

Annex 5 – Consultation process and responses of participants

There have been four major opportunities for industry and other stakeholders to input to the development of the CRW roadmap. Responses from the events are summarised in this Annex, as follows:

- A5.1 National Platform Support Group 26 July 2006
- A5.2 Written consultation from September to November 2006 on draft roadmap
- A5.3 Big Ideas workshop 27 November 2006 (target-related comments; see also Annex 6)
- A5.4 Workshop “Construction waste – strategic approach to materials and waste”, 17 January 2007

The information presented in this Annex is based on research completed before August 2007. Some of this information may, therefore, have been superseded.

For definitions of terms and abbreviations used in this Annex, please see the main CRW roadmap document.

A5.1. National Platform Group 26 July 2006

Notes¹ from the National Platform Group meeting of 26 July 2006.

What will the construction industry look like in 20 years?

Separate floor plate from cladding and fit out (3 separate industries). Floor plate 'forever' – 300 year life span Then gets clad – 50 year life span Then fitted out – 10 year life span. Cladding and fitting out – machine manufactured	Design for shorter life (or design buildings with adaptability in mind, so when current use changes, the building does not need to be replaced)
Like it is now	Cradle to grave responsibility
Rents reflect utility of space	Performance cost
Refurbishment on draw down of services basis	Owned by overseas companies, e.g. China
Costs down through technology	Recycling with added value
More off-site	75% built off site
Domestic 20 years – 30% by volume is pre-assembled	Offsite means lean production (13 tonnes delivered and not used)
Assembly line driven	Zero waste/energy/accident
Schools that aid learning	Hospitals that work
New ways of funding big and fast	Built in intelligence and monitoring
Private funding dominates	Minimally intrusive/disruptive retro-fit
Responsive standards (quicker amendments to enable actions)	Routine use of more system engineering (right first time)
More whole life costing	Whole life planning
Technology driven intelligence	Energy efficiency – Using less energy
Sustainability will be the driver. It will be quantified to agreed standards	More industry consolidation – fewer major players
Industry consolidation – fewer players	Less new build – more refurbishment
New build will be: easily repairable (long term), flexible/adaptable, minimise energy in use	Existing stock will be upgraded – climate change – energy consumption
Use of BIM and 'Avanti'-like(?) interpretable working to build or retro-fit 'right first time', avoiding conflicting remedial re-work	Machine made, flat pack fully complete, pre-wired pre-plumbed, super rigid buildings bolt together, with zero waste to site

¹ Comments shown were gathered by asking participants to write answers on moveable sticky notes, then groups were asked to prioritise the comments.

Evidence/performance measurement driven	Safe
Service delivery approach	Fully integrated working – reducing waste – improved efficiency
Performance certified buildings (tested and compliant)	Cassette facades (offsite tested)
Flexible space, clear span	No U-PVC
Buildings will not be fashion statement (this leads to obsolescence)	Commercial – cradle to grave responsibility for installed plant (ref WEEE)
Commercial 20 years – most buildings are all-electric (no gas)	Domestic 20 years – high performance envelope the norm – materials largely as now

What are the implications for resource efficiency and construction activity?

Planning is the driving issue	Far greater re-use and recovery
Design out waste from beginning	Private ownership; producer responsibility
More of same	Whole life planning
Service delivery	Adaptable
More off-site approach > new materials build on resource	Transportation cost issues increase or decrease? OSM claim 30% less transportation costs
Zero or low maintenance	PFI
90% of buildings will be pre-2026 > maintenance	Competitiveness
Modular – full component content label > 'What's in it' labelling	Local fabrication, less modular, reduce transport waste
National agenda to do with volume	Local centres of manufacture/fabrication – close to site, assemble locally, local skills/employment, less transport
Dual water supply	Major standardisation
Death of crafts	Intelligent way of dealing with refurbishment
Move to BOOT (Build-Own-Operate-Transfer) will > increase LCC/A importance > create need. For 'new' accountancy that encourages longer time horizons	End of life: responsibility will > move to (new) fully recyclable materials > fully demountable construction > materials labelling
Re-use and recovery of material	Logistics dominated
Low or zero maintenance	Big scale equivalent of nanotechnology
Question will be resource effectiveness rather than efficiency	Detailed environmental impact knowledge about each product
More flatpack	Higher material image efficiency
Zero waste and energy technology	Standard interfaces; plug and play elements

Greater intelligence in building > energy use and air quality > all electric buildings in future (locally generated?)	More loose-fit > flexibility in how buildings are used through the week, i.e. moving walls variable lighting environments
Increased multi-functionality	Continuum (flow) production
Full component labelling (RFID?) > needs framework	Major standardisation programme or lock-in on supply
Multifunctional packaging	

What are the key things that need to be done?

Integration/single voice – not multiple bodies	Friendly and adaptive standards and intelligence > getting people signed up to it
Performance criteria/specification	Right planning
Education programme	Mechanism for understanding carbon footprint
Re-educate architects and designers	Building recycled content labelling
Proper analysis of benefits of offsite, refurbishment, environmental impacts	Whole life thinking – need to understand better Value model – not just costs
More robust demonstrators	Develop right commercial context
Incentives to use recycled material	RFID tagging for recycling and re-use
Develop means of upgrading buildings while maintaining architectural integrity, with optimised resource efficiency	Mechanism for defraying risk to user for using new material – recycled/reused material
Funding for third-party certification of new materials/recycled products	Incentive to pay more to get materials – kick starting industry
Legislatively driven actions	Warranties final buildings

A5.2. Consultation responses to draft roadmap document

Many comments from the consultation on the draft roadmap related to data and scope. These have been incorporated wherever possible. It has not been possible to address all the comments, especially those involving significant issues that fall out of the scope of the roadmap (as indicated in the roadmap document).

The comments detailed in the table below are more generic in terms of future needs identified by consultees. The full report can be downloaded from www.bre.co.uk/wastestrategy.

Comment	Links to
A review should be undertaken to study the ways waste was dealt with historically when the use of more bio degradable materials was used.	Evidence need
All measurement should be as accurate as possible and kept as simple as possible.	Evidence need

“If building lifespans are reducing” – are they? If we are building houses that won’t last beyond fifty years a general question of sustainability arises.	Evidence need
Good idea to provide a transparent benchmark against which the complex interplay between logistics and end process technologies can properly be assessed for emergent new technologies in waste.	Evidence need
If one presumes that eventually the sector will be embraced within the EU ETS for CO ₂ emissions, such studies will assist companies in gaining a better understanding of the CO ₂ footprint and liabilities created by the various technology options. This will assume significant economic implications in years to come.	Evidence need
How will you monitor/measure performance against targets?	Evidence need
What about introducing something comparable with CDM but for waste?	Policy action
The market place for waste is already highly developed – look at architectural salvage, London Stock Bricks and lead, for example. Trying to manipulate this market place is high risk.	Policy action
Link waste issues through the Energy Performance of Buildings Directive.	Policy action
Consumer demand is not enough of a driver for change; increased legislation across the supply chain is required to bring about significant change.	Policy action
We need to target the next generation of builders and make sure they come on to site asking where to recycle and why the offcuts are not being used, rather than waiting to be told.	Policy/ Supply chain action
Fragmented nature of the industry is one of the fundamental reasons waste occurs.	Supply chain action
The way to reduce waste is not to demolish in the first place. Steps need to be taken to ensure that traditional building skills are not lost in the drive towards off site manufacturing to reduce waste.	Supply chain action
Encourage the use of repair rather than replace in construction.	Supply chain action
If a quota of recycled content is required in each project this would help to stimulate the market.	Supply chain action
If traditional construction methods are likely to be replaced by standardised and factory produced buildings and elements as indicated in this strategy, any targets set for recycling and reuse would need to be able to adapt to this potential change in building methods.	Supply chain action
Adaptable buildings – opportunity for this but will be incur higher capital costs.	Supply chain action
Review process equipment to establish a link and network for recycling plasterboard products. Research has indicated that a process with an efficiency of 85% recovery from waste could be achieved.	Support need
The main problem which plagues construction companies that want to recycle or use recycled materials is the lack of availability.	Support need

A5.3. Big Ideas workshop 27th November 2006 (target-related comments; see also Annex 6)

The following information was presented to the workshop:

Defra is considering a set of targets for construction waste, and would welcome any feedback.

1. *Defra will be publishing its review of the England Waste Strategy Spring 2007. Different sectors will be given a focus in the annexes; one annex will be about construction. Defra are mindful to include the following strategic targets in this annex:*

TARGET 1: Construction clients to include contractual requirements for measurement and improvement of materials resource efficiency in one-half of construction projects in England over £1 million in value by 2009

TARGET 2: Construction industry to halve the amount of construction, demolition and excavation wastes in England going to landfill by 2012 as a result of waste reduction, reuse and recycling

TARGET 3: Government to achieve waste-neutral construction in its major construction projects in England by 2012

2. *BRE will be recommending to Defra that, as well as these strategic targets, some specific targets should also be included. In particular BRE would like to see the following included:*

- *Focus on getting better data for construction waste, establish clear baseline, set targets in the future for waste reduction, reuse and recycling, e.g. compared to 2007 baseline:*
 - *Reduce construction and refurbishment waste by 50% by 2015*
 - *Double the rate of reuse, recycling and recovery of construction and refurbishment waste by 2015*
 - *Increase the reuse of demolition waste/ maintain overall recovery rates*
 - *Reduce CD&E hazardous waste by 80% by 2015*
 - *Reduce illegal disposal of construction waste to zero by 2015.*

The following questions were put to participants:

- Should the Defra annexe include only the strategic targets?
- Should it include only the specific targets, i.e. BRE's?
- Or a combination of both.

Furthermore:

- Do you think these are the right targets anyway, or do you think they should be something different?

Five main points came out in the discussion

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| <p>1. Tonnage might not be the most appropriate metric – volume gives a better indication of the actual amount wasted and does not discriminate against/for heavy materials. Example is plastics vs. concrete – are they considered equivalent on a tonne-for-tonne basis with respect to resource and waste impact?</p> |
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| 2. Construction industry/sector is very diverse and fragmented. Therefore any targets should be allocated on a more specific basis, i.e. who is being asked to do what. The first target is thus good in that it highlights clients as doing something. This could also be reflected in the development of voluntary agreements, e.g. the PVC recovinyl scheme and the ongoing plasterboard agreement. |
| 3. Before challenging targets are set for recycling there is a key requirement to put the necessary recycling collection, handling and management infrastructure in place. |
| 4. Why have a waste strategy? Shouldn't it be a 'resources and waste strategy' if part of the objective is to design-out waste and increase recycled content of products? (Note: Seems to be some overlap between what might be expected to be the remit of the sustainable products area and the waste area.) In construction, materials/resources and waste are closely linked. |
| 5. This brings us on to the final point that met strong agreement amongst the group – waste and resource use should be set firmly within the context of reducing whole life cycle costs. There is a massive skew towards recycling/recycled content in terms of government support and strategy. This does not make sense and there is a real risk that whole life cycle costs will increase if these targets are pursued without being set within life cycle decision making/data/support/tools. |

A5.4. Workshop :Construction waste – strategic approach to materials and waste”, 17th January 2007

The agenda for the workshop included:

- Overview of project – “Strategic Approach to Construction Waste”
- Progress reporting of evidence gap projects
- Site Waste Management Plans and waste prevention
- Construction products data
- Reclamation industry survey
- Whole life costing and resource efficiency
- Future legislation and forward look.

The day included a break-out session where participants were asked to list actions/projects that should be undertaken in support of/to implement the Construction Resources and Waste roadmap.

The ideas this generated were then grouped into key themes, prioritised and key stakeholders identified.

Results of break out session

All workshop attendees were asked to submit three actions that should be taken. The results are summarised in the table below and were grouped into themes – some actions are relevant to one or more themes but are only listed in one category.

Theme	Recommended activities
Legislation/policy	<ol style="list-style-type: none"> 1. Identify what aspects of waste management legislation cause greatest confusion or limits to recycling (Stakeholders: industry, Govt, EA) 2. Promote reclamation and reuse above recycling in terms of policy, legislation, funding, indicators and research 3. More joined-up business support to the construction sector from the BREW delivery partners

	<ol style="list-style-type: none"> 4. BREW delivery partners to present a unified, co-ordinated and collaborative approach that goes in the same direction 5. Clear linkages between new/developing government strategies and initiatives (both voluntary and mandatory) 6. Better understanding of Decent Homes refurbishment programme implications (Stakeholders: HC, RSLs, Govt) 7. Develop WRAP/EA quality protocol for other materials, e.g. incinerator bottom ash
Targets	<ol style="list-style-type: none"> 1. Clear commitments for action by those who can effect change 2. Long-term aim for zero waste to landfill from site (stakeholders: product manufacturers, distributors, contractors, clients, Govt) 3. Establish some shorter-term targets for industry to motivate change 4. Agree key waste targets to reduce waste and costs, increase reuse and recycling (Stakeholders: Govt, EA, BRE, WRAP, industry bodies)
Standards and guidance	<ol style="list-style-type: none"> 1. Guidance on the recyclability and reusability of building products and components throughout their life cycle 2. Produce consumer sheets on key reclaimed materials (downloadable from web) 3. Identify how to take actions forward including existing support available, linking this up and accessible R&D funds 4. Produce shopping list of reusable products/materials – what is best to use in terms of future resource efficiency 5. Promote/gain agreement within the industry on recycled content of construction products, including product labelling/information 6. Produce targeted advice and guidance for specific industry sectors with the relevant trade association
Supply chain improvement	<ol style="list-style-type: none"> 1. Industry/sector review of more sustainable packaging for construction products, including take back schemes. (Stakeholders: producers, merchants, EA) 2. Embed resource efficiency into contracts – need to know how and what through best practice guides 3. Need supply chain collaboration and commitment (Stakeholders: All) 4. Strategic approach to materials and sub-contract procurement (Stakeholders: clients, designers, contractors) 5. Social housing contracts: Consider different systems for designing out waste and the effect on costs (Stakeholders: HAs, contractors, suppliers, recycling contractors) 6. Major housing sites – can waste be designed out and can management systems be cost effective/beneficial? (Stakeholders: housebuilders and their suppliers, recycling contractors)
Training and awareness	<ol style="list-style-type: none"> 1. Awareness raising and training on resource efficiency issues facing construction sector 2. Establish and disseminate examples of good waste practice showing cost benefits and how achieved (Stakeholders: BRE, WRAP, CPA, other industry bodies, contractors) 3. More media attention 4. Local/regional exemplar projects demonstrating best practice 5. Develop promulgation routes using trade association websites and the press but linked to a central website
Tools/indicators	<ol style="list-style-type: none"> 1. Embodied energy of reclaimed products vs. recycled. Charts and online calculators 2. Develop carbon calculator for embodied energy of waste (Stakeholders: manufacturers, contractors) 3. Develop a waste and carbon calculator

	<ol style="list-style-type: none"> 4. Gaining clarity on indicators for recycling, e.g. BRE vs. WRAP, and moving towards a simple funded scheme for specifiers and manufacturers 5. Green building asset valuation, i.e. client will benefit over asset life 6. Assessing recyclability/recycled content of products regarding other whole life environmental issues 7. Develop methodology to produce best whole life costing system which when used by clients/specifiers results in truly sustainable product selection (Stakeholders: BRE, WRAP, trade bodies) 8. Develop methodology to assess recyclability of materials, i.e. if clients/specifiers use such materials then 100% of site waste could be recycled at end of life (Stakeholders: trade bodies, BRE, WRAP)
Data/knowledge	<ol style="list-style-type: none"> 1. Survey of non-aggregate C&D waste in terms of amount, composition, what happens to it (Stakeholders: Govt, BRE, EA, WRAP, industry) 2. Genuine data relating to cost of waste during construction through skip monitoring, with results made publicly available 3. Baseline data using strategic approach against agreed methodology and framework (Stakeholders: manufacturers, suppliers and contractors) 4. True wastage rates per product and sector to link to voluntary agreements 5. Getting some real numbers for wastage rates in precast and ready-mixed concrete products (rather than continuing to use Laxton's approach which is based upon a QS over-specification rate) 6. Sort out data for disposal of non-inert C&D waste rather than just arisings, i.e. how much is going to landfill? (Stakeholders: Defra, BREW partners, ESA, Construction bodies – MCG, NSCC) 7. Improvement and scrutiny of AMA data on construction products 8. Fill evidence gaps but continue to move in the right direction 9. Identify waste materials where recycling is especially low or not possible and main reasons (Stakeholders: site contractors, BRE, waste collection/recycling contractors) 10. Make trade associations responsible for collection and authentication of production and waste data – we can then share the data (Stakeholders: relevant trade body, e.g. BPF) 11. Refurbishment waste data – shop fit out 12. Destination of waste, i.e. % landfilled, reclaimed, recycled per sector 13. Waste from demolition data 14. Questionnaire/research into operational waste from running a building (portfolio owners) to cover cost, type, quantity related to age 15. Understanding trends and patterns of demolition waste, i.e. future activities (stakeholders: demolition contractors, trade bodies) 16. Investigate the recycling opportunities available to site contractors depending on materials and location (Stakeholders: local councils, BRE, waste collection/recycling contractors, site contractors) 17. Allocation of waste across the supply chain, i.e. who is causing what proportion of waste 18. Better understanding of the drivers e.g. forcing reclaim actions to change to recycling actions 19. Investigate main reclaimed materials used in mainstream construction – who specified, who was liable, were there any standards of supply