

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

Ozone laundering

03 Wash Pty Limited

03 Wash Pty Ltd was established for the specific purpose of bringing ozone technology to Australia by helping Australian commercial laundry operations introduce ozone washing systems. A cleaner production alternative, the ozone washing system can help laundry companies reduce their consumption of energy and natural resources, and reduce their operating costs. 03 Wash imports equipment not available in Australia, facilitates the design of the washing system and oversees installation and initial operation of the equipment.

Company characteristics

03 Wash Pty Ltd is a small start-up company with two Australian partners.

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.

Ozone company cleans up in the laundry

03 Wash has brought to Australia the benefit of American and European experience with ozone laundry technology. Ozone is an ecologically friendly chlorine alternative, which, after a short time, readily reverts back to oxygen. Ozone is widely accepted in American and European commercial laundries but was not used here in Australia. Evidence from America suggested ozone laundry systems could save 25% on chemical use, 40% in electricity and 20% in water use when compared with conventional systems.

What did they do?

Conduct a trial

03 Wash decided the best method of introducing the new technology would be to conduct a trial to demonstrate its suitability for Australian conditions. The site chosen was Our Lady of Consolation Nursing Home at Rooty Hill in Sydney's west. This laundry was chosen for a number of reasons, mainly because it was relatively new and purpose-built. It was operating efficiently and had daily records of the weight and type of each load of washing.

During the trial the full chemical formula program was retained as an immediate alternative in case the ozone system failed, eliminating the possibility of downtime for any of the washing machines.

Set up baselines for comparison

03 Wash installed water meters to record cold water, hot water, and water for steam generation, as well as a gas meter. All four meters were read by laundry staff on a daily basis. Integral Energy was contracted to provide electricity metering to the main switchboard in the laundry building, with electricity data provided in 15

minute intervals. The incumbent chemical supplier, Ecolab, provided data on the wash formulas for each type of wash load. All of this recorded data, including the wash type and weight, provided a good comparison for the 'before' and 'after' ozone case.

In addition to this data collection, the quality of the wash was checked—before the move to ozone and after the ozone was introduced—using the Australian Wool Testing Authority's measures for laundry effectiveness.

Install the ozone system

Ozone has a very short life cycle so an on-demand system is the safest and most effective method of delivery. The ozone system has four main components:

Air delivery

An oil-free air compressor with an air dryer delivers clean, dry air. Clean, dry air is essential to ensure that no contaminants are delivered to the ozone generators.

Ozone generators

Four separate ozone generators pass low pressure air through a high voltage electrical field to create ozone from the oxygen in the air. The four separate generators supply ozone to four washing machines, with a control panel that allows the machines to be isolated for maintenance.

Controls

The controls are integrated with the existing washing machine controls to ensure that ozone is delivered at the correct time and in the correct amount. There are four separate sets of controls to allow easy isolation so there is no down time for the laundry in the event of a failure.

Ozone injection

Ozone is delivered to the washing process via injection. There are various methods of ozone injection depending on the washing machine type and size.

For this installation a closed-loop pumping system was selected whereby the water from the machine is drawn out through the loop via an inline strainer to remove lint. The ozone is injected directly into the discharge side of the pump and returned back into the washing machine.

Commission the ozone system

An expert in ozone laundering, Jack Reiff, was brought out from the United States to set-up and commission the system. Because of the system selected by O3 Wash and the method of installation used, the entire system could be tested without any disruption to the laundry operations. O3 Wash developed changes to the wash formulas in conjunction with the incumbent chemical company, Ecolab, who re-programmed the machines with the new reduced formulas.

Switch to ozone laundering

The ozone system was installed over a period of five days with no production loss to the laundry.

O3 Wash set out to make the change-over as easy as possible for laundry staff. In essence, the staff went home one night after using the standard chemical wash and next morning started work using the ozone system, with the only noticeable change from their point of view being a different coloured program selection sheet. A very positive outcome for the staff was the lack of chemical smell when removing washing from the machines.

Monitor performance

Data was collected after the ozone system was turned on and washing had been done using the new system. Performance monitoring included water, gas and electricity consumption as well as testing the wash quality.



Why did they do it?

Ozone is used extensively in the United States and Europe, across a variety of commercial and industrial processes, but in Australia it had mainly been used for purifying drinking water and for some industrial applications. It was time to broaden the application of ozone in Australia.

Laundries were selected as a starting point because of the commercial and environmental benefits that ozone delivers. The cost of introducing an ozone system into a laundry can be well justified by the savings generated. Commercial laundries have long been recognised as large consumers of energy as well as water and chemicals, most of which are discarded into our

waste water systems. Reducing raw materials, chemicals and energy will benefit everybody involved in the washing process as well as the environment in general.

Waste water quality has improved due to reduced chemical use.

Independent tests have shown that:

- wash quality has been maintained and even improved in some areas.
- linen will last longer due to reduced chemical and mechanical action.

Productivity has improved due to the reduced time taken for each load of washing. The trial site has increased its intake of laundry from other nursing homes and has substantially boosted revenue from its laundry operations.

What are the environmental gains?

Energy reduction	62%	48,497 kW.h per year
Reduction in CO ₂ emissions		46.5 tonnes per year
Water savings	15%	1,100,000 litres per year
Chemical savings	15%	1,250 litres per year

What are the costs and savings?

Annual savings for the trial site, based on current production levels are:

Water	\$2,200
Electricity	\$5,100
Chemicals	\$2,500
Linen replacement	\$1,500
Productivity	\$30,000

Total savings are therefore conservatively in the order of \$41,300 per year. This represents a financial payback of about two to three years for a typical system.

Jack Reiff overseeing installation of the new washing system. The system was installed over a period of five days with no production loss to the laundry. The facility has now increased its intake of laundry from other nursing homes and has substantially boosted revenue.

Where to now?

The trial has proved that using ozone in Australian commercial laundries reduces water, energy and chemical consumption while saving time and improving linen life.

O3 Wash Pty Ltd has been able to demonstrate to the nursing home industry that this is the way of the future, and has proposed setting up a system with a large hotel chain. O3 Wash anticipates similar success for other service industries with large laundry systems and is planning to offer the system to commercial laundries throughout Australia.

More information

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