

## James Hardie industrial ecology initiatives

### Introduction

James Hardie is a leading international building products company, a global leader in fibre cement technology and supplier of well-known brands of fibre cement products. This case study outlines the initiatives that James Hardie has been taking to reduce waste across their manufacturing process to produce products and materials with a smaller environmental footprint.

The market for fibre cement building products is growing. It is being used increasingly in the exterior and interior of buildings, for example, exterior cladding, internal lining, facades and flooring. James Hardie continues to research and develop products that help to achieve sustainable construction. James Hardie strives to manufacture products that are low in embodied energy (compared to functional alternatives), low maintenance, durable, require lighter frames and construction techniques, do not emit volatile organic compounds, can be put up quickly with few trades and can be used to create energy-efficient buildings in all climates.

A primary focus is to reduce waste. This is achieved by increased plant efficiencies which reduce environmental impact by optimising the conversion of valuable resources and energy into high-value building products.

Yield improvements are achieved by reusing manufacturing by-products in the manufacturing process as raw materials and recycling by-products as resource inputs into other processes. The composition of fibre cement by-products is primarily sand, cement and cellulose. These valuable resource inputs are used in other building materials, enabling recycling and by-product substitutions with other building product manufacturers.

### Use of recycled and re-used material

James Hardie reuses several process by-products internally and externally.

These include:

- recycling a proportion of by-product into the manufacture of pallets. This by-product, which may otherwise go to landfill, replaces timber components on some pallets and helps to reduce demand for timber
- partnering with a major cement manufacturer where the by-product is reintroduced into the cement manufacturing process. This helps to reduce the demand for natural quarry materials used for cement manufacture
- partnering of the Rosehill plant with a major producer of road base materials where by-product fines are reducing the demand for crushed materials. The result of these efforts is that the James Hardie Rosehill plant has reduced its landfill footprint by over 80 per cent, eliminating 16 000 tonnes of waste to landfill per year.

### Drivers and benefits

Drivers:

- Ongoing research and development into manufacturing process efficiency
- Corporate social responsibility program
- Cement manufacturers initiatives to source alternative materials for cement manufacture and process improvement

Benefits:

- Environmental benefits—reduced demand for natural resources and energy by James Hardie and its partners reduces environmental impact. Resource efficiency initiatives are reducing demand for natural forestry and quarry materials such as timber, sand, limestone and other quarry products
- Social benefits—reducing reliance on landfill extends existing landfill capacity. Reducing demand for natural materials extends available resources for future generations.
- Economic benefits—by maximising efficiency and replacing valuable natural resources with by-products there are commercial benefits for James Hardie and its partners.

In a model for industrial ecology, James Hardie has partnered with a customer for which offcuts of James Hardie products are returned to James Hardie for recycling. This may evolve into a product stewardship scheme.

### Problems and challenges

A major challenge in by-product substitution was the reclassification of James Hardie fibre cement by-product as a resource under the New South Wales *Protection of the Environment Operations (Waste) Act 2005 (POEO)*.

Another challenge was identifying opportunities to work with partner organisations for product synergies. The opportunities had to be able to deliver environmental, social and economic benefits for both James Hardie and partner organisations.

### Solutions

To deal with the reclassification of the fibre cement by-product as a resource under the *POEO*, James Hardie worked with the New South Wales Office of Environment and Heritage supported by the Sustainability Advantage Program. Now it has been achieved the project is yielding the significant environmental benefits described above.

### Opportunities for other projects

There is great opportunity for industrial ecology across the construction supply chain sector. For building materials and products with common raw materials there are many opportunities to exchange by-products. Some of these are being facilitated by the Waste Management Association of Australia through the Australasian Industrial Ecology Network.

### Contacts and links

Industrial Ecology Network

<http://www.austindustrialecology.com.au>

James Hardie

[www.jameshardie.com.au](http://www.jameshardie.com.au)

Cement Industry Federation

[www.cement.org.au](http://www.cement.org.au)

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