

Cleaner Production Case Study

Cleaner production involves reducing the consumption of raw materials (including water and energy) and reducing the volume and toxicity of waste and other emissions.

Industry:

Water heater manufacturing

Rheem Australia Pty Ltd

Rheem Australia manufactures gas, electric and solar water heaters for domestic and commercial applications.

Company characteristics:

Rheem started operations in Australia in 1936 as the first overseas venture of Rheem manufacturing company, an American drum manufacturer. Rheem Australia is now a wholly owned subsidiary of Paloma Industries, Japan. The company headquarters and manufacturing operations are located in the Sydney suburb of Rydalmere.

Environmental successes

This is one of a series of case studies featuring companies that participated in the Department of Environment and Conservation (NSW) \$5 million 'Profiting from Cleaner Production' – Industry Partnership Program.

NSW companies are discovering that cleaner production not only protects the environment but also reduces operating costs, streamlines processes, boosts profits and improves staff engagement and morale.

Water heater company turns up the heat on cleaner production

As a company keen to commit to sustainability, Rheem could see great potential in adopting a cleaner production approach to its operations. It started by looking at compliance with environmental regulations, then moved on to undertaking a detailed cleaner production self-assessment.

What did they do?

Set up baselines for comparison

Rheem's self-assessment included reviewing its use of resources (raw materials, water, energy etc.) and waste management.

Baseline data was established for use of resources, with comparisons recorded at regular intervals. This made it possible to prioritise activities based on fact, so that environmental priorities could be aligned with other operational priorities when allocating time and capital.

Reduce stormwater pollution

Rheem made a number of site improvements, including upgrading rain protection and bunding, to reduce the risk of stormwater pollution:

- **Transport rails**, part of a hydraulic press system, become coated in oil during operation and are frequently interchanged to allow for different water heater models. An awning has been erected above the area where they are stored to keep rain off. Bunds have been installed and an existing waste drain has been extended to collect any run-off.
- Some **steel scrap bins** were leaking oil and water. They have been moved to a single bunded area protected from rain by an awning. A sump has been provided to collect any run-off.
- **Steel mesh covers** have been fitted to drains to collect litter.

Educate employees

Education has been given high priority. Employee understanding and acceptance of the cleaner production approach is vital to the program's success. Weekly 'toolbox talks' keep everyone up to date with the cleaner production initiatives and gather employees' input.

Reduce energy consumption

Energy reductions have been achieved with the support of the NSW Government's Sustainable Energy Development Authority, through its Energy Smart Business Program.

Rheem selected key performance indicators (KPIs) to establish benchmarks for improvement. The KPIs relate directly to production output:

- electrical units of energy for every water heater manufactured
- gas units of energy for every water heater manufactured.

A 10% reduction in consumption over two years was set as a target.

To achieve this, major use areas were identified, including air compressors, lighting and furnaces.

Air compressors

Air compressors were logged to check power consumption. Air leaks were identified and repaired, and timer controls were fitted to eliminate unnecessary running time. Rheem now realises how inefficient the existing set up is, and intends to replace two compressors with one larger one.

Lighting

Timer controls were used to regulate supply. Light sensitive switches were installed so artificial lighting adjusts according to external conditions and time of day.

Furnaces and ovens

Furnace throughput speed was adjusted to match production requirements. Tests are being conducted to determine if one of two gas-fired ovens can be eliminated.

Cooling towers and hydrostatic pumps

Timer controls were installed to regulate cooling tower operating hours. Existing speed controllers were used to reduce the speed of the pumps in the hydrostatic test area when there is no demand for water.

Introduce recycling

A major effort is underway to divert plastics, cardboard and paper away from landfill. Early results are very encouraging, with 4 tonnes diverted in the first month.

Why did they do it?

Rheem joined eleven other like-minded companies as part of a metals industry cleaner production 'cluster', facilitated by the Advanced Manufacturing Centre as part of the Department of Environment and Conservation (NSW) Industry Partnership Program. The companies meet regularly to share ideas, find solutions to common problems and discover cleaner, smarter ways to run their businesses. For Rheem, the metals cluster provided the focus and motivation to begin a systematic review of its operations.

What are the environmental gains?

- Energy reduction: 1,229,000 kWh per year.
- Reduction in CO² emissions: 1,244 tonnes per year.
- Packaging initiatives: 200 m³ diverted from landfill per year.
- Recycling: 4 tonnes diverted from landfill per month.
- Stormwater contamination has been eliminated.



Scrap bins are now located in one bunded area.



Stackable tote bins are used for sorting materials for recycling.

What were the costs and savings?

Energy reduction projects:	One-off costs	Savings per year
Air compressors	\$23,000	\$44,000
Lighting	\$2,000	\$7,000
Cooling towers	\$1,000	\$2,000
Hydrostatic pumps	\$1,000	\$2,000
Packaging projects:	\$15,000	\$10,000
Stormwater management projects:		
Transport rail storage area	\$25,000	–
Scrap bins	\$50,000	–
Enamel mixing area	\$8,000	–
Stormwater drain protection	\$4,000	–
Total costs & savings	\$129,000	\$65,000

Where to now?

Rheem plans to treat all liquid waste on-site. Liquid waste (mainly a mixture of water, detergent and oil) is currently removed from site by a waste contractor. The plan is to separate the oil and detergent from the water, dispose of the water to the sewer (or reuse it if possible), and collect the oil and detergent for disposal or recycling.

Now into its second year of the program, Rheem sees cleaner production as a permanent part of its ongoing commitment to excellence in manufacturing.

More information

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