery, and if these rates are maintained even as only harder-to-fit homes remain, then progress could catch up with the strategy in 2025.
Towards the delivery of a national residential energy efficiency programme

Creating the right conditions to halve the energy consumed in all UK homes within 25 years

May 2016
Who pays for what – is it affordable? Is it sustainable?
Fabric first approach to Near Zero Energy

In London, a typical fabric spec to comply overall with GLA energy standard (now reconfirmed as 35% better than Part L 2013) adopting PV to bring us the additional CO2 reduction to the required Level required the following fabric specifications:

Compared to SbyD values:
- **0.16**
- **0.11**
- **0.12**
- **1.4**

<table>
<thead>
<tr>
<th>Element or system</th>
<th>Gas (Package 1)</th>
<th>LPG (Package 2)</th>
<th>Oil (Package 3)</th>
<th>Electricity (Package 4)</th>
<th>Biomass [4] (Package 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walls</td>
<td>U = 0.17</td>
<td>U = 0.17</td>
<td>U = 0.17</td>
<td>U = 0.17</td>
<td>U = 0.17</td>
</tr>
<tr>
<td>Floors</td>
<td>U = 0.15</td>
<td>U = 0.15</td>
<td>U = 0.15</td>
<td>U = 0.15</td>
<td>U = 0.15</td>
</tr>
<tr>
<td>Roofs</td>
<td>U = 0.11</td>
<td>U = 0.11</td>
<td>U = 0.11</td>
<td>U = 0.11</td>
<td>U = 0.11</td>
</tr>
<tr>
<td>Openings [5]</td>
<td>U = 1.4</td>
<td>U = 1.4</td>
<td>U = 1.4</td>
<td>U = 1.4</td>
<td>U = 1.4</td>
</tr>
</tbody>
</table>

Ex Section 6 Technical Handbook (Domestic)
Example – AIMC4 feedback: prototyping at this standard was estimated at + ~3% cost – negligible for mass uptake

Lessons learned

The key lessons learned from the technical development of the project are:

- At this level of performance party walls must be ‘zero U-value’.
- A U-value of around 0.15 appears optimal for masonry and SIP solutions when weighing up cost and buildability.
- Obtaining good thermal bridging solutions is a cost-effective way of achieving good fabric.
- For site installation, triple-glazed windows and double-glazed French doors should be the new standard.
- For most houses the service solution appears to be either an MVHR unit or a WWHR unit with an MEV unit.
- The timber-frame option used at Preston had an improved U-value for the walls. This gave Stewart Milne Group the option of designing out MEV and allowed the more conventional ventilation solution of intermittent fans in kitchens and bathrooms to be used.

Cost

<table>
<thead>
<tr>
<th>Developer</th>
<th>Site</th>
<th>No. Homes</th>
<th>Type Homes</th>
<th>Build Method</th>
<th>Build Time (Weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stewart Milne Homes</td>
<td>Portlethan</td>
<td>2</td>
<td>Detached</td>
<td>Sigma II Closed Panel</td>
<td>20</td>
</tr>
<tr>
<td>Stewart Milne Homes</td>
<td>Prestonpans</td>
<td>3</td>
<td>Terraced</td>
<td>Sigma II Closed Panel</td>
<td>9</td>
</tr>
<tr>
<td>Stewart Milne Homes</td>
<td>Preston</td>
<td>3</td>
<td>Terraced</td>
<td>Sigma OP-4 Open Panel</td>
<td>13</td>
</tr>
</tbody>
</table>
Unpacking the Health and Wellbeing agenda – User Thermal Comfort & IAQ

- Previous monitoring work by GHA

**APPG for Healthy Homes and Buildings:**

- Airtight Homes and air quality
- User awareness: lifestyle; usability
- Source Control of pollutants; specification of materials and LCI criteria
- Effective ventilation
Unpacking the Health and Wellbeing agenda – Thermal Comfort; Overheating

How do we get the media to shift from encouraging us to buy stuff that we neither need nor can afford and work together to make our city sustainable?
The Challenges of the Performance Gap

1. Transparency of data, comparability
2. Energy Literacy – Skills and Training
3. Improved Quality Control
4. Continued Evidence Gathering

Also needs to encompass:

5. Understanding and learning from user feedback

eg “Complex controls were often not understood by occupants, so best intentions in specs of intelligent controls got lost..”
Edge Futures published our five provocative takes on insights into the next 20 years. Geoff Mulgan (then of Young Foundation) authored this one...

... on Wellbeing: “...Work is underway in many cities around the world to define new metrics of well-being...several of the strands are very much about place – including one exploring the data which shows that happiness levels correlate with how well you know your neighbours, and another seeking environmentally useful actions that also make people feel good about themselves and their communities.” 2008
Figure 1: Land Cover in London

LONDON is.....

Areas of Land
- 9% Domestic Buildings
- 24% Domestic Gardens
- 38% Open Greenspace
- 5% Non-Domestic Buildings
- 8% Other Land Uses
- 1% Footpaths
- 1% Railways
- 12% Roads
- 2% Open Water
PROMISE TO PLANT

Help us transform 6,000 grey spaces into living planted places by the end of 2017.

I promise to turn a grey area green by planting a…
#IslandEstate
#GreenSkyThinking

@CullinanStudio
UK average: 5.5

*includes long-haul flights
“Why wouldn’t we”

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