



CASE STUDY 1: DMG Industries

Achieved a 9% p.a. electricity saving through optimising manufacturing processes

SIDEBAR ITEMS TO THE RIGHT OF THE PAGE:

SNAPSHOT:

Partner	DMG Industries Pty Ltd
Project title	Energy efficiency for Production Line Processes at DMG.
Objective	Install production process control equipment designed to significantly reduce electricity use of production equipment.
Plant type	Plastic moulding equipment for producing automotive parts.
Technology description	Programmable Logic Control.
Plant capacity	Production uses a minimum of 10,729 MWh per year.
Electrical savings	Approximately 934 MWh per annum (for all 3 stages).
\$ saving	\$70,000 to \$100,000 per annum depending on production levels (9% saving on electricity bill).
GHG pollution offset	1,350 tonnes (equivalent to 310 cars taken off the road).

> FAQs

FAQ (Frequently Asked Questions) is a dynamically evolving guide that explains the complex terms and jargon contained on this site. If there's something you don't understand or would like to contribute to enable reader comprehension, you can add your suggestions here.

> SUPPLIERS

>>Links here

> GRAPHS (based on information exchange)

Daily profile of savings

Monthly profile of savings

Annual profile of savings

Other (change: productivity, reject rates, \$/unit)

> FORUMS

Join our online community and become part of the Business Energy Innovation Initiative (BEII). Sustainability Victoria's Forums are a dynamically evolving space where new ideas, innovation and integration of information can occur.

– Access to the industry Discussion Forum where you can post and respond to questions about improving energy use and how it can benefit your business

– Ongoing advice from industry experts and managers who have participated in Sustainability Victoria's BEII.

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> LINKS

A list of other links relevant to the case study could be included here.

>1. OVERVIEW

DMG Industries Pty Ltd is a supplier of plastic injection mouldings from concept to part delivery. They employ 570 people in their Keysborough, Victoria plant to service Australia's automotive industry and clients throughout Asia, Africa and Europe. DMG has a base annual electricity consumption of 11,000 MWh. Sustainability Victoria helped DMG identify significant energy and productivity gains that can be made through optimal manufacturing processes including a reduction in production line equipment heating and cooling, switching off motors that are not in use and reducing the peak load.

> 2. PROJECT DESCRIPTION

The hardware for the project is standard and was purchased off the shelf. The system required control boxes to be integrated into the plant enabling central control of the production line processes by computer. Software was designed and written specifically for the site's requirements.

Specifically, the PLC system monitors and controls the cycling times and the energy consumption of the injection moulding machines. The shorter the cycle time for the machines the lower the energy consumption, which also has the flow-on effect of minimising the motor use and relieving peak load.

Stage 1 of the project is designed to introduce the control technology to the process line that has the most significant energy demand (65% of the electricity demand for the site). Stage 1 of the project was estimated by DMG to cost \$80,000.

DMG has planned three stages for the project. If successful the project will be rolled out to stages 2 and 3, which will cover the entire plant.

Sustainability Victoria's involvement has been ongoing, including support for the detailed design and demonstration of the project outcomes.

The project commenced in June 2004 and is expected to be commissioned and in operation by December 2005.

> 3. EXPECTED OUTCOMES

Once all stages have been completed DMG estimate a 9% reduction in the sites requirement for electricity (934 MWh), a \$70,000 to \$100,000 saving per annum.

Productivity improvements also attract significant savings, estimated by DMG to be \$217,000 per annum. These savings are expected to be achieved through reduced maintenance and labour costs.

Implementing Sustainability Victoria's recommendations will result in a simple payback for changeover costs in less than 3 years. The energy cost for operation has reduced due to lower idle times of injection moulding machines.

This will also result in greenhouse pollution reduction of 1,350 tonnes of greenhouse pollution per annum, which is the equivalent of removing 310 cars from Victorian roads.

>4. LEARNINGS

After installation of the PLCs and panels it was found that the heating/cooling of the dies was the least controlled process. This process has since been modeled and found that an algorithm can be written to control cooling tower use, heat exchanger use and chilled water use for temperature regulation of the dies.

These systems were controlled manually using a float valve and temperature gauge resulting in a temperature range of 13-23 degrees; but now two new valves + programming (\$4,700) will more efficiently use chilled water, heat exchange and cooling towers. Currently each machine has a chiller but, as a result of this, they are changing to a group chiller, which will be more efficient across a number of machines.

The injection moulding cycle times reduced overall from 95 to 65 seconds, resulting in injection moulding process improving from 60% to 80% efficiency.

Product quality improvements increased due to a better understanding about process variables.

Significant cost savings are estimated due to lower number of rejects for moulded parts from the injection moulding machines enhanced quality assurance.

>5. COMMENT ON THE CASE STUDY

[>>Site Manager's comments](#)

The Site Manager will be regularly updating this case study to keep you informed of its progress.

[>>Link to forum](#)

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