

BASIC RESOURCE RECOVERY METHODS

Resource recovery refers to the range of activities that are associated with collecting, transporting, processing and marketing materials recovered from the waste stream.

Different materials require different recovery processes to extract value from them, but the basic sequence is:

1. Collection of the material
2. Transportation to a processing facility
3. Processing it by sorting, baling or placing in bunkers
4. Storage
5. Transportation to market
6. Reprocessing or remanufacture



COLLECTION

Collection is one of the most complex parts of the process because collection and sorting systems have to be set up for different materials. Some can be mixed together, others cannot.

Under the Local Government Act, local authorities have a role to play in providing and managing household collection services. Council or a council contractor normally does this. Many local authorities subcontract to private companies or community organisations.

Collection services usually mean there is a kerbside collection service for householders and commercial collection services for businesses. Some communities have these services under a user-pays model while others are funded by rates.

These services can be backed up with a local transfer station, resource recovery park, recycling centre, unmanned drop off facilities or public place recycling bins. Resource recovery programmes might also include inorganic collections, hazardous waste collections or other one-off programmes such as electronic waste collections.

For farms, orchards and rural properties there are also collection services available for items like silage wrap, end of life tyres and various other farm and horticultural materials.

- In urban areas, key issues for household collections include:
- Providing services to as many people as possible – including sparsely populated areas
 - Covering the cost of collecting low value materials and higher value materials
 - Finding solutions or options for bulky household items such as old appliances, furniture etc.
 - Contamination of materials

COLLECTION CONTINUED

Businesses generally have more collection services available to them than households, as there is a much greater range of potentially recoverable material. Most businesses can have kerbside collection services similar households for paper, cardboard, plastics, glass and cans. Depending on the business activity they might have collections for scrap metal, shrink-wrap, cardboard, pallets, food scraps, liquid waste, electronic waste etc.

Key issues for business collections include:

- Limited range of collections for some materials such as polystyrene, treated timber and other construction waste. Usually only those regions with good markets have collection services.
- Voluntary nature – in most cases businesses engage services only if they choose to. Some local authorities encourage greater business recycling by providing education and other services such as waste exchanges.

TRANSPORTATION

Collections from households and businesses are achieved using various transportation methods. There is a range of technologies from low cost manual systems such as flat deck trucks to hi-tech side and front-loader compactor trucks. Council collection vehicles or private operators undertake transportation of recovered materials.

A big issue is the cost of transportation. Good clean recyclable material can be made worthless if it is from remote locations. This can make the cost of getting it to processing plants uneconomic. Recycling glass into new glass bottles and jars can pose a problem for South Island communities, as it is costly to transport and there is only one processing plant based in Auckland.



DROP-OFF AND PROCESSING

Recyclables are taken to a dedicated recycling site for processing. These recyclables will be dropped off in an initial indoor or outdoor receiving or stockpile area. The material might be co-mingled (mixed together) from a kerbside recycling collection or they might be source separated if the vehicle collects only one type of material such as cardboard.

INORGANIC MATERIALS

Processing systems vary but most materials require:

- Sorting into colours (glass), grades (paper and cardboard) or type (metals, plastics)
- Compaction and baling except glass. Systems vary from low-tech hand sorting to hi-tech automatic systems in purpose built Material Recovery Facilities (MRFs).

ORGANIC MATERIALS

Green waste and food waste require very different processing systems to inorganic materials. A number of processing systems are used, from simple outdoor windrow composting and worm-farming systems, to hi-tech in-vessel composting and anaerobic digestion systems.

STORAGE

Storage is required to consolidate loads for efficient transportation. Sometimes sellers hold onto material and wait for prices to rise if markets are low. Some materials like paper require covered storage. If indoor space is limited this can be achieved by storing material in shipping containers.

Commodities like glass, metals and plastics can be stored outdoors. Valuable materials like metals and flammable materials like plastics and tyres need to be kept in secure, fenced areas to prevent theft or arson.

If the markets are not commercially viable for materials, some councils have opted to store them either above ground or below ground in land banks. This is not common practice.



REPROCESSING / REMANUFACTURE

Many recovered materials from New Zealand are sold offshore to be remanufactured into new goods. They are sent by ship and are subject to fluctuating international commodity prices and shipping costs. Local re-processors that use recycled material as a feedstock have to compete with international buyers for these materials. Sometimes higher compliance and labour costs in New Zealand mean domestic manufacturers and buyers of recycled paper, plastic, metals etc cannot compete with overseas buyers that do not have similar manufacturing costs.