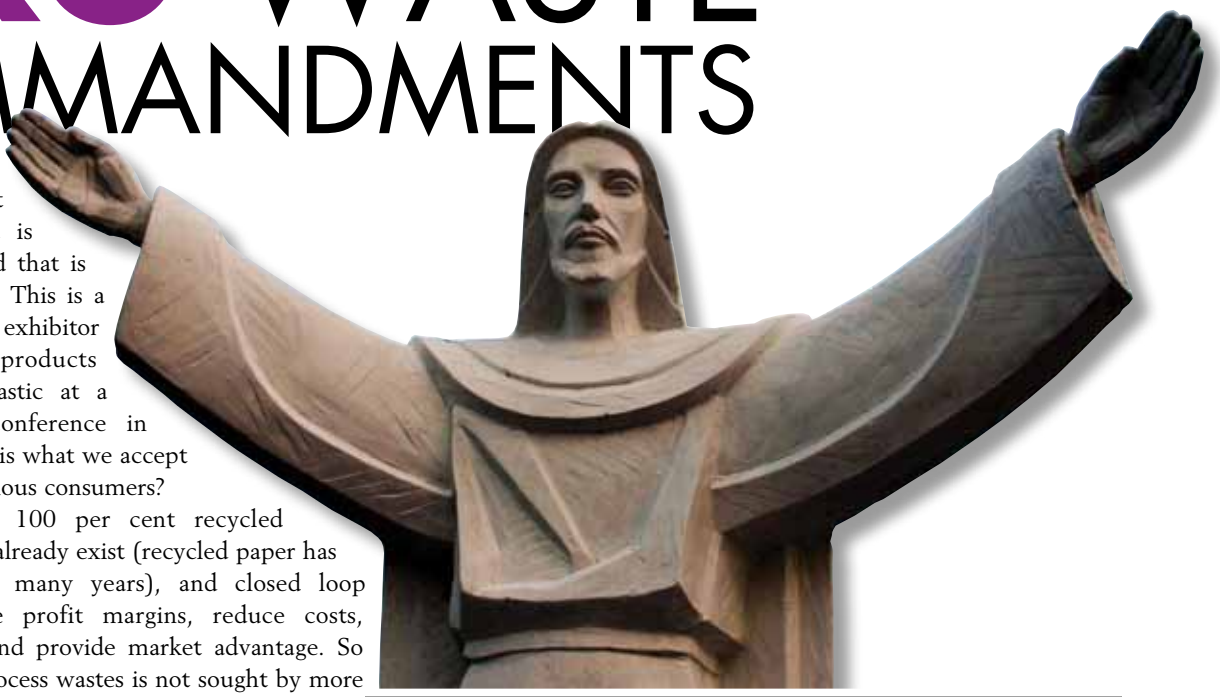
ZERO WASTE COMMANDMENTS



An aim for zero waste to landfill is an important driver for the nirvana of process optimisation, write Aaron Westwood and Duncan Freemantle.

"There is no such thing as 100 per cent recycled – our product is 97 per cent recycled and that is as good as you can get." This is a real quote from a US exhibitor marketing furniture products made from recycled plastic at a major environmental conference in Melbourne recently. Is this what we accept as environmentally conscious consumers?

Products made from 100 per cent recycled content are possible and already exist (recycled paper has been commonplace for many years), and closed loop processing can increase profit margins, reduce costs, open up new markets and provide market advantage. So why is it that reuse of process wastes is not sought by more manufacturers?

Diverting waste from landfill and examining alternative uses and disposal methods has obvious environmental advantages and can be an important driver for process optimisation, but process optimisation is not often approached from the end of the process.

Here we will examine the drive for 'zero-waste-to-landfill' and how it can help, whether for a whole company, a specific process or even a particular product.

1. Internal markets for your waste: First, look at options available internally, such as using process outputs as new inputs to your processes. Indeed, many process outputs retain essential characteristics of the inputs, allowing easy reuse in their existing form or with simple process and/or machinery modifications. If not, look at substituting inputs for alternatives that provide a more suitable output.

Examining internal markets can also lead to new product innovation and marketing advantages associated with using recycled content, plus provide the lowest cost handling option (such as cutting transport costs) and help promote the zero waste message within the organisation.

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Consider starting with a process audit. While most audits start at the front end and work through the processes/operations step-by-step, think about starting with the waste and working from back to front. This often promotes a different thought process and a better understanding of the actual processes, which can present solutions/alternatives that may not have been apparent using the more traditional 'front-to-back' audit.

2. External markets for your waste: Remember not to undervalue your 'product' (waste). Ask yourself, what does the end-user pay for the virgin equivalent? Explore the market and do your research, although Australia's long distances and small population and manufacturing base can pose a challenge.

Even the way you remove an item from your premises can determine whether you pay for the service or are paid for the product. Try not to ring for a 'quote' on the disposal of a material, but call as if you are a salesperson looking to sell a product.

And don't forget packaging; who knows, you may even have a new material/product you can offer at a far cheaper rate than competitors using virgin materials.

3. Understand processes and input/outputs: For those without intimate knowledge of their company's processes, build a working relationship with process engineers who possess a thorough understanding of the process inputs and outputs and their characteristics. This is critical for effective process modification, creating a saleable 'product' or finding alternative disposal methods.

You will also need a detailed understanding of output characteristics to ensure compliance with applicable legal requirements. (See next point)

Consider the product specifications end-users will be looking for, including colour, weight, density and level of contamination, and also whether input or process changes are necessary to provide an output that meets the required specifications.

Understanding inputs and outputs also provides the potential for identifying opportunities to reduce process waste internally; for example purchasing in bulk and modifying processes to accept bulk feeding.

4. Comply with legal requirements: Process outputs may be subject to specific regulatory requirements if they possess certain characteristics – such as containing hazardous materials – or are being used in certain situations, including land application and thermal recycling.

You must understand your legal requirements as well as your process outputs. For example, state governments have tightened regulations governing the sale of process wastes from sewage treatment plants for use as soil conditioners due to the risks of incorrectly treated sludge.

Transportation of some materials may also be subject to specific environmental and safety requirements including waste tracking, signage and security.

5. Contract management: You should use the supplier contract management process to control service provision, raw material specifications and packaging requirements.

Work with contract managers to include provisions that specify product take-back at the end-of life, and consider raw material specifications that reduce non-conforming product and wastage or ensure process outputs meet desired requirements.

Working with suppliers can also help reduce packaging and source recycled alternatives.

6. The engineering hierarchy of control: To facilitate a different approach to reducing waste, consider replacing the traditional waste hierarchy with the engineering hierarchy of hazard control. Think of the waste as the hazard/risk you tare trying to eliminate or manage, then apply the control hierarchy as follows:

- Eliminate process outputs by making them an input into another process (internal or external);
- Substitute process inputs for alternatives which meet desired characteristics for reuse and/or which produce less waste;
- Engineer processes to provide desired outputs or reduce outputs without alternative usage or disposal solutions;
- Use administration processes to raise awareness of zero waste commitments, communicate process requirements and provide an opportunity for employee input; and
- Alternative disposal solutions such as thermal recycling should be the last resort, the final barrier between you and the need to dispose of the waste to landfill.

7. Management support: Management support is critical to realising opportunities and ensuring a comprehensive approach.

The way a company and its employees approach process outputs can drastically influence their capacity to reduce outputs and waste. Consider using cost accounting tools such as 'return on investment' calculations to support the case for change and inform decisions.

Management will need to ensure sufficient resources are allocated, including people, research, capital, specialist skills and technology. New and changed processes often require re-training of the workforce, so any changes should be sufficiently resourced throughout the entire change.

8. Mass balance for verification: Consider completing periodic mass balance calculations to verify outputs and whether you are meeting zero waste to landfill commitments. You may need to repeat the exercise after input or process changes.

Mass balance is also an important tool for internal management reporting, exploring opportunities for improvement and maintaining external credibility associated with any marketing claims relating to product reuse and/or zero waste.

9. Contractor/customer evaluation: You should work with relevant personnel, including contract administrators, to maintain good working relationships with 'customers' reusing your waste products.

A simple evaluation of contractor or customer processes can be used to validate claims regarding the use or reuse of these products. The results of the exercise may also help maintain industry credibility or product certification.

For more complex external reuse processes, it may be necessary to instigate a program of audits/inspections to ensure sites are visited and to track your product from the source to its final destination. This may not be possible in all cases and alternative methods may need to be used.

10. Identify and pursue opportunities: Not only must the company strive and lead by example, but it is imperative that all employees are all on board and maintain a common aim for process efficiency. You will need to anticipate product/company changes, perhaps with the help of a robust organisational change management process.

New communication mechanisms may even be necessary to reach the target audience and provide opportunities for employee feedback and suggestions on continual improvement.

Aaron Westwood is director of Newcastle sustainability consultancy Exis (exis.com.au); Duncan Freemantle is director of Melbourne sustainable products consultancy Green Echo (greenecho.com.au)