

Grant helps plastics business explore new technology



Talbot Plastics Ltd

Energy is a major cost in producing the plastic componentry of today's appliances.

To explore the energy saving potential of new technology, Talbot Plastics approached the Energy Efficiency and Conservation Authority (EECA) for a grant to help fund the difference between a hydraulic-powered moulding machine and an all-electric machine.

Christchurch-based Talbot Plastics employs around 100 staff producing components for other hi-tech manufacturers in New Zealand and overseas. Working from purpose-built new premises occupied three years ago, it places itself in the top decile of the industry's injection moulding and contract manufacturing sector.

Moulding machines are fundamental to the business, and Talbots has 25 of them ranging in size from 22 tonne 'clamp force' to 680 tonnes.

Hydraulic-powered machines have been the standard for many years now, but recently electric-drive has emerged as a technology for the future.

At this stage however the new technology comes at a premium. For its latest machine, Talbots chose a 100 tonne electric-drive machine that cost around \$34,000 more than the closest hydraulic equivalent.



Talbot's General Manager John Lovett checks the open mould of the new electric-drive injection machine.

Uses only 35% of the energy

Post-installation metering has found that, compared with its old hydraulic machine, the new unit consumes only 35% of the energy. The new machine's average load for 120 plastic injection 'shots' per hour is 2.5kW, compared with 7.0kW for the older machine.

Over a year, this reduction will save Talbots \$1,700 in energy costs for this machine alone and deliver CO₂ savings of nearly 11.8 tonnes a year.

While worthwhile, the total savings at the current cost of the unit create a simple payback for the extra investment of 7.5 years.

The payback is longer than anticipated, but Talbots points out that actually using an electric-drive machine was the only way to get accurate figures in its particular operating environment.

"There are consumption figures out there," says General Manager John Lovett, "but actual performance is dictated by the mix of long- or short-cycle work the machine is required to perform."

Long-cycle operations involve making thicker items with relatively few movements. Short-cycle operations require more movements of the machine, and here electric-drive would be less efficient.

John also points out that electric-drive technology is still emerging. As it becomes more common, the price differential will hopefully narrow.

Talbot Plastics considers the project a success for itself, with potential benefits for the industry as a whole.

Extra benefits

John reports there are a number of extra benefits.

They include greater consistency and improvements in accuracy. (According to the machine's supplier, independent tests show accuracy can improve ten-fold.) Combined, these have helped lift product quality.

Other benefits include reduced maintenance (the supplier predicts up to 50% less); a reduction in consumables (of course, eliminating hydraulic oil); reduced demand for cooling water; and a noticeably quieter and more operator-friendly workspace (hydraulic machines are notoriously noisy). Because an electric-drive machine reduces power cable sizes required, installation costs can also be lower.

One important feature of the electric-drive machine was the impressive, built-in power factor correction. If Talbots had not already had power factor correction, its payback would have been further reduced. Another company may enjoy that benefit and also save on having to add extra capacitance to its main distribution board.

Talbot Plastics considers the project a success for itself with potential benefits for the industry as a whole. As John Lovett observes "It's more than just a lower power cost - there's a lot in the equation. If we had to buy another moulding machine now we'd seriously consider going with electric-drives again."



Dishwasher cutlery baskets are among the injection-moulded components Talbots produces.

Cost savings from electric-drive technology

Average load at 120 shots/hr	
Old machine	7.0kW
New machine	2.5kW
Annual usage (typical)	
Old machine	29,400kWh/yr
New machine	10,500kWh/yr
Savings	
Annual	18,900kWh/yr
Demand	4.74kVA
Financial (includes maintenance and running costs)	\$4,510
CO ₂	11.8 tonnes/yr

EECA grants

Grants for demonstration projects are available to businesses in energy intensive sectors. Grants of up to 40% of the capital cost of the project are available, with a maximum of \$100,000 for each grant. EECA is looking to support energy efficient technologies that are commercially available but are not yet commonplace in New Zealand.

EECA grants are available for businesses from the following sectors: heavy transport fleets, wood processing, basic metals, glasshouse crops, irrigated dairying, irrigated arable crops, food and beverage processing, fishing fleet operation and non-metallic products.

Other businesses where energy is greater than 5% of their total business costs are also eligible.

CONTACT

For more information on EECA's technology grants and services, call 0800 358 676 or visit www.eecabusiness.govt.nz/eib