

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:

Logistics and supply chain

Siemens Dematic

Siemens Dematic develops supply chain and logistics solutions. Its services include product engineering, materials handling, manufacturing, logistics, automation and information technology.

It provides integrated systems for every aspect of the supply chain, including warehousing, retail distribution, cold storage and e-business supply.

Company characteristics

Siemens Dematic is a subsidiary of the global company Siemens AG which employs 450,000 people worldwide and has annual sales exceeding A\$135 billion.

The company's Australian operation employs 350 people and is located at a \$20-million head office and manufacturing facility at Belrose in Sydney's northern suburbs.

The facility is fitted out with state-of-the-art design and manufacturing technology including system simulation software, sophisticated laser-cutting equipment, robotic welding, high-speed powder coating lines and computer numerical controlled (CNC) machinery.

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.

Cleaner 'business as usual' for supply chain and logistics company

Siemens believes that improving environmental performance makes good business sense.

Siemens updates its manufacturing strategy every year, and is able to weave cleaner production principles into the fabric of the organisation rather than treating them as a series of one-off initiatives. The company ascribes its successes to date to three major factors: developing innovative partnerships with suppliers, upgrading technology and effectively engaging staff in continuous improvement.

What did they do?

Integrate cleaner production with continuous improvement

Siemens cleaner production program started with self-assessment, including developing a 'waste map'—a tool to identify and quantify waste avoidance and resource recovery opportunities.

The company doesn't differentiate between cleaner production and other continuous improvement activities— they all fit within the strategic plan.

Involve employees

Siemens is firmly committed to employee involvement. A 'high performing, safe and proud workforce' is one of its major objectives.

Involve suppliers in developing sustainable solutions

Sheet steel used to be delivered on wooden pallets that were sent to landfill after a single use. As a first step Siemens negotiated a pallet return system, prolonging the life of each pallet to three or four uses. Siemens and the supplier then agreed to find a more sustainable solution. They came up with purpose-built steel pallets—the supplier providing the material and Siemens providing the design and manufacture.

The concept has been extended to cardboard stillages, resulting in a standardised heavy-duty stillage which can be used many times and eventually recycled. The new stillage eliminates the need for pre-delivery plastic shrink wrapping of components, stopping yet another item going to landfill.

Introduce a laser cutting system

Material yield is a critical for Siemens because many of its operations involve cutting out intricate shapes. Siemens replaced an energy-hungry and inflexible process involving guillotines and presses with a highly efficient Cincinnati laser system. The capital purchase, including 'nesting' software, paid for itself in just over two years.

Use housekeeping to involve staff in cleaner production

Staff commitment turned good housekeeping into a cleaner production winner. Staff were given the challenge of analysing three months of housekeeping audit results with a more critical eye. A focus on simple tasks, such as cleaning machines and removing grease, unearthed major issues including oil, energy and water wastage, floor contamination, a potentially unsafe work area and unmeasured CO² emissions. Having pinpointed these issues, the company could work out how to deal with them.

Fix leaks in the air system

Siemens developed a program to track leaks in the compressed air system. The biggest source of leaks was a pneumatic fitting called a pressure regulator. One type of regulator stood out as a major under-achiever. These were replaced by the supplier at no cost to Siemens.

Siemens also discovered that using comparatively inexpensive rubber and plastic pneumatic hoses was false economy.



They were becoming damaged in the aggressive operating environment and needed frequent maintenance and replacement. The hoses have been replaced with longer-lasting copper fittings which have reduced machine down-time.

What are the environmental gains?

Due to the steel pallets

- Tonnes of wooden pallets are no longer sent to landfill.
- Raw material costs are lower because packaging material has been eliminated.
- Damaged wooden pallets are no longer a safety risk.

Due to the laser cutter

- Material yield now stands at better than 90%, an increase of 30%.
- Utilisation of steel has increased by \$300 per tonne, an enormous amount given the volume of steel consumed each year.
- The laser's capabilities have enabled many components to be re-engineered, eliminating costly tooling, jigs and fixtures. This has reaped savings of hundreds of thousands of dollars per year.

The volume of scrap metal waste has reduced substantially (as has the energy required to re-process it for reuse elsewhere) and handling and transportation costs are lower.

Costs, savings and benefits

	One-off costs	Savings per year
Steel pallets	\$20,000	\$10,000
Laser technology	\$1.25 million	\$800,000
Housekeeping	\$7,000 (scrap disposal)	\$8,000
Liquid waste disposal	\$30,000 (ultra-sonic equipment)	\$25,000
Totals	\$1.3 million	\$843,000

Environmental benefits and flow-on effects

Steel pallets	300 tonnes of timber pallets removed from landfill
Raw materials	reduction of 2,666 tonnes of steel per annum
Energy costs	2,106,000 kW saved
CO ² emissions	2,132 tonnes of CO ² not being released into the atmosphere
Laser technology	reduced energy costs, handling costs, noise pollution & oil leaks
Housekeeping	reduced CO ² emissions, water, energy; improved OH&S
Liquid waste	caustic solution to be eliminated; a safer, cleaner environment, reduced handling costs, improved production throughput.

Equally important are the flow-on effects, such as improved safety conditions, reduced energy and materials handling costs, and decreases in noise pollution and potential for oil leaks.

Why did they do it?

The catalyst for these initiatives was Siemens' involvement with a metals industry 'cluster' facilitated by the Advanced Manufacturing Centre.

Siemens' Manufacturing Manager, Robert Norton, believes the program has many benefits to offer:

- networking with other companies; tapping into their commitment, support and motivation
- visiting other companies' sites
- meeting industry experts and specialist presenters
- developing a collaborative relationship with DEC.

Where to now?

Ultra-sonic cleaning

Trials are assessing the use of ultrasonic cleaning in the powder-coating process. At present a highly caustic liquid is used to strip excess paint from equipment. The liquid is a potential safety hazard, is difficult and

expensive to dispose of, and is used in large quantities. Siemens is hoping to replace this with an ultrasonic process that strips paint using sound waves coupled with a biodegradable liquid.

Growth, reward and recognition

Siemens employees will soon have direct input into the scope and content of their own growth and development program, and decide for themselves how they would like to be recognised and rewarded. Siemens has high hopes this program will yield huge results in morale, safety, productivity, quality, innovation and motivation.

More information

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