

Not Sustainable Enough!

Submission by Enfield Green Party to Enfield Council on its Sustainability Strategy – Enfield 2020 – final

The last fifty years have seen great advances in many areas. Unfortunately the combination of increasing population, increasing prosperity and reckless irresponsibility about environmental impacts has had terrible impacts on the natural environment and on our ability to maintain our standards of living and well-being.

Enfield Green Party believes that future generations will look back on this period with amazement and horror. We therefore welcome the emphasis that the Council is placing on sustainability. The Enfield 2020 sustainability programme and action plan are wide-ranging and very ambitious; as befits this vital issue.

Although sustainability has many aspects one exceeds the others in urgency and importance – greenhouse gas emissions. Our comments will therefore concentrate on this issue, and especially on one aspect on which the Council has real influence – buildings.

Carbon emissions from buildings

The Council recognises that most of the buildings that we'll be using in 2050 have already been built. It follows that these buildings will, taken together, have to meet the national 80% reduction target¹. Since the number of dwellings is increasing at about 0.7% per year (and needs to increase faster if we are to meet the needs of an increasing population) and people wish to keep their houses warmer², the emissions from individual buildings must fall by more than 80%. Indeed, if greenhouse gas emissions and fossil fuel prices continue to rise they will need to meet even more demanding targets.

Since about 80% of the 2050 housing stock has already been built the REFIT and RENEW projects are of the first importance. However, it is difficult to pioneer the radical new approaches needed on renovation work so we will start by considering new build. We recognise that the Council is trying hard in difficult circumstances. Nevertheless, we believe that the targets are too modest and the strategy inappropriate.

The Council's approach to reducing CO₂ emissions from new buildings has five elements:

1. Compliance with relevant Building Regulations, such as Part L2A. The regulations specify a method of calculating energy requirements (called SAP 2009) and a target requirement that must not be exceeded.
2. Local policies requiring buildings to need much less heating energy than the target requirements of (1)³

¹ Enfield 2020, p 11.

² Palmer and Cooper, 2011, p 27.

³ DMD. Policy 50 (page 104)

3. Verification of the builders' estimates of energy performance through compliance with schemes such as the Code for Sustainable Homes (CSH) and BREEAM⁴.
4. A requirement to "Maximise fabric energy efficiency and the benefits of passive design"⁵ in preference to, eg, installing solar panels.
5. A move to "Zero Carbon" by 2016.

Though this is fairly conventional each element is at least partly misconceived:

1. The performance targets under (1) and even (2) are insufficiently ambitious. A development can be approved even though it requires more than three times as much heating energy as best practice⁶.
2. In a very recent paper⁷ Bruce Tofield of the University of East Anglia has pointed out that buildings that comply with low-energy standards on paper generally do not achieve the implied energy efficiency. He calls this the 'performance gap' and its recognition is the key to effective policy making in this area. A study⁸ of five supposedly low-energy buildings found that actual energy use (and thus CO₂ emissions) exceeded predicted use by an average factor of three (and six fold in one case!). Several other studies show similar results. This is mainly due to poor practice in the UK construction industry.
3. Element 4 would be a powerful tool for reducing energy use if it meant what it appears to mean – achieving the lowest practical level of energy use by the stated means. But it doesn't. It means doing so subject to a test of financial viability and Council officials have made it clear that they regard the highest performance as unaffordable despite increasing evidence⁹, such as the Wolverhampton experience cited below, to the contrary. And despite the fact that high performance will reduce users' costs every year.

It is therefore clear that insistence on compliance with the first four elements listed above is **not** a way of reducing energy use to the required degree. Indeed, even winning an environmental award is no guarantee of energy efficiency. The 'Green Building of the Year' for 1996 also used three times as much energy as expected¹⁰!

Element 5: Moving to Zero Carbon

The Council will require major developments to "move toward zero carbon" by 2016 for residential and 2019 for non-residential developments. This sounds good but its actual meaning is unclear. If it refers to the Zero Carbon Hub's definition of "zero carbon" then it will be relatively ineffective since recent revisions to the definition seem intended to avoid requiring changes in industrial practice. An assessment by researchers at Cardiff University¹¹ shows that it permits carbon offsetting (a

⁴ DMD para 9.1.4.

⁵ DMD Policy 50 (page 104)

⁶ See, for example, the current development in Drapers Road Enfield.

⁷ Tofield, Bruce, 2012. p21, 63.

⁸ Gardiner et al, 2011. Fig 32.

⁹ Tofield, 2012. Section 1.4.

¹⁰ Curwell et al, 1999.

¹¹ McLeod, 2012.

notoriously unreliable approach) for up to 50% of net emissions and is not consistent with DECC's own modelling.

In short, it won't produce the required 80%+ reduction! Current definitions enable the industry to avoid those quality improvements¹² that alone can deliver real energy savings. According to the Cardiff team: *"implementation of an advanced energy efficiency standard (such as the Passivhaus standard ...) is the only approach that leads to a long term reduction in the total domestic heating demand."*

Therefore, if Enfield Council is sincere in its desire to reduce building emissions it must adopt a strategy that will work rather than the current one, which won't.

Passivhaus

At present the only proven way of achieving the required efficiency is to apply the lessons of passivhaus experience¹³. These lessons are the necessity of:

- ⌚ A clear and appropriate brief
- ⌚ Realistic modelling of building performance
- ⌚ A final design before construction begins
- ⌚ Teamwork throughout the project
- ⌚ Attention to construction detailing
- ⌚ Simple building operation (even if there is innovation in design)
- ⌚ Post-construction evaluation.

And, unsurprisingly, the easiest way to do this is to follow the passivhaus method¹⁴. The key insight here is that passivhaus is not a bag of clever tricks. It is a design philosophy based on treating the building as a single integrated system and a building process based on quality and collaboration. Though there is not much passivhaus experience in the UK there is enough to know that it can be done. (Successful projects include Oak Meadow and Bushbury Hills Primary Schools in Wolverhampton^{15 16} and a group of 14 dwellings in Wimbish, Essex¹⁷. Camden is currently building 55 passivhaus dwellings in Highgate¹⁸.) This year the Passivhaus Trust named Wimbish the "best domestic residential passivhaus scheme". And there's a great deal of experience in other parts of northern Europe.¹⁹

It's worth emphasising the key difference in energy efficiency:

- ⌚ Current buildings require c160 kWh/m²/year for heating on average.
- ⌚ The Zero Carbon Hub suggests that 'zero carbon homes' should need no more than 45 kWh/m²/year. However, given the performance gap, they might need much more in practice.
- ⌚ Passivhaus buildings require no more than 15 kWh/m²/year.

¹² Tofield, 2012, p 32.

¹³ Tofield, 2012, Section 3.

¹⁴ http://www.passivhaustrust.org.uk/what_is_passivhaus.php

¹⁵ <http://blog.emap.com/footprint/2011/11/02/first-look-two-passivhaus-schools-by-architype/>

¹⁶ Video: <http://www.youtube.com/watch?v=MffKNX5qLw&feature=plcp&context=C23be7UDOEgsToPDskIbKRra26JoGTqORzd-9ICJA>

¹⁷ Wimbish Passivhaus, 2012.

¹⁸ CNJ

¹⁹ http://passipedia.passiv.de/passipedia_de/grundlagen/was_ist_ein_passivhaus

- ⌚ That's an energy saving of over 90%.

It's important to recognise that this goal can be met without extra cost and that doing so produces buildings that are pleasanter and in which people can be more productive. Passivhaus is a win-win-win strategy! Good for people, climate and the economy.

New build

Enfield Green Party strongly recommends that Enfield Council should:

1. Require all new Council-funded buildings commissioned after April 2013 to use passivhaus.
2. Make passivhaus-equivalent performance (especially the requirement that space heating should need no more than 15 kWh/m² pa) a Planning approval condition for all new buildings. Developers who claim to achieve this performance without fully adopting passivhaus should be required to (1) demonstrate that their plans will achieve this, (2) pay for a post-occupancy energy audit and (3) pay the buyer's compensation for any expected excess energy use over the first 30 years of occupancy. In estimating energy performance it should not be sufficient to rely on SAP2009 calculations.
3. Work with local developers and building professionals to ensure that they understand the new standards and how to achieve them. It may, in order to encourage the Greening of the local construction industry, be appropriate to subsidise some professional training.

Renovation

It will not be possible to set such high standards for renovation and improvement work. However, many parts of the passivhaus method can be applied in such work. The Council should therefore seek independent advice on the best way to set passivhaus-style standards for such work. We note that Camden Council has published guidelines on a variety of energy-saving methods²⁰.

Reporting

The Council should report annually on its progress, including actual energy savings, in these areas.

Conclusion

We recognise that our recommendations imply a radical change in construction practice within the borough and that this will be resisted by many in the construction industry. We know that such a radical change is disruptive and should not be needed. However it is needed and would not be so urgent if it had been made when the need was first apparent – 10 or 20 years ago!

Since it is needed we think the Council should see it as an opportunity to stimulate the creation of a new, Green, industry which will have many benefits for the Council, the borough and beyond.

References

²⁰ Camden 2011.

Bordass, et al, 1999: **PROBE Strategic Review 1999, Final Report 2: Technical Review**, Bill Bordass, Robert Cohen and Mark Standeven,
<http://www.usablebuildings.co.uk/Probe/ProbePDFs/SR2.pdf>.

Camden 2011: **Retrofitting Planning Guidance**. June 2011.
www.camden.gov.uk/ccm/cms-service/download/asset/?asset_id=2724787

CNJ: **Green Chester Balmore Estate Gets Off Ground**. Camden New Journal, 7/11/2012. <http://www.camdennewjournal.com/news/2012/mar/green-chester-baltimore-estate-gets-ground>

Curwell, S, Yates, A, Howard, N, Bordass, B and Doggart, J, 1999: **Green Building Challenge in the UK**. Building Research+Information, 27(4/5) p286-293.
DOI:10.1080/096132199369390

DMD, 2012: **Development Management Document**, 2012 draft. Enfield Council.
http://www.enfield.gov.uk/info/200057/planning_policy/1896/development_management_document_dmd

Eek, Hans, 2010: **Passivhuscentrum Newsletter No 6**, February 2010, English language version.

Enfield 2020: **Enfield 2020 sustainability programme and action plan**. London Borough of Enfield. <http://governance.enfield.gov.uk/mgIssueHistoryHome.aspx?Iid=31049>

Gardiner et al, 2011: **Low Carbon Building Programme 2006-2011, Final Report**, Mike Gardiner, Helen White, Monika Munzinger and Will Ray, Department of Energy & Climate Change (DECC), August 2011,
<http://www.decc.gov.uk/assets/decc/11/funding-support/fund-opportunities/2578-lcb-programme-2006-11-final-report.pdf>.

McLeod, Robert S., Hopfea, Christina J. and Rezguia, Yacine, 2012: **An investigation into recent proposals for a revised definition of zero carbon homes in the UK**. Energy Policy, 46, July 2012, Pages 25–35.

Palmer, Jason and Cooper, Ian, 2011: **Great Britain's housing energy fact file**. DECC.
<http://www.decc.gov.uk/assets/decc/11/stats/climate-change/3224-great-britains-housing-energy-fact-file-2011.pdf>.

Standeven, M, et al, 1998: **PROBE 14: Elizabeth Fry Building**, The PROBE Team (Mark Standeven, Robert Cohen, Bill Bordass and Adrian Leaman), Building Services Journal, April 1998, ppE20-E25.

Tofield, Bruce, 2012.: **Delivering a low-energy building: Making Quality Commonplace**. Adapt Low Carbon Group, University of East Anglia, October 2012.
<http://www.uea.ac.uk/mac/comm/media/press/2012/October/passivhaus-bruce-tofield>

Wimbish Passivhaus: Building Performance Evaluation Interim Report –March 2012. Build with Care. UEA.
http://www.buildwithcare.eu/images/pdfs/wimbish_passivhaus_interim_report_march_202012.pdf