BRE response to Lords Science and Technology Committee - Waste Reduction

The BRE Group is a world leading research, consultancy, training, testing and certification organisation delivering sustainability and innovation across the built environment and beyond.

Our mission is to 'Build a better world'. We help our clients create better buildings and communities and solve problems with confidence.

BRE Centre for Resource Efficiency

BRE's Centre for Resource Efficiency actively seeks to work with organisations that share their objective of: **Reduce environmental impacts and costs through resource efficiency**

BRE's Centre for Resource Efficiency is continually developing its capabilities as a world-leading centre of expertise on waste auditing, waste minimisation and waste management in the construction, demolition, refurbishment, manufacturing and related industries. The Centre provides a one-stop-shop of integrated solutions to the whole supply chain on all aspects of material waste including research, consultancy, testing, re-engineering and specifying. The Centre has pioneered best practice in construction resource efficiency with a range of different projects, services, techniques and software tools available to the industry.

We have considered each of the issues raised in this inquiry and have included a response where appropriate

Better design and the use of materials

Design and the use of materials

Design could play an important part in achieving waste reduction in the built environment. However, there are a multitude of considerations in addition to resource efficiency that take priority. These include look, design life, whole life cost, skills, time, operational energy and water use, life cycle impacts of materials to name but a few. Resource efficiency needs to be embedded within this overall design decision making to avoid being a sidelined activity. Simple messages on waste reduction and design include:

- precut materials delivered to site
- off site fabricated products
- specifying materials with lower wastage rates on installation, lower hazard content, fit for purpose and design life.
- design for deconstruction, repair and refurbishment
- long lived and durable buildings (avoiding design that becomes easily dated/ shabby)

Sustainability and the use of materials

In the context of life cycle assessment, waste issues form part of the overall assessment. If these issues are separated and focussed on without this overall context, there is a risk that overall environmental impact could increase. It is important that waste is considered, along with resource efficiency, within the wider sustainable consumption and production agenda. Energy use and water use are other key environmental impacts to consider.

We propose adopting a decision making hierarchy that enables:

- overall life cycle impact to be considered as a first priority
- single impacts to be focussed on and improvements made
- reiteration of overall life cycle impacts following single impact improvements

Life cycle assessment (LCA) is basically the combined effect of single impacts. Therefore, it could be concluded that material resource efficiency measures will affect the LCA result in a positive or negative way. If the result is positive then these measures should be accelerated.

This is fine in principle, if all products and processes have reported in terms of LCA and it is easy to extract the data relating to single impacts. Many construction products do not have a Type III environmental declaration1. It is also difficult to see how LCA in the construction products field will drive forward material resource efficiency measures. This is partly due to incomplete LCA data, but also due to the weighting allocated to impacts.

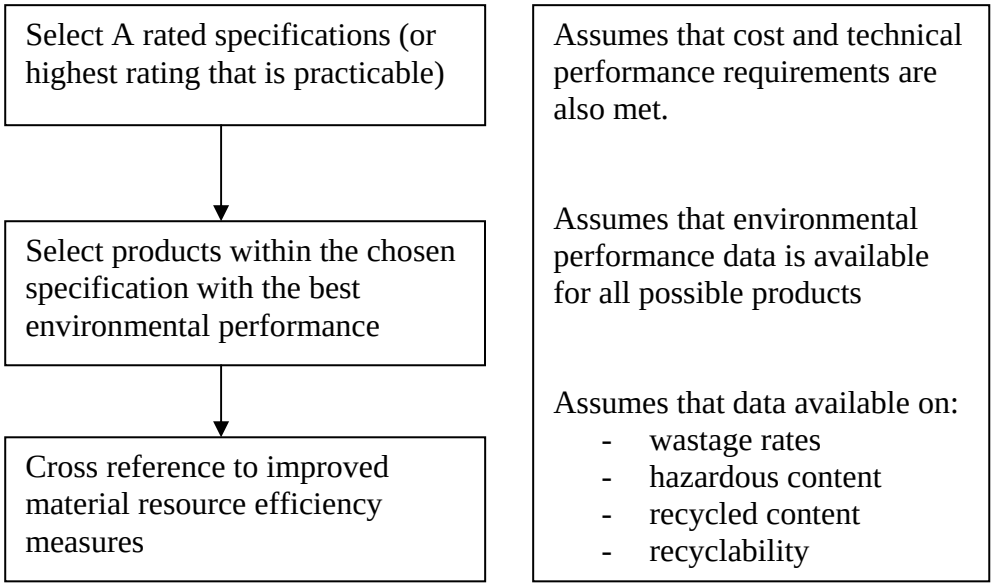
Weighting of LCA data is the only way to derive a single metric, e.g. carbon equivalence or ecopoints. It is also an inherently subjective process. Climate change and the need to reduce fossil fuel consumption has meant that related impacts attract a higher weighting than any other type of impact. In the absence of other drivers this would not be a problem, i.e. most of the focus would be on reducing energy with other issues only considered once this has been achieved. However, we are living in a world where multiple drivers operate including the need to:

- reduce waste to landfill
- reduce consumption of materials
- reduce contamination of the environment
- reduce whole life costs
- reduce local environmental/social impact

The current status of LCA does not reconcile all these needs sufficiently.

[1] Type III environmental declarations present quantified environmental information on the life cycle of a product (based on independently verified LCA data, LCI data or information modules in accordance with the ISO 14040 series) to enable comparisons between products fulfilling the same function.

Figure 1: Possible decision making approach for product selection



Better designed products and consumption

There is no simple answer in isolation of how the products will be specified, distributed, installed, maintained and removed/disposed of. Therefore, decisions made by all those in the supply chain should be considered when improving the design of certain products.

An integrated approach to waste reduction in the construction sector would achieve greater impacts than one reliant upon design decisions. For example:

Commitments	Purpose/ Links
Set baseline data for construction related waste	Start process of improvement
Measure performance consistently in terms of waste reduction, reuse, recycling etc per company, sector, process and product	Measure levels of improvement
Extended producer responsibility for all key construction products OR industry agreed voluntary commitments	Promote resource efficiency on a product basis, e.g. returnable packaging, ecodesign
Supply chain commitments in place for all government procured projects	Targets for waste reduction will only be met if the supply chain is committed to combined action
Relevant professional training/education to include modules on resource efficiency	Construction professionals educated to consider resource efficiency to be part of their future jobs e.g. designers

Strengthen the Code for Sustainable Homes to require significant waste reduction at levels 3 onwards	Sets out requirements to reduce waste as part of overall standard
Recommendations	
Develop consistent method of measuring carbon impacts relating to waste and resources	Links to reducing overall environmental impact of construction through better decision making
Develop consistent method of measuring whole life cost impacts relating to waste and resources	Links to reducing overall cost of resources and waste through better decision making
Encourage the reduction of waste in preference to recycling	Recycling has been promoted above reduction and reuse. It is important to redress the balance

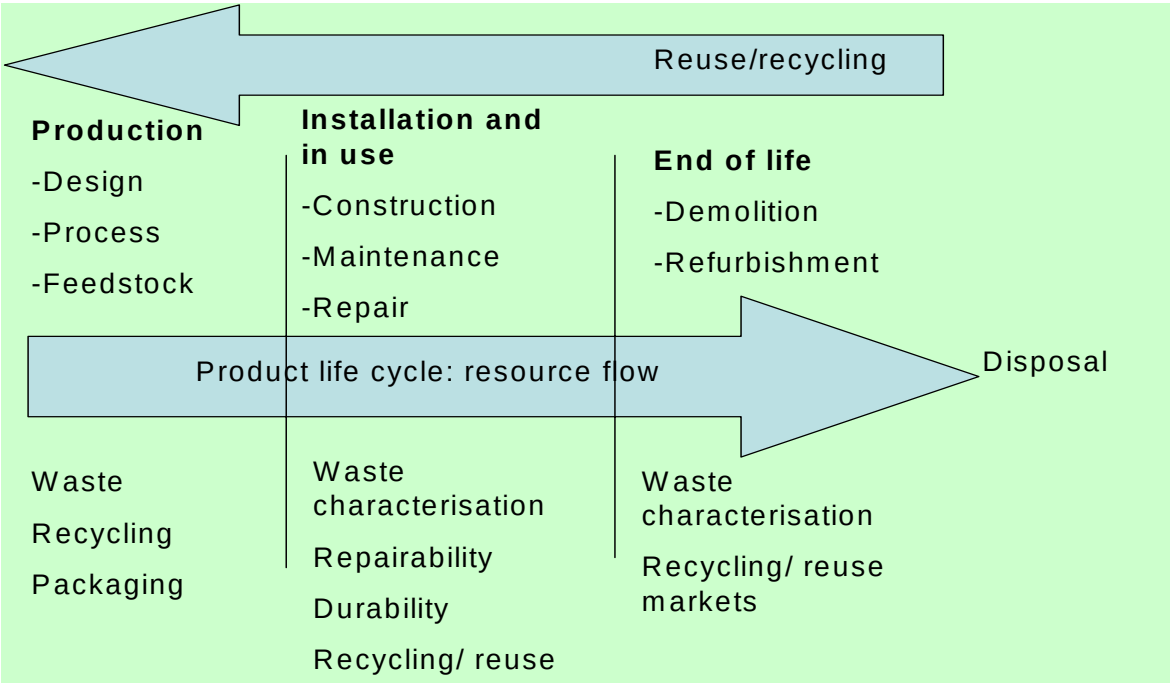
Business framework

The introduction of Site Waste Management Plans from April 2008 (to be confirmed) provides a good foundation upon which to encourage waste reduction throughout the supply chain. In the first few years it is likely that businesses will focus upon demonstrating compliance with the legislation and associated policies, such as the Code for Sustainable Homes. However, BRE is developing a Site Waste Management Planning tools with a carbon calculator module to drive the user much more in the direction of waste reduction. The logic in applying carbon calculation mainly derives from the reduction in embodied energy from using less materials. Carbon benefits from recycling are likely to be far less significant when compared to not producing the waste in the first place. Our tools will make this saving much more obvious, which along with the better cost savings should eventually promote waste reduction within a framework of overall sustainability i.e. avoiding the trap of focussing on a single sustainability issue.

Waste reduction in action

BRE believes that most construction waste can be avoided if the supply chain is set up to prevent it arising. This is the premise behind an industry & government funded project currently underway. This project – Be Aware – tracks products through their life cycle, collecting data on how much and what waste is produced along the way. The next stage is to model alternative scenarios in terms of improved resource efficiency and the overall life cycle impact resulting. Over the next few months, supply chain workshops will be carried out with certain sectors, including modern methods of construction, plastic/ composite construction products, and timber based construction products. At these workshops, the industry stakeholders will be presented with the data captured for each set of products and asked to identify opportunities and barriers to reducing waste at each stage of the product life cycle. The results of each workshop will be used to generate guidance for each sector group. The points of intervention and life cycle are summarised in the diagram below.

Fig 2: Product life cycle



Better information is needed to facilitate waste reduction. There is little point presenting the construction sector with generic targets to reduce waste unless these are accompanied by more specific guidance and data on who is accountable for which aspect of the waste stream. Isolating this information is a pre-requisite to developing sector based voluntary agreements/ commitments to reduce waste, as illustrated in the Ashdown agreement. This agreement has been completed for the manufacturers of plasterboard and is still being developed for other aspects of the supply chain, such as design, installation and demolition. Once all the specific agreements are in place, it will be possible to bring them al together within a supply chain agreement to reduce waste and divert waste from landfill. Then it will be necessary to report progress against the overall and specific agreements.

BRE has been developing construction waste benchmarks for over 10 years. A Defra funded project is helping to create the first comprehensive set of national construction, refurbishment and demolition benchmarks. These are accessed from our smartwaste web site and will be added to by other datasets, along with those generated through BRE's web-base reporting software. The site waste management planning tool currently under development will add significant data to the benchmarking web site and support the construction industry in predicting the waste they will produce, set targets for waste reduction and measure progress towards those targets.

Government support role

Government funded support is extensive in this area, perhaps to the point of having 'too many cooks', some of which are attempting to attract the attention of the same businesses. This causes confusion in terms of where to access the best support. A thorough knowledge of the construction sector should be a pre-requisite to offering support in this area. Without this, the support agencies tend to over-simplify resource

efficiency, e.g. recycling/recycled content, and under estimate the interdependencies in the supply chain and overall building performance.

Product design and consumption patterns and behaviour

A great deal of debate revolves around the need to conserve resources compared with reducing operational impacts of buildings. A recent report suggested that carbon emissions from homes could only be reduced to levels required for government targets if levels of demolition were significantly increased, i.e. knock down poorly performing homes and replace with new energy efficient ones.

One major concern with this recommendation would be the massive increase in demolition waste. Demolition waste may form the bulk of the 100 million tonnes per year produced from construction related waste (no-one knows the actual breakdown of composition in terms of construction, demolition and refurbishment waste). If demolition rates increase, so does the amount of waste produced. Currently, around 90% of demolition waste is recycled; these high recycling levels cannot be sustained should waste produced increase and markets shrink. Markets may decline due to the move from more traditional forms of construction to those more likely to be lighter weight and off site fabricated. These modern methods of construction offer savings in terms of time and skills; the case has yet to be proven for reduced waste production over the life cycle.

The alternative to increasing demolition is to improve the environmental performance of existing homes so that the materials used to build them are kept in the building stock. Realisation that it is absolutely essential to improve the existing building stock's operational performance is increasing within government, industry and building owners. BRE is offering support to all these stakeholders through its work on refurbishment case studies (BRE Stable Block), decision making tools (T-Zero) and certification of domestic energy assessors, micro generation products and installers. With all the increase in refurbishment activity will be an increase in waste. The T-Zero project is gathering data on a whole range of environmental issues, including the amount and type of waste associated with refurbishment. Pre- refurbishment audits can identify products and materials that can be retained whilst minimising waste produced from the installation of new products.