

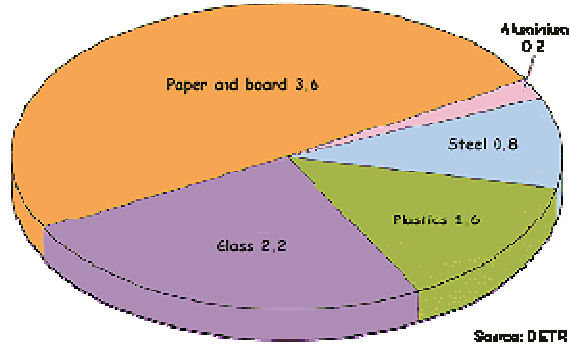
## Reduce, Reuse, Recover, And Recycle.

### Packaging Waste

This pie-chart shows the different materials used for packaging household, commercial and industrial goods in the United Kingdom in 1996.

Figures are in millions of tonnes.

It totals 8.4 million tonnes.



### PLASTICS

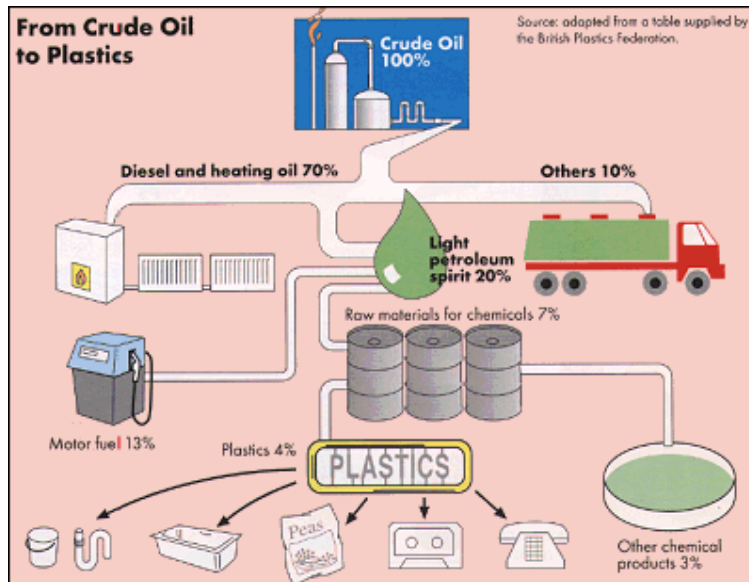
We use plastics in nearly everything we do, often without realising it. At home, clothes, carpets, baths and brushes are often made of plastics. So too are parts of fridges and freezers, vacuum cleaners and washing machines. Modern houses have plastic guttering and downpipes; the connections to water and gas mains are made of plastic piping. Electrical wiring is insulated with a plastic covering.

Heart valves and false teeth are made of plastics. So are records and video tapes, compact discs and camera film. More than a thousand plastic parts are built into the average European car.

#### Where do plastics come from?

The first plastic, celluloid, was made from coal and was used in the manufacture of billiard balls to avoid using ivory from elephants' tusks. Nowadays, only table tennis balls are made from celluloid.

Only 4% of the oil consumed in this country is used to make plastics and less than half of this is used to make plastics for packaging.



### Plastics for packaging

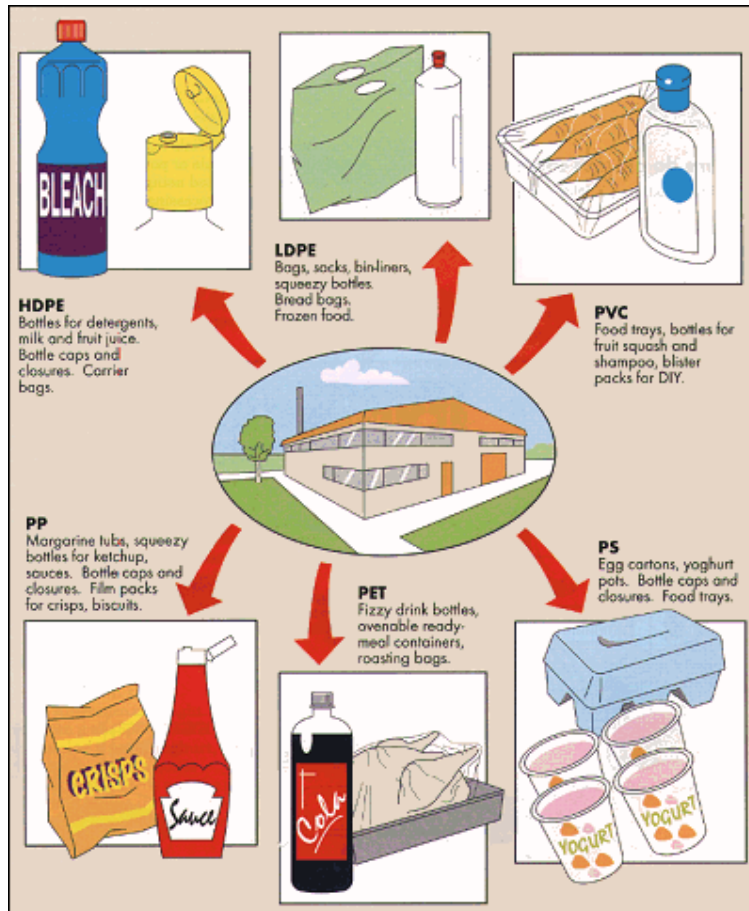
Packaging plastics are produced in chemical factories and have rather long names. The six major ones are:

- LDPE:** low density polyethylene
  - HDPE:** high density polyethylene
  - PP:** polypropylene
  - PVC:** polyvinylchloride
  - PSE:** polystyrene
  - PET:** polyester (polyethylene terephthalate)
- Luckily, they are usually known by their initials

The plastics raw materials (called polymers) usually come in granule or powder form. They are then converted using heat and pressure on special processing machinery to produce bottles, tubs, films, crates, etc.

Thirty years ago plastic bottles used to look cloudy and we could easily distinguish them from glass bottles. But scientists have now learnt how to stretch plastics in a special way to make them clearer and tougher. PET bottles for fizzy drinks are made in this way. Films too can be stretched (in a different way) and, for example, another plastic, nylon, is used for boil-in-bag foods such as frozen fish (their sharp bones might puncture other films). Stretched PET film is used as oven roasting bags for cooking chickens at oven temperatures up to 200°C.

*More information about processing plastics is available from The British Plastics Federation.*



## Paper and board

Paper and board are made from wood pulp (which comes from fibres found in trees) and waste paper. Board is manufactured in the same way as paper but it is thicker and heavier.

Worldwide, of the trees that are cut down each year, nearly three-quarters are removed to clear land for agriculture or used as fuel. The rest are used for commercial logging, producing timber for building and products like furniture and toys. The majority of paper is made from softwood trees which are grown and managed in forests specifically planted for this purpose.

Paper is mainly used for paper bags and labels and as one of the layers in lamination (layers of paper, foil or plastics bound together). Board is used in cartons and drums. Another product is corrugated board which is made from layers of paper and used where strong protection is needed, as in packing cases for electrical goods (television, radios, cookers, etc) and for chemicals, books, pharmaceuticals



and food packs. Because of the 'fluting' (the wavy layer in some cardboard boxes), it can absorb reasonable impact, making it especially useful for transport by road, air or sea. We recycle considerable quantities of paper and board in the UK. Most of it is used to make paper and board for packaging.

Paper and board packaging is useful because:

- the materials are light and easy to handle, store, fold and crease
- if combined with foil or plastic to form laminated packaging, special features are possible such as a seal that prevents evaporation and preserves the product
- colour printing to a very high quality is possible.

## **Metals**

Steel and aluminium are used a great deal in packaging, to produce cans, aerosols, foil containers and metal closures. There are various ways to make cans. Some cans are made of three pieces of metal (steel) - most food cans are of this type. Other cans are made from two pieces of metal (either aluminium or steel) and are used mainly for pet foods and drinks. About half of these drinks cans are made from aluminium, the others from steel.

More than 15 thousand million food, pet food and drinks cans are bought every year, with most homes using about 14 cans every week.



Canned food keeps well. As long as the cans are kept in a cool, dry cupboard, the food will last for many months or years.

They are very convenient because the food has already been cooked and can be eaten straight from the can or reheated with out further preparation

There is no need to add preservatives to canned food because the cooking and canning process preserves the contents until it is opened.

No food is wasted.

Drinks cans are a convenient size, and are easily opened, lightweight and easy to chill.

### **The food canning process**

The stages in canning are:

The food is prepared for canning.

The cans are cleaned by powerful jet blowers and rinsed in purified water.

As the open cans move along a conveyor belt, the food is put into them and a liquid (brine for vegetables; syrup or fruit juice for fruit) is added.

They are then moved on to a can-closing machine and sealed. Each can is checked to make sure it has the right content level: any shortfilled cans are automatically rejected.

The cans are placed into a machine rather like a giant pressure cooker. The food is cooked and

sterilised and the cans are cooled.

The conveyor moves on again. At this stage the cans are usually packed in 24s and the outer packaging is put on. They are placed by machine on cardboard trays and the whole pack is then shrink-wrapped in film and heat-sealed. Some cans are packed in cases made from corrugated board.

The final stage comes when the trays are loaded onto pallets and taken to a warehouse. Lorries collect them and take them to shops and supermarkets throughout the country.

## **Glass**

Glass is one of the oldest of the packaging materials So old, that collectors go around antique shops, searching for old beer and other bottles. Today, glass-making is a huge business and glass is a very popular choice for some foods.



The advantages of glass are:

- you can see the contents clearly
- glass bottles and jars can be opened and resealed easily
- glass does not affect the taste of the food inside
- glass is impermeable, which means that liquids and gases cannot leak into or out of it
- some glass containers can be washed and re-used
- the raw materials used to make glass (sand, limestone, soda ash) are cheap and in plentiful supply
- used bottles and jars can be saved in 'bottle banks' and recycled in a furnace to make more glass.

## **Wood**



Wood waste represents a significant proportion of the UK waste stream. Up to 25% of construction and demolition waste is wood. Wood is extensively used in packaging - with over 800,000 tonnes of wooden pallets are currently in circulation in the UK, and as such, a substantial amount is required to be recycled and recovered under packaging waste regulations. Forestry/saw mills and the pulping industries also produce wood waste.

Wood waste, principally a relatively inert, but organic material, which becomes a priority material because of the recovery requirements of the packaging waste regulations and the impending landfill directive legislation however processing and end markets of this waste material is a rapidly evolving field.

Newer technologies entering the market have the potential to significantly cut operating costs for processing wood waste, and are able to process wood to a variety of end market specifications. Efficiency is important as many processors operate to small profit margins. Similarly, there are new

technologies for compounding wood waste with recycled plastics to produce a variety of products, from window sills and door frames, to building sheets and roofing shingles.

Assuming successful separation and no contamination, wood waste can theoretically find as many applications as for virgin wood. Indeed up to 20% of the wood chip board manufacturing in the UK utilises recycled wood. Wood waste is already supplied to a number of existing wood markets. There is however, scope for increasing market share for wood waste in these markets and opening up new opportunities for recycled wood. Market opportunities for wood waste include:



### **Wood chipping**

The resulting product can be used as a weed-suppressing mulch, informal footpath, playground or bridleway surfacing, or fuel for automatic, hopper-fed, wood-burning boilers. Considerable demand comes from public authorities and other organisations engaged in landscaping.

### **Panel board**

A wood-based product used in construction, furniture making and packaging. There are three main types of panel board product: particleboards (such as chipboard), oriented strand board (OSB) and fibreboards (such as medium density fibreboard, MDF).

The panel board industry is the largest consumer of wood waste in the UK, recycling approximately 675,000 tonnes of post-consumer and post-industrial wood waste in 2001. Greater volumes of wood waste may be used in panel board production as production and cleaning processes improve.

Particleboard is produced from up to 60 percent waste wood in the form of wood particles, such as wood flakes, woodchips, shavings and sawdust.

MDF products contain smaller volumes of wood waste due to technical limitations in the production process.

### **Animal bedding**

Wood waste can be shredded to create comfortable, quality bedding for animals from horses to hens and hamsters. The low dust content of bedding made from wood waste – or from waste paper – can help animals prone to respiratory problems.

### **Charcoal production**

In an expanding British market, some 50,000 tonnes per year of charcoal are consumed by barbecue chefs. A growing proportion is home-produced as a high-quality by-product of hardwood forest waste. The remainder is imported: much from sources which contribute to the destruction of mangrove swamps and rainforests. Home production is mainly carried out by about 200 small-scale operators. A typical 'burn' takes a week, producing a third of a tonne of charcoal with a wholesale value of about £200 from 2 tonnes of waste. This industry is set to expand with the introduction of portable steel kilns, organised marketing, and support from important retail chains. It could provide an outlet for up to 300,000 tonnes per year of hardwood waste unsuitable for timber production, and an option for owners of neglected broadleaf woodland or tree maintenance contractors.