Waste Reduction – BUILDING PRODUCTS

This guide is part of the REBRI series developed to encourage and assist everyone involved in the construction and demolition (C&D) industry to reduce waste to landfill and cleanfill. It provides good practice guidance to reduce waste through product design, distribution and use and the recycling and reuse of products and their packaging. It is relevant to:

- product manufacturers
- distributors and suppliers
- retailers and wholesalers.

The aims of this guide are to:

- assist those involved in the supply of products to the construction industry to consider how and why waste is created on site as a result of their products and services
- demonstrate design, manufacture, retail and supply options to reduce C&D waste and end-of-life recycling and reuse options
- foster environmental awareness in the building products industry.

This guide covers:

- product design
- packaging
- wholesale and retail
- delivery
- product information and support
- internal procedures
- how you know whether a product or packaging is reusable or recyclable
- links, resources and information.

The waste issue

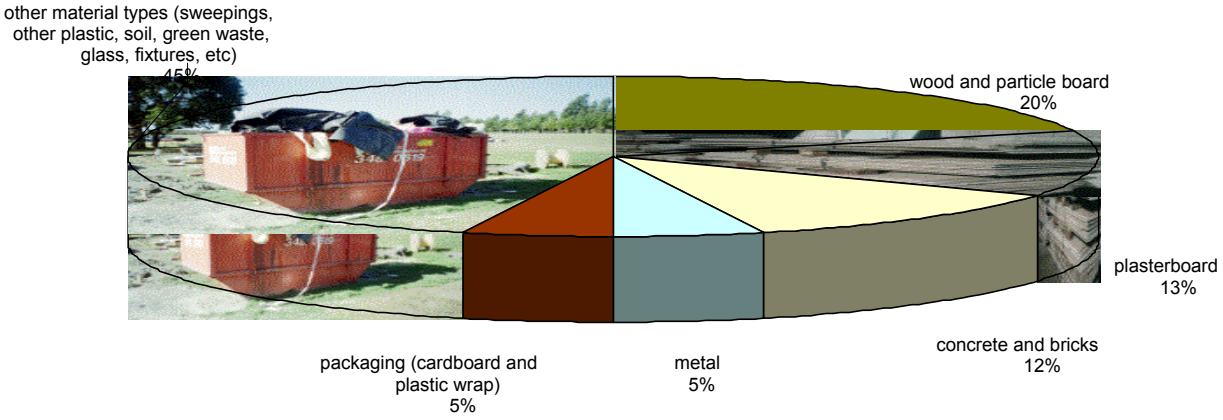
Waste is generated on building sites during each phase of the building life cycle. Evidence suggests that C&D waste may represent up to 50% of all waste to landfills in New Zealand and the majority of waste to cleanfills or C&D dumps. That means that up to 1.7 million tonnes of C&D waste is sent to landfills every year and similar amounts to cleanfills.

That's a lot of waste to bury in the ground. Not only is this a waste of good resources, it is also filling up valuable landfill and cleanfill space and contributing to serious environmental problems such as air and water pollution. Increased consumer spending and the relatively low cost of waste disposal means that, unless we take action now, it is a problem that is likely to get bigger.

Products end up as waste during construction through off-cuts, mistakes, temporary works, poor workmanship, inefficient installation or use or because of damage. During demolition, products become waste when they cannot be salvaged efficiently or cannot be recycled or reused.

Product design and materials selection, manufacturing specifications and methods, the way products are packaged and delivered to site and the instructions on product use and installation contribute to the waste on construction and demolition sites.

Typical construction waste skip, measured by weight



Source: Christchurch City Council Target Zero Construction Waste Reduction Project.

11 top tips for waste reduction from building products

Product design and materials selection, manufacturing specifications and methods, packaging and delivery and the instructions on product use and installation contribute to the waste on building sites.

1. Consider providing special manufacturing runs for clients to their specification or design your product range to suit standard sizes of other building products (to reduce the need for resizing on site).

2. Consider incorporating recycled materials in the product. Recycle waste product back into new product or use materials from other waste streams.

3. Consider how to achieve seasonal trends and design innovation while reducing the waste created during building and demolition. Consider product durability or ways to update part of the product rather than the entire product during renovations (i.e. by changing veneers or components rather than replacing the entire product).

4. Limit maintenance requirements – this may reduce the use (and wastage) of other materials in the installation and use of your product.

5. Make your products easy to dismantle for reuse and recycling by using mechanical fixing instead of adhesives, by not blending too many materials together or by minimising finishing requirements while still maintaining quality.

6. Offer a take-back service for surplus materials, off-cuts, scrap and packaging.

7. Rationalise and reduce packaging to use minimal types and amounts of materials (e.g. through light-weighting).

8. Provide packaging that is reusable or recyclable.

9. Provide information with the product describing handling, storage and recycling methods for the product (including off-cuts and damaged goods) and packaging.

10. Make waste reduction a key part of training, after-sales service and product literature for tradespeople. Include how to recycle and reuse the product.

11. Provide a just-in-time delivery service to reduce the chance of damaging materials during storage.

The three Rs: reduce, reuse, recycle

Applying the three Rs of waste minimisation to your practices will lower the volume of waste going to landfill, reduce demand for new materials and conserve precious materials for use by future generations. The three Rs work in a hierarchy:

1. Reduce

Preventing waste from being created in the first place is the best way to reduce waste. The way products are designed, used or installed can prevent wastage in adhesives, packaging, off-cuts, extra finishes or cleaning products.

2. Reuse

Reusing materials as much as possible is the next best way to reduce waste. For building products, this could mean having reusable packaging or creating products that can be reinstalled or used for another purpose after their original use.

3. Recycle

Resources that have reached the end of their useful life and off-cuts of materials should be recycled where possible. Where products cannot be reused, the components or materials should be designed to be recycled at the end of their original use. Of course, recycling materials is not enough. You need to help create a market for recycled resources by designing products or promoting the use of products with high recycled content.

How your business benefits

Reducing waste is not just good for the environment. Benefits for your business include:

- being part of the preferred supply chain for projects that specify REBRI waste reduction procedures
- innovation in product design and manufacture, which can help to attract and retain employees, enhance the company image and encourage repeat business
- developing new products and new uses or installation methods, leading to more interactions between you and clients.
- market advantage for products with environmental considerations.

Product design

To reduce waste at the building site and during the life of the building, good product design should:

- reduce off-cut waste during installation by conforming to standard modular construction dimensions
- minimise product use associated with installation and finishing (paints, glues and so on)
- increase durability to reduce the need for maintenance and replacement
- be fit for purpose to reduce the need for maintenance and replacement
- allow the materials to be easily recycled to prevent disposal to landfill at the end of life – recycling is easier if products are made from a single recyclable material or materials that can be separated for recycling
- withstand trends and fashion that lead to obsolescence, for example, products designed to enable colours to be changed easily may reduce the frequency of replacement
- ensure products are easy to clean, straightforward to maintain and simple to use so that they will last longer
- recycle waste materials into the manufacturing process to ‘close the loop’
- allow installation in a way that the building can be easily dismantled and materials reused, for example, by using fixing mechanisms that can be reversed without causing damage (screws, clips, bolts and gaskets in preference to rivets, mastics, adhesives and tapes).

Consider making some of the following changes to your product range to reduce the need for cutting or altering products on site and to reduce the amount of packaging waste:

- Standardise (and possibly rationalise) your product range. Dimensional coordination of components between manufacturers and across industry can assist in waste reduction.
- Provide 'made to order' sizes or product types.

Becoming more involved in the building design, construction and demolition process will help you to obtain a better understanding of customer needs.

Packaging

Packaging waste is a growing issue on building sites. Waste audits show packaging can be at least 5% by weight (and considerably more by volume) of any waste skip and can be a nuisance to manage when it is light and bulky (think plastic wrap or polystyrene). Primary packaging (directly around a product such as plastic tubes, buckets, drums and bags) and shipping or distribution packaging (plastic film wrap, cardboard, wooden crates and pallets) are both part of the problem.

Six different types of packaging materials are counted for one product – could this be reduced?

Waste can be reduced at all stages of the packaging lifecycle. The packaging lifecycle starts with designing packaging and choosing the raw materials to make it and ends with used packaging materials being recovered to close the loop or being disposed of to landfill. Packaging materials are not suitable for cleanfill or C&D dumps and often contaminate these loads.

The aim is to reduce packaging and provide packaging that can be easily recycled locally or can be reused many times before being recycled.

Issues to consider:

- Rationalise the types and amount of packaging materials (through light-weighting or packaging to order).
- Avoid packaging that is not essential. Stand back and look at the whole distribution chain and consider whether there are layers or types of packaging that can be removed or substituted or consider changing distribution methods (see

below). Ask questions: Is that plastic wrap essential for product protection or is it just a branding tool? How can we brand better while reducing packaging?

- Use recyclable packaging materials or, better still, use reusable packaging. Examples include:
  - plastic numbers 1, 2 or 4 (check www.plastics.org.nz/environmental/recycling/whatcanberecycled to find out what types of plastics can be recycled in your area)
  - paper or cardboard stuffing rather than polystyrene
  - reusable strapping instead of plastic shrink wrap or disposable strapping
  - sturdy returnable pallets instead of flimsy throw-away pallets – have a system to retrieve them for reuse (see delivery options below).
- Provide clear information on reuse and recycling options (preferably directly on the packaging):

  - Use the RONZ symbols (downloadable from www.wasteminz.org.nz/pubs/ronz-symbols) – these are well recognised throughout New Zealand and help the builder and the recycling operator.
  - On plastic packaging containers, have a plastic resin identification code clearly visible on each container – a list of the plastic identification codes, developed by Plastics New Zealand, is available at www.plastics.org.nz/environmental/plasticsidentificationcode.
  - Providing this information on packaging raises the awareness of recycling and can be a positive message for the manufacturer or supplier.
- Ensure packaging is not impregnated, labelled, coated or otherwise treated in a manner that would prevent recycling (check with the recycling companies), for example, plastic wrap cannot be recycled if it has stickers on it.
- Check with recycling companies on the effect of components such as closures, labels, sleeves and carry handles may have on the recycling process – remove or change features to enable recycling.
- Use pre- or post-consumer recycled material in your packaging – this helps to close the loop on other material life cycles.
- Use a single material in packaging where possible to aid in separation for recycling, for example, avoid laminated cardboard or mixed plastic packaging.
- Audit the packaging process regularly to check staff are not being wasteful, for example, saving several metres of shrink wrap on every pallet will reduce waste at the building site.
- Consider alternative distribution methods to reduce packaging needs. Again, stand back and look at the whole distribution chain. Using reusable shipping containers may be better than using throw-away pallets and having to shrink-wrap products.
- Reuse your packaging (see Delivery below for details).

Wholesale and retail

Wholesale and retail outlets are the essential link between building sites and the manufacturers and importers and can influence packaging and delivery methods, product design and characteristics and be a conduit for product information.

Packaging

- Consider the way products are packaged from your outlet for delivery. Also consider whether your business is adding unnecessary layers or creating waste by repackaging.
- Talk to product manufacturers about reducing their packaging and include feedback from customers about the ease of recycling or reuse.
- Work with manufacturers on a packaging return system. These systems require coordination from everyone in the supply chain (see Delivery below for details).
- Offer to provide products in bulk to reduce packaging. If necessary, negotiate this on your customer's behalf with the product supplier.

Resene has established a take-back scheme for paints and containers from retail customers. One of their recommendations for other suppliers considering establishing a take-back scheme for packaging or products is to start with a trial for a fixed period and make this clear to everyone from the outset.

Promote waste reduction in the building industry

- Provide information on C&D waste reduction in your store. Put the REBRI Waste Reduction guides on your pamphlet display racks and include them in your quote packs.
- Host information evenings or breakfasts, use store displays and sales brochures and otherwise promote C&D waste reduction in your store.

Product range

- Consider stocking second-hand building materials and products made out of recycled building waste. This helps to close the C&D waste loop and does not need to be left to the demolition retailers. Some ideas include:
  - crushed concrete aggregate
  - waste wood chip landscaping mulch
  - second-hand native and hardwood timber lengths
  - second-hand fixtures and fittings (doors, handles, light fittings, windows etc.)
  - exterior cladding, insulation, engineered wood products (EWP) and wall linings manufactured with recycled content.
- Find out through the Zero Waste Buy It Back Guide www.zerowaste.co.nz/resources-education/buy-it-back-guide what types of recycled products are available to stock.

Product information

- Review in-house information packs on product use and building methods to include waste reduction tips (see Product information and support below). Use the REBRI Waste Reduction guides as a basis for your information. Other sources of information include waste reduction professionals and product suppliers (see Links, resources and information below).

Delivery

- Provide tailored delivery services to reduce waste while maintaining product quality and good service to building sites. Talk to your building customers about what they really need.
- Provide a just-in-time delivery service to site to reduce the chance of damage of materials that are on site for longer than necessary. Once materials are damaged, they become waste.
- Use reliable transporters who have policies and procedures that ensure that packaging and protection provided for goods while in transit is sufficient to reduce damage and therefore waste.
- Deliver products in sturdy, returnable packaging such as pallets or shipping containers to reduce the need for shrink wrap, plastic wrap and other throw-away materials.

- Compare bulk shipping with smaller consignments in terms of packaging and other wastage.
- Have a system to retrieve packaging for reuse. If considering a take-back option, you will need to:
  - investigate back hauling reusable packaging following the delivery of products to a site
  - factor in the likely time delay between delivery and use of the product (containers or pallets could sit on site for several weeks)
  - provide information on handling and storage of packaging to avoid damage
  - use robust materials
  - promote the take-back service you provide
  - consider a bond system – an example of this is reusable pallets where an extra delivery charge is refunded to the customer when the pallets are returned in good condition.
- Have a system to retrieve off-specification, damaged and over-supplied products for recycling and reuse (see Product information and support below).

Winstone Wallboards Limited have provided a take-back system for pallets for about 30 years. They charge customers for pallets and provide a refund when they are returned.

Product information and support

Product manufacturers and retailers can influence product choices and contribute to a reduction in on-site construction waste by considering aspects of sales support, product information and labelling.

Provide information on the products, packaging and sales literature

- The type and percentage of recycled content of products. Stating the recycled content will provide consumers with information to help them choose products that close the recycling loop.
- Reuse, recycling and/or disposal methods for the product or for off-cuts of materials.
- Handling, storage and installation procedures (including clear illustrations identifying both acceptable and non-acceptable practice).
- How products may be used and how they should be installed to minimise waste – this will help ensure that waste minimisation is considered during the design stage. Consider:

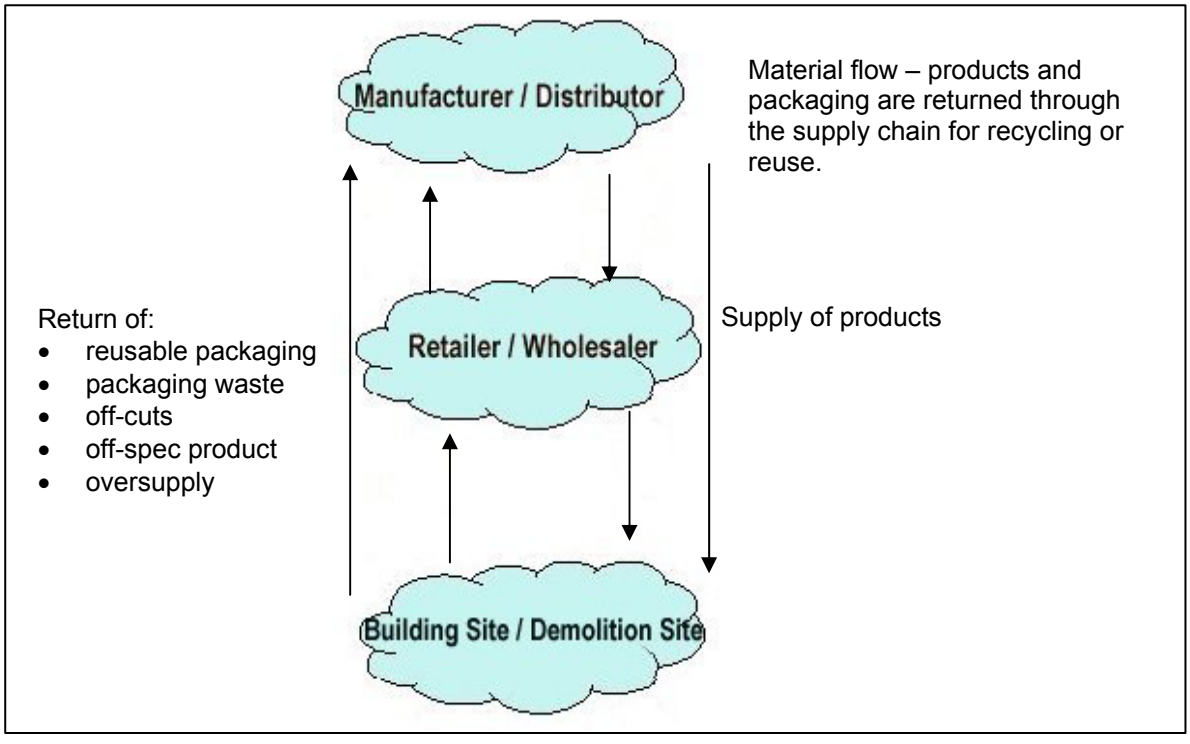
- information on sizes available – so designers can utilise materials in the most efficient manner possible to avoid off-cuts
- most efficient layouts to avoid off-cuts
- details on where it is appropriate to use the product and where it is not appropriate to use it (for example, wet versus dry areas) to ensure long product life and reduce damage to other parts of the building
- installation methods that allow easy dismantling/deconstruction (for example, using screws rather than glue).

Provide after-sales service

- Help ensure products specified by designers are fit for purpose, high quality and will perform well in the intended application.
- Help ensure products are installed to minimise waste during construction and use. Correct installation will ensure long product life and reduce waste as a result of off-cuts or mistakes.
- Support construction and demolition site recycling schemes by providing companies with recycling information, signage and so on.
- Have a service to take back off-specification product, over supply and other product and packaging waste. Provide a drop-off area and/or provide a pick-up service from building sites. Organise the recycling or reuse of product with a recycling operator or manufacturer. Set up a designated recycling storage area for returned wastes. Recycling operators can pick up in bulk from your depot.
- Promote the packaging return system for reusable packaging (see Delivery above).

Fisher & Paykel collect packaging and old appliances from retailers for recycling. Packaging is then graded for reuse or recycling. See www.fisherpaykel.com/nz/company/sustainability for further information.

After-sales service and support – closing the loop on products and packaging



Internal procedures

By integrating waste minimisation procedures into day-to-day business practice, product manufacturers and retailers can reduce waste generated as a result of their own business operations and by suppliers as well as on construction and demolition sites.

- Establish company-wide policies and procedures to reduce waste. Include measures to investigate and implement waste reduction and resource efficiency opportunities associated with both the product and packaging. Reviewing practices and processes will also be good for your bottom line. For further information on what you can do or who can help, contact your local council or visit the Ministry for Environment website www.mfe.govt.nz/issues/waste.
- Develop an environmental management system (EMS) such as Enviro-Mark® NZ or ISO14001. Increasing numbers of clients are requesting evidence of an EMS to show that manufacturing and retail processes are well managed and consider environmental issues, including waste reduction.
- Obtain an independently awarded eco-label, standard or award for the product (such as Environmental Choice) to demonstrate that you are taking steps to reduce the environmental impacts of your products and operation.
- Do business with recycling operators that follow the REBRI Resource Recovery Guidelines or are accredited to a nationally recognised environmental management programme such as ISO14001 or Enviro-Mark® NZ. This way, you can have greater assurance that they are working to good environmental standards and are 'doing what they say they do'.
- Reuse or recycle waste generated during manufacture or retail. Investigate on-site reuse and recycling opportunities first. For other reuse and recycling options, contact your local council to find out about waste exchange databases and recycling contacts. (See Links, resources and information below).
- Close the resource loop by incorporating recycled content in your product. This involves using post-consumer (returns of material from the distribution chain or from the building site) or pre-consumer (generated during the manufacturing process) waste as raw material. Find out through www.nothrow.co.nz what types of waste materials are available for substitution. The ultimate resource loop is to recycle surplus product, off-cuts and scrap from building sites back into the product.

How do you know whether a product or packaging is reusable or recyclable?

Do you know whether your product or packaging is recyclable or whether a product can be reused for another purpose?

- Find out what can be recycled in your area (www.branz.co.nz/REBRI_Recycling_Directory). The operators will tell you whether they can recycle your product or packaging or what modifications are required to enable them to do so (whether labels need to be removed or whether there's any pre-sorting required).
- Find out if there is a demand for your waste by visiting www.nothrow.co.nz. There is a nationwide network of waste exchanges where people advertise the supply of or demand for waste materials. These change often, so it pays to keep checking.

Polystyrene block off-cuts are separated from the waste stream and kept clean and dry. The waste is returned to the supplier for recycling.

Links, resources and information

- Packaging Council of New Zealand www.packaging.org.nz/index.php/sustainability
- ConsumerBuild – information about building and renovating homes in New Zealand www.consumerbuild.org.nz
- Enviro-Mark®NZ www.enviro-mark.co.nz
- New Zealand Waste Strategy www.mfe.govt.nz/publications/waste/waste-strategy
- Resource Efficiency in the Building and Related Industries (REBRI) www.rebri.org.nz
- Site Safe. www.sitesafe.org.nz
- Sustainable Business Network www.sustainable.org.nz
- The Waste Exchange www.nothrow.co.nz
- Waste Management Institute of New Zealand – WasteMINZ www.wasteminz.org.nz
- Yellow Pages www.yellowpages.co.nz
- Zero Waste Buy It Back Guide www.zerowaste.co.nz/resources-education/buy-it-back-guide

REBRI guidelines and tools

- Waste Reduction – Design and Planning
- Waste Reduction – Construction
- Waste Reduction – Demolition
- Waste Reduction – Building Products
- Waste Reduction – Home Renovation
- Easy Guide to Waste Reduction – Construction
- Easy Guide to Waste Reduction – Building Products
- Contract Specifications for Waste Management
- Waste Management Plan
- Waste Transfer Form

Glossary

- **C&D:** Construction and demolition – refers to the process of building or demolishing domestic or commercial buildings, excluding infrastructure.
- **Cleanfill:** Area for disposal of inert material that does not require the high containment standards of an engineered landfill. Also used to refer to such material. The material deposited in a cleanfill will typically be from construction and

demolition activities and will generally comprise soil, rock, concrete, bricks and similar inert material so does not include compostable materials, hazardous or toxic materials.

- **Construction and demolition (C&D) waste:** Solid waste typically including building materials, packaging, metal, plasterboard, timber, concrete and rubble resulting from construction, renovation and demolition of buildings.
- **Demolition:** Rapid destruction of a building with little removal of salvageable items.
- **Deconstruction:** The process of taking a building apart, storing and handling materials in a manner that achieves maximum salvage and recycling of materials and safe removal and disposal of hazardous materials.
- **Dismantling:** Taking a building or building components apart in a manner that achieves maximum salvage and recycling of materials
- **Engineered wood products (EWP):** Timber products that have been manufactured from wood pulp, fibre or veneer, for example, fibreboard or plywood.
- **Hazardous:** Explosive, corrosive, toxic or reactive.
- **HVAC:** Heating, ventilation and air-conditioning.
- **Landfill:** A site for the disposal of waste materials by burial. Historically, landfills have been the most common methods of organised waste disposal and remain so in many places around the world.
- **Non-hazardous:** Exhibiting none of the characteristics of hazardous substances.
- **PPE:** Personal protective equipment.
- **Renovation:** Changes made to a building including structural alterations, additions and redecorating.
- **Reuse:** Repeated use of a product in the same form but not necessarily for the same purpose.
- **Recycle:** Any process by which waste and recyclable materials are transformed or collected for the purpose of being transferred into new products.
- **Salvage:** Removal of structural and non-structural building materials from residential, industrial, commercial and institutional buildings deconstruction projects for the purpose of reuse or recycling.
- **Source separation:** The act of keeping different types of waste materials separate from other wastes from the moment they become waste,
- **Triple bottom line:** An assessment method that incorporates financial, environmental and social factors rather than just economic factors to make a decision.
- **Waste:** Any product or material resulting from the construction or demolition process that is surplus to or not included in the finished building

What is REBRI?

The REBRI waste reduction guidelines have been developed to encourage and assist everyone involved in the construction and demolition industry to reduce waste. REBRI stands for Resource Efficiency in the Building and Related Industries and started in 1995 as a collaborative effort between Auckland councils and BRANZ to undertake research and raise awareness of the issues of waste and the efficient use of resources in C&D projects. A consortium of councils, BRANZ, Recycling Operators of New Zealand and the Ministry for the Environment, with assistance from Winstone Wallboards Limited and industry representatives, extended the initiative in 2003 to undertake more research and develop national waste reduction guidelines.

Our thanks goes to the numerous individuals and organisations in the building and resource recovery industry, research organisations and in local and central government that have helped to develop these guides through participation at workshops, review of drafts and otherwise providing advice and time to the project.