



Case Study: ON Semiconductor, Inc. 2009

Project Date:

April through October 2009

Project Conducted By:

ON Semiconductor, Inc., TechHelp, Idaho Department of Environmental Quality, Pacific Northwest Pollution Prevention Resource Center (PPRC), Idaho Office of Energy Resources

Case Study Prepared By:

ON Semiconductor, Pocatello, Idaho

Introduction

ON Semiconductor Inc. (ON) in Pocatello, Idaho, designs and manufactures semiconductors for use in the automotive, medical, aerospace, military, and consumer markets. The Pacific Northwest Pollution Prevention Resource Center (PPRC), Idaho Department of Environmental Quality (DEQ) and Idaho's Manufacturing Extension Partnership (TechHelp), partnered in a lean and environment pilot project with ON in 2009. Funding for the project was provided by the EPA and the Idaho Workforce Development Training Fund, with additional in-kind hours contributed by ON, Idaho DEQ, TechHelp, and PPRC.

The primary objectives of this collaboration were to:

- Evaluate the benefits and synergies of integrating environmental considerations into lean practices.
- Improve environmental sustainability and efficiency at ON.

Prior to the event, ON had addressed many issues using lean manufacturing principles and implemented environmentally sustainable projects/programs. ON felt additional improvements were possible by considering both lean and environmental aspects.

This evaluation focused on services provided by the Facilities department, including process gas distribution, chemical distribution, electricity distribution, water distribution, facilities maintenance, grounds keeping, and custodial services.

On April 7th and 8th, TechHelp lead ON employees through a value stream mapping (VSM) event of Facilities Services while Idaho DEQ and PPRC provided environmental input to the VSM process. The Lean Green team ensured that the current state and future VSM preparation was expanded beyond conventional lean to incorporate material, energy, and water inputs and outputs at each "process box".

Collectively, the participants closely scrutinized the current state and identified potential lean and environmental improvements. From April to October 2009, numerous lean green improvements were implemented. Several projects with large scopes are in the process of being implemented.

Findings

The Lean Green Team spent two days evaluating the current state of services provided by the Facilities group and subsequently created future state goals. To include and better identify environmental improvements, any relevant material, water, energy, and waste inputs and outputs were captured on the VSM.

Over 70 ideas were generated during the VSM. Some of the opportunity areas identified include:

- Divert recyclable material from landfill to local organizations for reuse and to local recyclers.
- Create a Green Team to have ongoing company-wide ownership of green projects.
- Improve and standardize spray paint techniques to optimize transfer efficiency and reduce overspray.
- Consolidate buildings and like processes.
- Reduce energy consumption.
- Reduce landscaping water use.
- Reduce maintenance and repair costs associated with grounds maintenance.

Activities and Outcomes

Over the course of several months, ON, TechHelp, Idaho DEQ, and PPRC corresponded regarding the environmental opportunities identified above. TechHelp returned to train ON Facilities employees in planning and conducting a Kaizen event. ON then carried out a Kaizen event, focusing on consolidating parking lots to minimize maintenance and repair costs, and reduce consumption of fossil fuels required for these activities. In addition, ON developed a Green Team to address sustainability projects using grassroots efforts. A list of planned actions and associated annual cost savings associated with the Lean Green VSM and the Kaizen event are listed in Table 1 below.

TechHelp also facilitated an engineering analysis of potential beneficial uses for ON's current wastewater stream, conducted by Idaho State University College of Engineering Senior Design Team.

Additional opportunities identified from the VSM and Kaizen event that may be considered for future implementation are presented in Table 2.

TABLE 1 – Opportunities Evaluated, and Implemented

Action	Result
<p>Implemented Blue Bootie Recycling: provided to area realtors and builders associations for reuse at open houses and Parade of Homes</p>	<p>Avoided disposal of 800 pairs of booties per month.</p> <div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;">Booties being collected at ON</p> <p style="text-align: center;">Booties being used at the Pocatello Parade of Homes</p>
<p>Implemented plastic bottle, aluminum can, newspaper, and magazine recycling</p>	<p>Recyclables are now collected and the on-site collection is managed by Green Team members in order to prevent an increase in workload for custodial services</p> 
<p>Revegetate south lawn with native plants, create walking trail, and raised beds for employees to grow organic vegetables or plants (<i>in planning stage</i>)</p>	<p>Save 4.9 million gallons of water annually. Promote employee health and well being. Save \$18,000 annually by reducing water use and maintenance.</p>
<p>Telethon to cancel publications sent to former employees (<i>in planning stages</i>)</p>	<p>Reduce 300 pounds of paper per month by stopping this publication at the source.</p>
<p>Eliminate redundant lab refrigerators</p>	<p>Discontinued using one refrigerator by consolidating materials, saving energy.</p>
<p>Turn off lab incubators when not in use.</p>	<p>Reduced incubator energy consumption by 70%</p>
<p>Consolidate office space and duplicate services (<i>in process</i>)</p>	<p>Save 3.4 million gallons of water annually (~\$5,000) Save 12,000 Therms of natural gas annually (~\$12,000) Save \$32,000 annually in electricity Save \$400,000 annually in rent and other costs</p>
<p>Negotiate with City on wastewater pH limit</p>	<p>Decreased ammonia consumption Decreased wastewater ammonia surcharge fees--\$6,000 annually</p>
<p>Annual Cost Savings (For Items Quantified)</p>	<p><u>\$473,000</u></p>

TABLE 2 – Potential Future Opportunities

Action	Potential Outcome or Result
Find and implement the best beneficial reuse opportunity for wastewater (prepared by Idaho State University)	Cost savings of over \$200,000 per year (after payback). Reduced wastewater generation.
Evaluate beneficial end use for calcium fluoride cake waste stream (non-hazardous)	Disposal cost savings, beneficial reuse.
Recycle nitrile gloves	Disposal cost savings.
Search for a local, beneficial reuse for waste acids	Disposal cost savings, beneficial reuse.
Determine if waste solvents have significant Btu value to sell as fuel	Disposal cost savings, beneficial reuse.
Unplug and turn off electronics when not needed (e.g., cell and battery chargers, computers, etc.)	Energy savings.
Evaluate water cooler use and reduction	Energy savings.
Automatic controls on thermostats	Energy savings.
Rightsize the nitrogen gas production system	Energy savings and reduced overproduction of nitrogen gas.
Additional facility consolidation, especially one facility only used and maintained for records storage	Energy and maintenance savings.

Acknowledgements

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For information on other lean and environment projects, or inquiries about PPRC assistance with lean and environment efforts at a facility, contact Michelle Gaither at mgaither (at) pprc.org or visit <http://pprc.org/solutions/leangreen.cfm>.