



The minimisation of waste and emissions is a major thrust within resource efficient and cleaner production (RECP) practices. Although it is not always possible, the target should be zero or near zero waste production for any process.

The waste management hierarchy is accepted nationally and internationally as a guide for prioritising waste management practices with the objective of achieving optimal environmental outcomes. It sets out the preferred order of waste management practices, from most-to-least preferred. It is very useful in any of the processes.

### Waste management hierarchy

CONSIDERATION	GOOD PRACTICE
<p><b>Quantity and type of waste</b></p>	<ul style="list-style-type: none"> <li>• Separate different types of waste at the point of production and keep a record of the quantity in each category i.e. metals (disaggregate), glass, paper / card, plastics (including packaging), organic, etc.</li> <li>• Set targets and create action plans for waste minimisation.</li> <li>• Review and assess effectiveness of plans and take corrective action as required.</li> </ul>
<p><b>Prevention and minimisation</b></p>	<ul style="list-style-type: none"> <li>• Prevention of the generation of waste is the first step towards eliminating waste.</li> <li>• This requires a deep look at the production processes with a view to convert raw material or feedstock more efficiently.</li> <li>• This can often be achieved by placing finer controls on the production system, which need not be costly.</li> <li>• Defining and working of critical operating and maintenance parameters is essential.</li> <li>• Use the continuous improvement process.</li> </ul>
<p><b>Reuse</b></p>	<ul style="list-style-type: none"> <li>• Unsaleable material which results from normal manufacturing is often returned to the start of the process for reuse. This saves the material from probable disposable but it usually requires additional energy for reprocessing. Improved production control can bring this consideration back to the minimisation, or even prevention categories.</li> <li>• Sorting of waste as described above simplifies reuse. It is also useful for recycling (refer to the section below).</li> </ul>



## Recycling

- If the steps in the hierarchy indicated above cannot be implemented, consider recycling the materials, possibly for reuse elsewhere, or convert them to a process feedstock. An example of the latter would be the granulation of plastic or the melting of metal.
- There may be an industrial symbiosis programme operating in your area. In which case, consider whether other businesses have a use for your waste in one of their processes.
- There are individuals who make a small income from waste collection and recycling. Consider giving appropriate waste to them. Waste that cannot be collected in this way can be sent to large scale waste recyclers.

## Energy recovery

- This applies to material which cannot be reused or recycled - such as food waste from markets and the hospitality industry - that is primarily organic in composition. The simplest use is to turn it into compost but greater benefit can be derived by first anaerobically digesting the material. The digestion produces methane gas which can be used for heating or cooking and the waste residue can then be used as fertiliser.
- This process is often called waste-to-energy (WTE). Converting non-recyclable waste materials into electricity and heat generates a renewable energy source and reduces carbon emissions. This is done by offsetting the need for energy from fossil sources and reduces methane generation in landfills.

## Disposal

- This is a last resort following an inability to follow the hierarchy. Disposal is the least desirable course of action as the material is likely to be sent to a landfill site. These sites are reducing in the volume they can absorb and the cost of disposal is increasing.
- Toxic waste needs removal by specialised companies.
- Municipalities have enforceable bylaws for the ultimate disposal of waste. Fines are payable for non-compliance.
- The sorting and categorisation of waste at source is helpful for correct disposal.

