ASBP The Alliance for Sustainable Building Products

UKGBC Zero Carbon 2019 - Non Domestic Task Group

ASBP contribution to the consultation process

Submitted 14th January 2014

Summary

The ASBP contribution is confined to consideration of embodied impact.

Our key concern about the UKGBC task force recommendations, in particular their road map, is that it appears to put the cart well before the horse. Their conclusion appears to be that the order of priority for inclusion in the zero-carbon definition should be:

Firstly, over door heaters, lifts and escalators

Secondly, unregulated energy (ancillary equipment associated with building use)

With embodied carbon being considered too complex and embryonic to be included at this stage (but could perhaps be introduced into the definition at some later date)

This is not only illogical at the most basic level, putting guesswork about the future ahead of current auditable performance of delivered products, but also prioritises small gains in future energy use over the large, and growing, percentage of energy embodied in components at and before initial build.

The embodied impact opportunity

The ASBP considers that there are substantial economic, social and environmental benefits that flow from a focus upon resources, products and materials, and how they are deployed in construction. Such as:

- More, component based, off-site and re-usable construction, encouraging designing for deconstruction and re-use (with consequent reductions in resource use), and helping to close the gap between design and actual building performance. These efficiencies were described in both the Latham and Egan reports, but remain largely absent from UK construction
- Re-using structural components e.g. steel

- Wider specification of more resource efficient and insulating products e.g. clay and cellular glass blocks
- Greater use of biogenic building materials such as wood, wool, straw or hemp. These materials lock up atmospheric carbon helping increase the size of the carbon store. Their increased use also allows subsequent development of sustainable supply chains (See ASBP output on sequestered carbon).
- Increased specification of UK home-grown timber. In many cases home-grown timber is of equal quality to imported timber but currently meets just 15% (approx) of UK construction related demand
- Encourage market demand for low carbon concrete and ensure (in line with a resource efficient approach) that concrete is only specified when it is appropriate and necessary. The impact of low carbon concrete is recognised at the European level and acknowledged by Josephine Lindblom who states *'An investment of 100,000 Euros in PV would save 75 tCO2 over 30 years. An equivalent investment in low carbon concrete would save 663 tCO2 immediately. Which investment is being made?'* **(**Josephina Lindblom, Sustainable Production and Consumption, Director General for Environment).
- Reduced negative impacts on public health through the increased use of healthier materials (improved indoor air quality through reduced harmful VOC emissions and reduced harmful or toxic waste to landfill)
- Clear public standards would provide a framework for a range of supply chain improvements delivering secure economic, social and environmental benefits beyond those currently served by narrow short term market drivers. These might include increased domestic forestry activity to service specialist processing and construction demand, with consequential increases in biomass fuel supply as a bi-product, and reduced import dependency.
- Reducing embodied impacts extends beyond reductions in production energy, to resource efficient production, design and specification. With respect to embodied impacts, the current market tends to the lowest common denominator in many or most situations. We need to reverse this tendency by creating market incentives that encourage an innovative approach from manufacturers and an acceptance of the value of these innovations throughout the supply chain.

The ASBP view

Ambitious reductions in carbon levels require a concerted effort in the fields of both operational and embodied carbon in equal measure if we are to avoid 'robbing Peter to pay Paul'. If ambitious targets for the reduction of operational carbon are not matched by those for embodied carbon there is a great risk that any gains in operational carbon will be offset by losses in embodied carbon.

Policy drivers that influence embodied impact include Green Construction Board targets as described in their Route-Map and emerging Resource Efficiency requirements from Europe.

In the UKGBC consultation document the issue of embodied impact is side-stepped through the following statement:

'the clear need to tackle embodied (or capital) carbon emissions in the built environment has been robustly stated by the Green Construction Board in their Low Carbon Route-map for the UK Built Environment. In light of this, there is the potential for embodied carbon to be brought into the definition of zero carbon non-domestic buildings. However, the tools and data for embodied carbon measurement and reporting are relatively embryonic and arguably there is not yet the necessary industry consensus on scope and boundaries for embodied carbon assessment of buildings to be able to robustly include this issue in the definition at this stage."

We accept that embodied impact assessment is a growing and developing field but to ignore the issue on this basis is extremely short sighted. Adequate tools and standards already exist[1] to enable meaningful embodied impact assessment in almost all situations. It is neither sensible nor appropriate to wait for 'industry consensus' – which will only be resolved when industry is required to report.

The ASBP believes that we need regulations which acknowledge uncertainties and complexities and promote learning and best practice. It should be remembered that there still remains much uncertainty and disagreement around the models and standards for measuring operational energy. However, this uncertainty did not stop the Building Regulations introducing provisions to conservation of fuel and power 40 years ago.

Also, as a supporter of BREEAM and the Code for Sustainable Homes (CfSH), UKGBC already endorses an established embodied impact assessment methodology. Both BREEAM and CfSH require reference to the Green Guide to Specification for component embodied impact. Although deeply flawed (and the subject of a detailed ASBP critique) The Green Guide to Specification is in effect an embodied impact (including carbon) standard based upon life cycle analysis. So it is, at best, inconsistent to consider that the understanding is too 'embryonic' to enable the inclusion of embodied carbon in the zero carbon definition.

It is our view that embodied carbon impacts of products and materials should be addressed as a matter of priority as suggested by the Green Construction Board for the following key reasons.

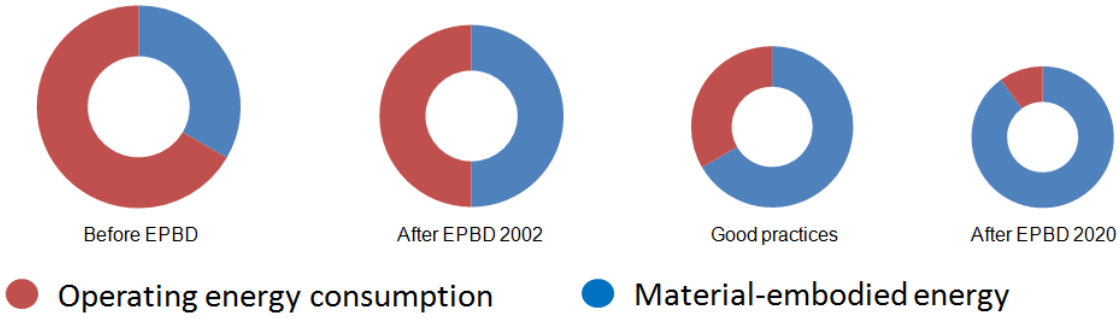
- **Reinforcement of appropriate behaviour across the supply chain**. While many product manufacturers pursue improvements in sustainable procurement, manufacture, design and performance of their products, the appropriate "pressure point" to encourage and reward these improvements is at the point of commercial transaction i.e. when products are selected and purchased for use in buildings.
- **Reinforcement of appropriate behaviour by builders**. While huge strides can be made in the embodied impacts and performance of materials, this is only effective if those products are correctly specified and used, individually and collectively. The much vaunted "performance gap" is not just a result of inconsistent construction, but significant degrees of "value

[1] eg. RICS Methodology to calculate embodied carbon, GLA Construction Scope 3 (Embodied) Greenhouse Gas Accounting and Reporting Guidance, IES Impact compliant suite, BLP's Butterfly tools and the again freely available ICE database, PAS 2050.

engineering" where the qualities of specific products (technical performance and embodied impacts) are sacrificed for cost saving.

- **Scale**. As building energy performance improves, the importance of embodied impacts will grow proportionately and is expected to represent up to 90% of lifetime emissions (see Figure 1 below). These embodied emissions can be managed through a range of measures including improved manufacturing processes, extended product life and the re-use of products in multiple buildings. There is also an opportunity for the net sequestration of carbon through the use of biogenic building materials, with research by ASBP (for DECC) showing that this could exceed the scale of the entire Zero Carbon Homes policy by 2020 if correctly adopted.

Figure 1: Lifetime CO2 emissions of new European Buildings before and after Energy Performance of Buildings Directive (EPBD 2002) (credit: World Green Building Council)



- **Measurement.** While the measurement of embodied impacts is still the subject of much debate, its advancement and impact is better served by an iterative and practical approach based upon current need. Postponing the use of embodied impact measures will delay the improvement and integration of existing measures and will delay the active engagement of the supply chain who history suggests are most likely to contribute both data and practical improvement when there is a mechanism for recognition and reward.

Conclusions

Savings made in embodied impact happen now (at least for cradle to site assessment) – they are measurable and cannot be lost through differences in occupier behaviour or new types of technology or behaviour coming along (as with existing building regulations or potential regulation in the area of unregulated emissions).

Pressure to reduce embodied impact does result in innovation and significant reductions in impact by manufacturers. Increasing the likelihood of future regulation in the field of embodied impact means that there is more incentive for forward looking companies to invest in these types of changes so that they are ahead of the competition, and gives them more tangible competitive advantage from this investment.

The Netherlands has enforced the reporting of embodied carbon (and abiotic depletion) for all new housing and offices over 100m^2. This has been on the back of the development of a national database and national method (based on EN 15804) and a number of authorised tool providers who have adapted their existing tools to use the database and method. This would not be expensive to achieve in the UK, but would be required for regulation in this area.

The UKGBC task force rightly identifies the opportunities inherent in the forecast adoption of BIM for achieving extensions of carbon performance in buildings beyond the current focus on energy in use. An additional concern is that the priorities for the areas of performance which UKGBC wishes to address are inappropriate and run the risk of generating an additional set of theoretical gains where ancillary and occupant equipment is estimated to save carbon, yet the measurable carbon used in its production is not considered in the decisions around whether or what to install.

Failure to address embodied impacts of building products and materials undermines the very starting point for the assessment of the lifecycle of any building, the provable impacts at point of build. This failure, in a world where packets of crisps carry a carbon footprint, would leave any BIM carbon claims standing on very shaky foundations.