NYSERDA Incentives Enhance Efficiency for Motorola

A Case Study prepared by Science Applications International Corporation and the New York State Energy Research and Development Authority

Today, companies increasingly recognize that energy efficiency is a corporate asset. For Motorola, recent cost-effective, energy-efficiency improvements have led to dramatically reduced costs, and improved productivity, profitability, employee morale, and shareholder value. The comprehensive scope of this project was supported by performance-based incentives offered through NYSERDA's Standard Performance Contract Program.

A Partnership to Ensure Savings and Create Value

The Motorola plant located in Elma (Erie County) is a 203,000-square foot manufacturing facility that employs 800 New Yorkers. This facility manufactures electronic sensors and controllers for the automotive industry.

Early in its decision to explore plant improvements, Motorola opted for a partnership with an energy service company (ESCO) that would result in facility improvements while reducing energy costs through a guaranteed savings program. Through a competitive procurement process, Siemens Building Technologies, Inc. was chosen as the ESCO for a five-year, guaranteed savings contract to provide comprehensive services to the facility.

Siemens worked with Motorola engineers to develop a set of cost-effective energy efficiency measures, developed through a detailed approach that included the review of facility layout, systems operations, and the development of baseline energy consumption data and historical profiles. The project scope also required Siemens to install and commission new equipment, as well as meter and verify savings.

The Motorola plant located in Elma, New York.

"I have been in the guaranteed energy savings field for more than 20 years. I rate this program as the best of its kind with an exceptionally high quality of service by NYSERDA to facilitate participation by ESCOs.

NYSERDA's approach to build the ESCO market through incentives is very timely, and offers attractive bottom-line economic and environmental benefits that decision makers can appreciate."

– Tom Garrett, Siemens Industrial Business Development Manager

NYSERDA's Standard Performance Contract Key to Project

While the savings identified by Siemens were significant, the capital costs for improvements yielded a longer payback than was typical for Motorola's return on investment criteria. By participating in NYSERDA's Standard Performance Contract Program, Siemens was able to recover 50% of the capital costs of this project through incentives, thereby reducing the project cost to Motorola. This program is one of many commercial/ industrial energy-efficiency initiatives being offered as part of NYSERDA's **New York Energy $mart**SM Program. The performance-based incentive offered by NYSERDA's Standard Performance Contract Program helped create a viable project with a payback of less than two years. The measurement and verification of savings as required by NYSERDA's program was an added bonus to evaluate both the ESCO's contractual performance, and the customer's energy efficiency performance.

NYSERDA SPC Program

The Standard Performance Contract Program provides financial incentives paid on a performance basis for performance contracts or construction projects that include cost-effective electrical efficiency improvements. Project incentives are paid based on the measurement and verification of electric savings. The Standard Performance Contract Program is a component of the **New York Energy $mart**SM Program and is designed to help customers develop portfolios of innovative actions to cut energy costs, improve processes, reduce waste, and increase productivity, as the State's electric utilities move to competition. The **New York Energy $mart**SM Program is funded by a System Benefits Charge on the distribution of electricity throughout the State. The **New York Energy $mart**SM programs are available for customers in the service territories of Consolidated Edison, Central Hudson Gas and Electric, New York State Electric and Gas, Niagara Mohawk, and Orange and Rockland.

Efficiency Measures Implemented

The cost for the Motorola project was $893,515 including an estimated NYSERDA incentive of $446,757. With a projected annual cost savings of $245,268, and energy savings of 6,507,543 kWh per year, the project is anticipated to pay for itself in under two years and yield an Internal Rate of Return (IRR) of over 35%. The energy-efficiency measures included installing a facility-wide energy management system (EMS) to accomplish these goals:

- Control Environmental Systems – Siemens installed an EMS to control roof-top air-conditioning units, variable air volume units, heaters, and fans. Control strategies include demand limiting on the roof-top units, night setback for each variable air volume box, and roof-top supply-air reset based on actual space temperature requirements.

- Optimize Air Compressor/ Desiccant System – To lower the pressure call set point and to minimize compressor run time, the entire system was interfaced with the SIEMENS EMS to run based on field load while monitoring dew point to provide better moisture control; in addition, an optimal start/stop, load/unload sequence was programmed for each unit.

- Install Chilled Water Reset – Connecting the chiller to the EMS optimized the cooling process by automatically resetting temperature and supervising the system operation.

- Establish Time-of-Day Scheduling for Ancillary Items – The EMS was further tied into various building systems

such as low-voltage lighting circuits, heaters, pumps, and compressors to control their operation based upon programmed operating schedules and occupancy.

- Install Energy-Efficient Humidification System – An electric-resistance-based humidification system capable of delivering about half of the required capacity was replaced with a novel fog system. The system forces high-pressure water through special stainless steel nozzles that atomize the water into super-fine fog droplets that evaporate quickly into the air. In addition to dramatically reducing electric consumption, this system is anticipated to lower maintenance costs and water usage.

The Benefits of Partnership

The high level of collaboration and team effort displayed by Motorola, Siemens, and NYSERDA resulted in a project with very positive impacts for all parties as well as the community. These impacts include:

- A dramatic reduction in electrical and operating costs to be confirmed through a measurement and verification process.
- The redirection of savings into efforts to increase plant competitiveness.
- Reduced risks in achieving energy savings due to the measurement and verification process and savings guarantee.
- Improved control of the facility by allowing for short- and long-term management decisions based upon real-time operating information.
- The smooth transition from accounting on a square footage basis to activity based accounting.
- The ability to access performance-based energy and cost savings information by management from any networked computer in the plant.

Other Initiatives

In addition to its energy-efficiency efforts, Motorola constantly strives to implement safer and better environmental practices and is ISO 14001 registered. The energy efficiency provided through the performance contracting efforts are in full support of and an integral part of Motorola's ISO 14001 objectives since a reduction in energy use directly translates to reduced power plants emissions. The improvements made to the facility in Elma are successfully reducing its emissions while Motorola also continues a comprehensive paper, plastics, and metal recycling program.

Future Direction

The great success of this project led to several new projects at Motorola. These include lighting retrofits and the examination of industrial process improvements such as high efficiency motors, variable-speed drives, controllers or new manufacturing technologies.

As for Siemens, the NYSERDA SPC Program has motivated an aggressive

Project Results

- **$245,268/yr estimated energy cost savings**
- **Approximately $450,000 SPC incentive**
- **Estimated 35% internal rate of return**
- **6.51 million kWh/yr estimated energy savings**
- **Improved facility operation and control based on real-time operating information**

Roof-top air-conditioning units at the Elma facility.

marketing strategy of performance-based contracts to the commercial and industrial sectors. Siemens has successfully obtained several new contracts as a result, and will continue to market performance contracting to its present and expanding customer base.

For More Information

For more information on how your firm can save energy, improve profitability and help protect the environment, contact:

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SPC Project Highlights

Business Name and Location:	Motorola; Elma, NY
Business Type:	Manufacturer of automotive electronics
Employees:	800 in New York
Project Implementation Cost:	$893,515
NYSERDA SPC Incentive:	$446,757
Estimated Annual Energy Cost Savings:	$245,268
Simple Payback:	1.8 years

Annual Energy and Cost Savings

Energy Efficiency Measure	Electric Savings	Cost Savings
Control of the Environmental Systems	3,061,246 kWh	$110,717
Optimization of Compressor/Desiccant	1,089,160 kWh	$38,747
Chilled Water Reset	92,061 kWh	$2,762
Time-of-Day Scheduling for Ancillary Items	530,596 kWh	$20,859
Energy-Efficient Humidification System	1,734,480 kWh	$72,183
Totals	**6,507,543 kWh**	**$245,268**

"In today's manufacturing environment, finding ways to improve efficiency are necessary to remain competitive.

Partnering with Siemens and NYSERDA proved to be an economical way of reducing our energy costs. Projects of this nature need a strong and competent management crew that will be partners for the long haul.

Throughout the project, production remained on schedule thanks to the teamwork and collaboration of Siemens and Motorola personnel. Furthermore, NYSERDA's staff facilitated the smooth progression of the project through all the administrative phases of the SPC program."

– Mark Casell, Motorola Facility Systems Engineer

For further information about **New York Energy $mart**℠ programs, contact NYSERDA's Communications Department at: (518) 862-1090, ext. 3250; or visit our website: www.nyserda.org

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