

# Reusable packaging in construction

The benefits of reusable packaging options for construction product suppliers



Image shows branded reusable pallets used in the supply chain of Aggregate Industries

**Reusing packaging in the construction supply chain can cut cost, waste and carbon emissions compared with single trip packaging. Construction product suppliers can realise these benefits by working with the supply chain and using various types of reusable packaging.**

Packaging accounts for a significant proportion of waste in the construction sector: a study by Envirowise suggests that 34% of construction site waste is packaging (see Good Practice Guide GG606). Although reusable packaging is already used in the construction sector (e.g. returnable pallets), it is far more developed in other sectors. Examples are the retail sector where stackable trays and crates have largely replaced cardboard boxes, and manufacturing sectors such as automotive which make extensive use of totes and stillages.

This briefing note describes the benefits of reusable packaging to construction product suppliers, suggests reusable packaging types you can use and recommends actions you can take to increase packaging reuse. It presents findings from the WRAP report 'Reusable packaging options in construction' addressing the costs and benefits of expanding the use of reusable packaging in the construction supply chain.

## Options for reusable packaging

The study assessed ten reusable packaging options – five types of flat pallet and five other packaging options. It was found that all ten have the potential to deliver cost, waste and carbon emissions savings compared with single trip packaging. These are summarised below, with greater detail shown for the three reusable packaging options that performed best in our assessment.

- **Flat pallets.** A range of types of flat pallet can be reused and can replace the low grade single trip pallet, from multitrip unbranded "white" pallets, via manufacturer-branded pallets to high quality rental (e.g. CHEP, IPPL, LPR) and open-pool trade-marked (e.g. EPAL) pallets, and, at the top end, plastic pallets. The analysis shows that the highest quality wooden

## Key facts

- 34% of construction site waste by volume is packaging.
- 60% of pallets on construction sites are disposed of as waste – in either the waste or timber recycling skips.
- 40% of pallets handled on construction sites are unbranded "white" pallets, and 35% are manufacturer-branded types.
- Each of the ten reusable packaging types modelled in the study could deliver waste, carbon and cost savings as compared with single trip alternatives.
- If reusable packaging is back-hauled after use by the product supplier following delivery then the distance from supplier to user does not affect how beneficial it is to reuse the packaging.
- If reusable packaging is not back-hauled after use (but collected separately) then logistics distances and the number of trips the packaging makes before it becomes waste affect how beneficial it is.
- The minimum number of trips needed to give a carbon saving varied from 1.2 to 13 for the top three scenarios modelled.

pallets have the greatest potential for cutting cost and carbon emissions (although plastic pallets are better for waste saving) but the many different logistical, commercial and ownership options affect the number of trips that may be achieved in practice.

- **Box pallets.** High quality plastic folding box pallets have been used for closed loop supply of fragile fixtures and fittings such as lighting, where they offer a high degree of product protection. They can reduce the need for disposable packaging such as cardboard, plastic film and single trip wooden pallets, thereby saving on waste and carbon emissions. There can also be cost benefits but these are not as significant as the waste and carbon savings unless reduced product damage is taken into account.
- **Bulk bags.** Returnable bulk bags (or flexible IBCs) fitted with a bottom valve are suited to quantities of free flowing materials (e.g. sand and aggregates) too small for bulk delivery, and can replace palletised disposable paper / plastic sacks or single trip bulk bags. They are best suited to closed loop or repeat deliveries, or if the contents are emptied on delivery for immediate back-hauling. They were formerly used in the construction sector but have now been replaced mainly by single trip bulk bags.
- **Steel stillages.** Specialist robust steel A-frame stillages designed for carrying plate glass in the near vertical position can replace single trip pallets of non-standard sizes and associated protective disposable packaging. The use of such stillages could be expanded to other products such as dense cladding, heavy panels and frames, etc.
- **Cable drums.** Medium diameter (e.g. 600mm) returnable wooden drums can replace smaller disposable cardboard and plastic reels. Although they are less suited to small users, an additional benefit is that the greater continuous length of cable means reduced losses from off-cuts / tails. Their use could be expanded to products such as flexible pipe, pipe insulation and trunking.
- **Plastic crates.** Small folding / nesting plastic crates (e.g. 400x600mm footprint), as used in the retail sector, are best suited to closed loop distribution systems, such as between product suppliers and merchants / smaller retailers. Suitable for order-picking small quantities of mixed and loose products such as fixtures, fittings,

materials, tools and decorations, they can reduce the need for primary cardboard and plastic film packaging.

### Benefits of reusable packaging

- Cost saving: the total costs to you and your customers can be reduced even if waste such as wood is being collected free for recycling from sites.
- Carbon emissions from producing, transporting and disposing of the packaging (even if waste packaging is 100% recycled) are reduced.
- Waste saving: the total amount of waste arising is reduced, although the environmental impact of this is less if it is being recycled rather than going to landfill.
- Often greater product protection, reducing losses from product damage.
- Improved health and safety in product handling and on sites. For example low quality pallets can break in use.

### Risks with reusable packaging

- To realise waste, carbon and cost savings, you need to achieve a minimum number of return cycles – from just one to over ten for high grade packaging if not back-hauling.
- Depending on specifics, you could need improved planning / more admin / more storage space to manage returnable packaging.
- Standardising packaging such as pallets could mean they are not the ideal size for your products.

### Results from modelling three key opportunities

The study modelled an assumed typical use scenario, as compared with single trip packaging, to calculate performance measures related to waste, carbon and cost for the three reusable packaging options with greatest potential (trade-marked EPAL-type pallets, plastic folding box pallets and returnable bulk bags). These are discussed below. Two of the measures are:

- % total emissions savings, and
- the break-even number of trips for emissions savings, i.e. the minimum number of trips that the reusable packaging has to achieve (including the initial trip) to give a reduction in CO<sub>2</sub>equivalent (CO<sub>2e</sub>) emissions.

These results, showing the cases where the reusable packaging is back-hauled from user to supplier on the supplier's delivery vehicle and where it is collected separately for return, are shown in Tables 1 and 2. 100% recycling of waste is assumed.

**Table 1:** % CO<sub>2e</sub> total emissions savings compared with single trip packaging

	With back-hauling	With separate collection and return
Trade-marked (EPAL-type) pallets	81	38
Plastic folding box pallets	50	15
Reusable bulk bags	85	75

**Standard trade-marked pallets**

The use of high quality trade-marked pallets such as the EPAL EUR pallet can yield cost, waste and emissions savings provided at least 2-3 trips are achieved. As these pallets are capable of more than 10 trips, then achieving 2-3 should be readily feasible. Back-hauling as always lowers the break-even number of trips and could be easier for EPAL pallets than for most other types as they are free exchange pallets and in common use. The modelling is based on a 1000x1200mm pallet, which is one of the standard EPAL specifications, although the vast majority of EPAL pallets currently in use in the UK are of the 800x1200mm footprint. The modelling suggests that emissions savings of 81% could be achieved with back-hauling and 38% with separate collection of the used pallets for return.

1. 800 x 1200 mm Pallet EUR



2. 1200 x 1000 mm Pallet EUR 2



EPAL EUR pallets: 800x1000 and 1200x1000 footprints (Reproduced with kind permission of the European Pallet Association e.V.)

**Table 2:** Break-even number of trips for emissions savings compared with single trip packaging

	With back-hauling	With separate collection and return
Trade-marked (EPAL-type) pallets	2.3	3.4
Plastic folding box pallets	10	15
Reusable bulk bags	1.2	1.2

**Plastic folding box pallets with lids**

The plastic folding box pallet modelled has been described in a separate WRAP case study (Material Logistics Planning, Barts Hospital, London, March 2010<sup>1</sup>). This box pallet is very good for delivering waste savings (with a break-even point of just 2 trips). To achieve carbon emissions savings, a minimum of 10-15 trips is required, and cost savings will be realised at nearly 20 trips. However these conclusions are sensitive to the mileages involved and if the distance from supplier to user is small these benefits would be higher. Also the cost saving does not take into account likely further benefits from reduced product damage. The modelling suggests that emissions savings of 50% could be achieved with back-hauling and 15% with separate collection of the used box pallets for return.



Plastic folding box pallets owned by Whitecroft Lighting at the London Construction Consolidation Centre (top) and collapsed empty pallets stacked for return to supplier (below) (From WRAP, Case Study: Material Logistics Planning, Barts Hospital. London, March 2010)

<sup>1</sup> [http://www.wrap.org.uk/construction/case\\_studies/barts\\_hospital.html](http://www.wrap.org.uk/construction/case_studies/barts_hospital.html)

### Reusable bulk bags

For reusable bulk bags the break-even number of trips for emissions and waste savings is just 1.2. This relates to the fact that the reusable bag is not much heavier than the single trip version and also that plastic has a high embodied energy, so the carbon benefits from reuse easily outweigh the transport emissions. The break-even point number of trips for cost savings, at 3.3, is higher than for emissions and waste because the reusable bag is more expensive than the single trip version assuming costs of £10 as compared with £3. The modelling suggests that emissions savings of 85% could be achieved with back-hauling and 75% with separate collection of the used bulk bags for return.



Reusable bulk bags (Reproduced with kind permission of Tim Hutchinson, RPS (Returnable Packaging Services) Ltd)

### Key actions for construction product suppliers

- Where possible eliminate or reduce the packaging you use to supply your products. Otherwise use good quality reused and / or reusable packaging.
- Back-haul packaging wherever possible, exchanging packaging that you supply with your products for equivalent packaging that the customer has waiting for collection. This could be combined with taking back unwanted product.
- Use standard trade-marked pallets, such as EPAL, if possible, as these are likely to be reused even if you cannot back-haul, and consider rental pallets such as CHEP if you can set up closed loops with your customers.
- If you have to use non-standard pallets, then brand them with your name, retain ownership and back-haul or work with other service providers to get them back for you to reuse.
- Phase out unbranded white pallets, even if these could be used more than once.
- Where you cannot back-haul packaging then obtain high quality used packaging from other sources to use to supply your products, e.g. by arrangement with logistics services or pallet dealers.
- Work with your clients, both merchants and construction contractors, to set up systems to ensure that the packaging is either returned to you for reuse or collected for reuse by others.
- Consider if there are ways to reduce the primary packaging you supply, such as cardboard and plastic film, through the use of secure box pallets, smaller stackable crates or other forms of reusable packaging such as drums, stillages and reusable bulk bags.
- Work with your supply chain and trade associations to set up collective systems whereby the sector agrees to use standard specifications of pallet.

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