

Achieving Pollution Prevention Success: Painting and Coating Processes Economy, Energy, and Environment Project

Grantee: Minnesota Pollution Control Agency

Title: Painting and Coating Processes Economy, Energy, and Environment Project

EPA Funding: \$75,000

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Project Description

Partially funded by a U.S. Environmental Protection Agency (EPA) Pollution Prevention (P2) grant, the Minnesota Pollution Control Agency, in partnership with the Minnesota Technical Assistance Program (MnTAP) at the University of Minnesota, and “LEAN” assistance providers, conducted an Economy, Energy, and Environment (E3) pilot to provide direct technical assistance on painting and coating processes used in manufacturing. The goal of the project was to achieve natural resource (water and materials) reductions, time, motion and energy efficiencies, and cost savings at Minnesota manufacturing facilities. In addition to working with manufacturers engaged in painting and coating processes, the grantee also worked with the manufacturers’ supply chains. E3 assessments that focused on environmental, energy efficiency and LEAN improvements were provided at three facilities. The grantee and project partners also provided follow up support to the companies participating in the pilot to encourage implementation of the E3 assessment recommendations and measure the environmental and economic benefits the facilities’ achieved as a result of the implementation.

Reason for Focus on the Painting and Coating Processes

Painting and coating processes can result in significant emissions of Volatile Organic Compounds (VOCs) into the environment. The reduction of these compounds were the focus of this project. VOCs are a large group of carbon-based chemicals that easily evaporate. Most common liquids that evaporate and have an odor are comprised of VOCs. When VOCs are released into the atmosphere, they are chemically transformed into ground-level ozone which is a component of smog and is a harmful air pollutant. VOCs are emitted from many industrial and commercial processes, including those that use coatings, inks, solvents, adhesives, or other chemicals. VOCs are found in many products and materials and are released through manufacture and use.

Project Approach

This project focused on painting and coating processes used in manufacturing to:

1) identify painting and coating supply chain-connected companies within the state of Minnesota; 2) conduct outreach to manufacturers employing painting and coating processes and their supply chain-connected companies and form a group of three E3 pilot participants; 3) conduct three environmental and energy components of E3 assessments; and, 4) conduct three LEAN components of E3 assessments.

Educational Materials

MnTAP prepared and developed a banner, logo, and design format to provide a consistent overall "look and feel" to all communications and create a cohesive program. An E3 in Painting project page on MnTAP website http://www.mntap.umn.edu/industries/air/industrial_painting.html was created including an online application to participate in the project. A short article publicizing the project was provided for use in partner newsletters, with links to the MnTAP E3 in Painting website. Promotional articles were also sent in MPCA’s Air Mail and Small Business Enterprise Newsletters as well as MnTAP’s E-news and Source Newsletter.

Lessons Learned and Results

An intern was placed at the first facility to support the implementation of E3 assessment recommendations and facility water optimization that reduced water use in cleaning by 9,000,000 gallons per year and 28.5 tons of water softening salt (saving \$86,400). As a result of LEAN training of facility staff, the facility standardized tools at each paint line, which simplified production and repurposed tools and equipment for spare parts, saving \$2000 in parts and tool inventory.

The E3 assessments recommendations made at the second facility resulted in 60,000 pounds of wood waste not being sent to landfill, but instead being used locally for heating, which saved the facility \$4000. The facility also approved the switch to low temperature curable powder coatings, which will result in production throughput increases estimated to save \$25,500 in labor and 10% in fuel costs on the oven, associated with a fuel reduction of 2400 therms / yr. LEAN recommendations implementation resulted in increased production throughput from 12 to 18 units, use of new Standard Operating Procedures, and improved product staging and operating procedures which reduced part transportation waste.

The E3 assessment recommendations at the third facility resulted in partial implementation of improved painting operation procedures, including improved production scheduling, and inventory management practices. At the end of the grant reporting period, the facility had implemented approximately 50% of these procedures. When these practices are fully implemented, the improvements in throughput are estimated to correspond to a \$270,000 in increased profitability.

In summary, at the end of the grant reporting period, the implementation of recommendations from the three E3 assessments resulted in 57,000 pounds of hazardous materials reduced, 9,000,000 gallons of water conserved, 61.3 metric tons of carbon dioxide equivalent emissions reduced and costs savings of \$262,400.

ⁱ Pollution Prevention involves the reduction or elimination of pollution at the source by modifying production processes, using less toxic substances, implementing resource conservation techniques, conserving water and energy, and reducing greenhouse gases. Energy and water conservation, hazardous materials and greenhouse gas reductions, and cost savings are all benefits of a P2 approach. EPA provides grant assistance to states and tribes to help businesses identify and implement P2 practices.