

**Illinois Governor's Sustainability Awards
Hosted by the Illinois Sustainable Technology Center
Sample of a Winning Narrative**

This sample of a winning narrative is intended to give applicants an overview of what should be included in the award application. This sample is not a guaranteed winner. Your entry is based on what you have accomplished and included in the application.

Please contact us if you have questions about your application.

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Sample Application Narrative For Company X:

Who we are:

Company X is a leading manufacturer of additive products designed to enhance the performance of lubricants. Our plant produces a wide variety of detergents, dispersants, corrosion inhibitors and anti-wear products that are packaged according to customer specifications. The company markets its products to oil companies and lubricant manufacturers. These companies formulate the additives with base oil to produce common consumer products such as motor oil, automatic transmission fluid and gear oil. The company operates nine 'batch' process units at the Illinois site. While each process unit produces different products, all units operate basically the same: raw materials and catalyst are added to a reactor vessel where the materials are heated and stirred for a period of time. Once the batch is complete, a separation step is usually required to remove the water or solvent byproduct from the finished product. This is accomplished by performing a 'phase cut' and/or applying heat or vacuum to remove the excess byproduct material from the product. The byproducts are recovered and are either reused in a subsequent batch, sold, or disposed. In most cases the finished additive product is filtered and then sent to final storage. Figure X illustrates a typical petroleum additive manufacturing process. Each project presented below was initiated with the last 12-24 months and has greatly contributed to waste reduction, improve process operability, and improved cost of manufacturing. For this reason, these projects were selected for inclusion in this application for the Governor's Sustainability Awards.

Primary Criteria

1. Description of Projects, Programs or Technologies

Product Filtration Improvement Project—the company produces numerous products that require filtering prior to packaging or storage. Crude additive products are typically filtered through large "pressure leaf" filters that are pre-coated with a diatomaceous earth filter media (see Figure X). Once a batch of crude product is successfully filtered, common operating procedure calls for "back-blowing" the filter vessel with nitrogen. This practice dries the diatomaceous earth filter media while recovering valuable product

back into the crude product feed tank. The filter is opened and the waste diatomaceous earth filter media is dropped through a chute a large waste bin (see Figure X). The waste bin or “lugger” box is subsequently shipped to the local sanitary landfill for disposal. Despite best efforts to backblow and recover valuable product from the filters, some product remains entrained in the waste filter cake. As much as one pound of product per one pound of filter aid can be lost in this process (see Figure X).

In late 2007, a filter operator began to experiment with filter operating procedures, looking for ways to recover more usable product from the waste cake. By *slightly* opening an additional valve on the filter vessel during the back-blowing stage of the process, the operator was able to recover an additional 50-100 gallons per batch of finished product (see Figure X). This individual’s effort annually saves 3 railcars (60,000 gallons) of valuable product that would have otherwise been lost with the waste filter media (see Figure X).

“No Blow” ABSA Project—the company produces alkylbenzene sulfonic acid (ABSA), an intermediate component used in the production of motor oil detergents. During the ABSA production process, small amounts of sulfur dioxide (SO₂) gas become entrained in the product, later causing filtration problems in the final product. Because of this, standard operating procedures called for removing the SO₂ gas from the ABSA liquid by sparging the tank with nitrogen. The sulfur dioxide released from the product was removed from the storage vessel using a draft blower and vented to the atmosphere (See Figure X).

In early 2007, a multifunctional team composed of chemists, engineers, operations and maintenance personnel reevaluated the effect of the entrained SO₂ in the current ABSA intermediate on finished product filtration rates. Through years of process improvements, the team determined that low levels of SO₂ in the intermediate ABSA product could be tolerated without adversely affecting final product filterability. The practice of blowing the ABSA receiver tank was discontinued in February of 2007. By changing operating practices, approximately 63 tons/year of SO₂, point source air emissions were eliminated. This is significant because SO₂ emissions are an air quality attainment concern for the immediate area. Also important are the associated process efficiency improvements that were realized by eliminating this blowing procedure. Process on-stream time increase three percent and SO₂ blower maintenance was eliminated entirely. The maintenance cost savings is estimated at \$24,000 annually.

Odor Reduction from Alcohol Condensate Project—the company uses alcohol as raw material to produce its anti-wear additive products. Alcohol is fed from a storage tank to the reactor, where it reacts to form an intermediate product. Alcohol is fed to this process in excess to ensure complete conversion of other raw materials and to ensure that a good quality intermediate product is produced. The unreacted alcohol left at the end of this process is removed from the reactor by vacuum distillation and condensed. The material is eventually discharged, under permit, to the local Publicly Owned Treatment Works (see Figure X). The alcohols used in this process have a strong and distinct odor. Starting in late 2007 and continuing through 2008, a multifunctional team consisting of chemists,

engineers, operations and maintenance personnel studies the production process for ways to reduce internal odors from the usage and handling of the alcohols. Two notable improvements to the process were made. First, the team reduced the initial charge of excess alcohol to the reactor vessel.

Secondly, equipment modifications were made that allowed operations to better control the quantity and rate at which waste alcohol condensate discharged to the sewer system. These changes reduced alcohol raw material waste and greatly reduced alcohol odors. An unexpected benefit of improved product filterability was also realized as a result of this process change.

Fluorescent Lamp Replacement Program—Many of the fluorescent lamps in use today contain mercury. Because of this, spent bulbs must be sent to licensed hazardous waste recycling or disposal facilities. In late 2006, the company initiated a program where the older style mercury-containing lamps were changed out in favor of newer, low-mercury, “green” lamps. The old lamps were collected in drums and sent to a licensed recycling facility. Initially, 30 percent of the old style mercury-containing lamps were changed out to the environmentally friendly “green” bulbs. The company continues to change mercury-containing bulbs, as needed, and sends all tubes to a licensed recycling facility. Eventually, all hazardous waste light tubes will be eliminated. Since inception of this project, the plant has installed approximately 1200 “green” bulbs, which represents about 60 percent of the total light tubes found on the plant site.

Styrene Safety Stock Elimination Project—Styrene monomer is a raw material used to manufacture one of the company’s pour point depressant additive products. Styrene is charged directly to the reactor vessel from 55-gallon drums. Historically, the company has maintained a “safety stock” of styrene drums in its warehouse to meet the erratic production demands for this specialty product. Styrene monomer has a short shelf life and can easily polymerize or solidify while in storage. Between 2007 and 2008, 38 drums of styrene safety stock polymerized while in storage. The material was disposed of as RCRA hazardous waste at a licensed treatment, storage and disposal facility (TSDF). The inventory loss and disposal cost totaled \$22,500. In early 2007, a new inventory and accounting computer system was installed which allowed our operations and warehouse personnel to review the usage and better forecast demand for styrene raw material. The safety stock of styrene was reduced from 20 to 5 drums in early 2006 and later reduced from five to zero drums in late 2006. The company no longer carries safety stock of styrene in its warehouse; therefore, waste is eliminated at the source. The company’s logistics department also worked with a local distributor of styrene monomer to supply this raw material in a just-in-time fashion to meet our production needs.

2. Waste Volume/Toxicity Reduction

Product Filtration Improvement Project—This source reduction project recovers an additional 60,000 gallons per year of product (equivalent of 3 railcars) which translates to an annual reduction of waste to the landfill of 500,000 pounds.

“No Blow” ABSA Project—By ceasing the nitrogen sparge of the ABSA receiver tank, the company eliminated 63 tons per year of SO₂ emissions to the atmosphere.

Odor Reduction from Alcohol Condensate Project—Reducing the amount of excess alcohol charged to the reactor eliminated 288,000 pounds per year of waste alcohol to the sewer. We also realized a multimedia effect of reduced air emissions.

Fluorescent Lamp Replacement Program—By changing to the less toxic, low-mercury, bulbs the plant has eliminated roughly 60 percent of its RCRA hazardous fluorescent tubes. Eventually, all bulbs will be replaced with non-hazardous variety, totally eliminating this hazardous waste stream.

Styrene Safety Stock Elimination Project—Prior to implementation of this project, the plant disposed of approximately 13 drums (5,850 pounds) per year of polymerized styrene at RCRA D001 ignitable hazardous waste. This waste has since been eliminated as a result of this project. Also, refer to Figure X: Collective Impact of 2008 Plant Sustainability Projects, attached.

Secondary Criteria

3. Management Commitment

The plant's mission is to "provide consistent quality products and service to our customers, community, and suppliers in all phases of the operation." Management strives to fulfill this mission by supporting these sustainable projects, programs, and technologies that, together, reduce waste while improving process operability, safety, product quality and cost. Management recognizes that sustainability is good business and is an integral part of the daily plant operations.

Management's support of sustainability is also outlined in the attached *Sustainability Policy* (see Figure X). As a corporation, we are an active member of the Chemical Manufacturers Association (CMA) and are committed to the management practices of CMA's *Responsible Care* program. The *Sustainability Code* (see Figure X) is one of the six key elements of the *Responsible Care* program. Commitment to these "Codes of Management Practice" is a condition of membership in CMA.

Each year, management sets plant goals in the areas of operations, quality, transportation, safety, and environmental. Plant environmental goals include projects that are selected from the plant's sustainability assessment of emitting sources. Potential projects are ranked in order of priority and plant goals are set for achieving waste and cost reductions.

4. Employee Participation

Employee involvement and participation in the sustainability process is accomplished primarily through the company's *Quality Improvement Process* program. QIP emphasizes "total quality" and utilizes a team approach as a means to improve plant processes.

In addition to QIP, the company also uses *Multifunctional Teams (MFTs)* and the *Environmental Priorities Team* as a way to involve its employees in the quality improvement process. MFTs are responsible for identifying opportunities in their areas of responsibility, establishing project priorities and timing, and implementing the project. The Environmental Priorities Team is responsible for tracking progress on the annual

sustainability goals established by management and setting the direction of many longer term environmental projects.

The company builds awareness among its employees by conducting annual sustainability training. This training highlights recent accomplishments, such as the projects presented in this application, the cost/benefits effects, and future plans to reduce pollution. The results of the annual assessment are also presented to build employee awareness of high volume/high cost waste streams.

Finally, the company presents quarterly team awards to the MFTs that demonstrate outstanding performance in the area of process improvements, cost savings, safety, quality and pollution prevention. A reception is held where the winning team is recognized among peers for its accomplishments. The winning team or individual is also recognized in the employee newsletter. Attached are articles from this newsletter recognizing those employees involved in the Product Filter Improvement Project (see Figure X), the No Blow ABSA Project (Figure X), and the Odor Reduction from Alcohol Condensate Project (Figure X).

5. Economic Benefits

Product Filtration Improvement Project—The annual economic benefit to the company is a savings of over \$250,000 worth of valuable product that would have otherwise been disposed.

“No Blow” ABSA Project—Approximately \$24,000 per year of equipment maintenance cost was eliminated as a result of this project. Also the process unit realized a three percent increase in on-stream time due to this decreased equipment maintenance.

Odor Reduction from Alcohol Condensate Project—An annual raw material saving of \$147,000 was realized by this project.

Fluorescent Lamp Replacement Program—This project has a net zero economic benefit. The value of this project is realized from reduced toxicity of the mercury lamps sent for offsite disposal.

Styrene Safety Stock Elimination Project—This project eliminated styrene “shelf life” loss, saving the company an estimated \$7,700 per year in raw material and disposal costs.

6. Benefits to Workers, Community or Environment

All of the above listed projects had positive impacts on workers, the community and the environment. The *Product Filtration Improvement Project* reduced the volume and toxicity of the material being sent to the local landfill for disposal. *The No-blow ABSA Project* had a direct impact on workers, community and the environment by reducing SO₂ air emissions by 63 tons per year. The *Odor Reduction from Alcohol Condensate Project* also had a direct impact on workers, neighboring businesses and the surrounding community by reducing odors from the process. The remaining projects benefit workers,

community and environment by reducing or eliminating, at the source, the volume and toxicity of wastes generated by the process.

7. Relevance to Others

Our success and experience in reducing waste is often shared with others—both internal and external to the company. Due to similarities among the company's process units, a success in one area can often be applied to other processes in the plant. A waste reduction method or technique, such as that outlined in the *Product Filter Improvement Project*, above, may find similar application in one of the plant's ten other process filters. The company continues to involve its suppliers and customers in its sustainability efforts. *The Styrene Safety Stock Elimination Project* was a cooperative effort between the company and our raw material supplier to eliminate plant waste, while at the same time, maintaining the required safety stock to support production needs. The company shares this expertise with the community through participation on the county P2 advisory board. This advisory group consists of local industry representatives that meet regularly with representatives from the county health department to share experiences and to help facilitate awareness in the community. Figure X is an excerpt from a company presentation given to this advisory group in the fall of 2008.

8. Compliance Information

Our company is not subject to an environmental enforcement action or notice of violation from the Illinois EPA or US EPA.