



### PROJECT RESULTS

- \$29,000 in annual energy cost savings
- 213,000 kWh in annual energy use savings
- \$14,250 program incentive from PG&E
- Simple payback of 6 months

*“The installation of the variable volume injection molding machine was very successful. Not only do we really notice the energy savings, but the new machine helps us be more productive because the new technology allows us to produce components that require greater control.”*

Ebi Mogharei  
Hayward Plant Manager  
INJEX Industries

## PLASTIC COMPONENT MANUFACTURER GETS SERIOUS ABOUT ENERGY EFFICIENCY

**In 2006, Injex Industries, Inc. made an important commitment to energy efficiency.** Anticipating future production increases for existing and new product lines at their Hayward, California, plant, Injex management knew they would need more injection molding machines. At the same time, plant managers were concerned about energy use. Because of their knowledge of PG&E energy efficiency programs, it was not long before Injex decided to work with PG&E representatives to find the most efficient injection molding system that would enable them to meet their anticipated production goals, while keeping energy consumption down.

### INJEX

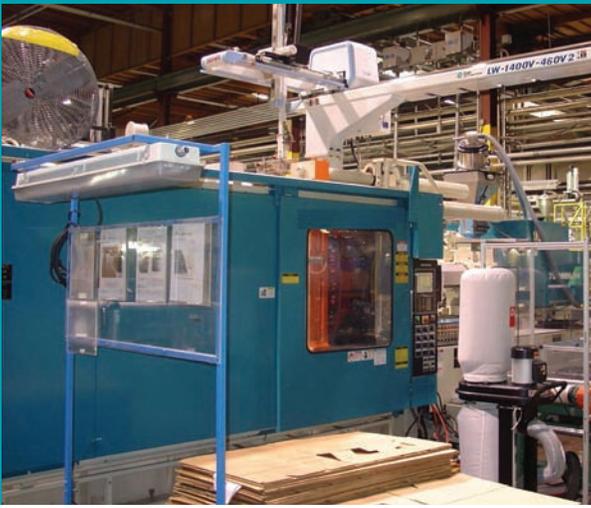
Established in 1984, Injex produces plastic interior trim components for cars and trucks. Every day the company’s 360 employees produce 62,000 finished parts in their 98,000 square foot facility in Hayward for the New United Motor Manufacturing Inc. auto factory in Fremont. Currently, most of Injex’s 31 molding machines are constant volume units where a hydraulic pump provides a constant oil volume creating the same pressure regardless of actual demand requirements. Because the molding process creates intermittent demands, excess oil flow is created during periods of low demand, leading to energy waste.

### OPTIMIZING EFFICIENCY

Because Injex needed a 720-ton injection molding machine for a new project, PG&E representatives assessed the efficiency of various models to identify the most efficient 720-ton unit that could be configured for the plant. The analysis identified two options that were more efficient than the baseline constant volume hydraulic injection molding machine. These included a variable volume hydraulic injection molding machine and an electric molding machine, with the electric machine having the highest efficiency. Unfortunately, electric injection molding machines of the required capacity are not available from Injex’s vendor until 2007.



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Plastic components manufacturers rely on injection molding machines to shape plastic products. Converting from constant volume hydraulic injection molding machines to variable volume machines can save energy because variable volume molding machines are more responsive to change in the molding process's demand patterns.

Upon review, PG&E's representatives found that because variable volume units adjust the pump speed according to pressure requirements, the average electric energy use in this case was 43% lower than that of a constant volume unit. Injex therefore selected a 720-ton variable volume hydraulic injection molding machine with a high efficiency pump motor.

### PROJECT SUCCESSES AND LESSONS

Injex's addition of a variable volume injection molding machine underscores the company's commitment to energy efficiency. Not only is the new machine more efficient, it is less maintenance intensive, enabling Injex to run the production line more reliably.

In addition, the pump motor is very efficient at part-load, consuming even less energy than a standard motor does at low speeds. Because the new machine provides oil only when needed, there is less heat build-up in the oil, reducing the load on the plant's cooling towers.

With estimated annual energy savings of more than \$29,000 and 213,000 kWh, the project achieves Injex's energy savings target. These energy savings enabled Injex to earn a \$14,250 incentive from PG&E, and since project costs were \$28,500 above those of a standard efficiency 720-ton constant volume unit, the project achieved a simple payback in just under 6 months. Thanks to this project's success, Injex is replicating it with several other injection molding machines.

### EFFICIENT INJECTION MOLDING

Injection molding machines are complex industrial devices that perform a variety of tasks including melting, keeping substances at specific temperatures, locating molds, injecting melted substances into molds, controlling molds while the melted substances are injected, cooling and removing parts without causing any damage. Hydraulic systems have traditionally been the most effective type of equipment to apply the necessary forces and control occurring in industrial molding processes. More recently, variable volume hydraulic systems and electric molding machines have been developed that are 40% to 75% more efficient than constant volume injection molding machines.

**PG&E'S ENERGY MANAGEMENT SOLUTIONS** can help you control your operating expenses through building energy efficiency and demand response capabilities into your new and existing facilities, and your long-range planning. Services include energy analyses of existing facilities, design assistance for planned projects, equipment rebates, project incentives, and education and training. For more information call PG&E's Business Customer Center at (800) 468-4743 or visit [www.pge.com/business](http://www.pge.com/business)

