

Federal-Mogul

CASE
SUMMARY

9



FEDERAL-MOGUL IGNITION PRODUCTS

Burlington, Iowa
Des Moines County

Intern: Karthik Venkataraman
Major: Master's in Industrial Engineering
School: Iowa State University



The Company

Federal-Mogul is a global supplier of automotive components and subsystems serving the world's original equipment manufacturers and the aftermarket. Headquartered in Southfield, Michigan, Federal-Mogul today employs more than 45,000 people in 29 countries with annual revenues of more than \$6 billion.

The Burlington facility specializes in the manufacture of spark plugs under the brand name of Champion®. There are approximately 500 employees working three shifts a day in two plants. The average production is 500,000 spark plugs each day. The company is a TS 16949 and ISO 14001 certified facility spread over 360,000 square feet.

Project Background

The objective of this project is to reduce the energy consumption and enhance compressed air usage in the facility. These are important issues in manufacturing, primarily for environmental and economic reasons.

Lighting is a major component of electrical use in this facility, which currently uses metal halide lamps. Switching to fluorescent fixtures will save thousands of dollars over the long run. This project investigates the initial investment required and the savings that will result upon implementation. Modifications will be made, without compromising on illumination, based on lighting standards and a customized lighting profile.

Compressed air is a major expense for this facility. It is used in almost every step in the manufacture of a spark plug. This project included a feasibility study to identify areas with potential for improvement as well as estimate the costs and the benefits. As electricity is consumed in the process of generating compressed air, taking steps to improve the efficiency of the compressed air system will have a direct impact on energy bills.

Incentives to Change

Compliance with environmental standards and emission regulations is of paramount importance at Federal-Mogul. The facility is both TS 16949 and ISO 14001 certified, thus striving for continuous improvement in reducing energy use and promoting pollution prevention, which are an integral part of these certifications. The price of energy is increasing, making conservation





more important from an economical perspective. Several steps have already been taken as a part of Federal-Mogul's dedication to process improvement in the areas of waste reduction and energy consumption. The company participates in many recycling programs and continuously seeks opportunities to reduce costs, inefficiencies and wastes. Federal-Mogul also constantly pursues innovative manufacturing philosophies like lean manufacturing and Six Sigma.

Results

Federal-Mogul has 1667 high-bay metal halide fixtures, 1085 of these fitted with 360W bulbs and the remainder with 400W bulbs. The annual operating cost is about \$180,871,

which is 24.5 percent of the gross annual electricity bill. By switching to fluorescent fixtures the company can reduce this to 12 percent with a possible annual energy savings of \$109,221.

There are 5 multistage reciprocating compressors powering the operations at Federal-Mogul. On average, three units are operated at 67 percent of rated load capacity. If two were instead operated at full load, this would be sufficient to meet the demand and consume less electricity. Completing the installation of the Bay Controls is the key to achieving this reduction. The dryers, which remove moisture before delivering the air to the plant, are oversized with a combined capacity of 11200 cfm. However, the demand is about 3000 cfm, thereby more energy than needed is consumed. Variable capacity dryers will help reduce the operating costs of the existing oversized dryers. An estimated annual energy savings of \$28,560 is possible by implementing the control system and down-sizing the capacity of the dryers.

Project Summary Table

Project Focus	Annual Energy Savings (kWh)	Annual Cost Savings (\$)	Status
Plant Lighting	1,530,376	109,221	In Progress
Compressor Controls	365,540	14,621	Recommended
Air Dryer	364,000	14,560	Recommended