Dulin Metals Co., located in Des Plaines, IL, reclaims nonferrous metal scrap. They de-oil and de-tin the scrap, making a high-quality product for resale. Dulin is one of only two de-tinning operations in the United States and is part of the Versatile Processing Group. Other Versatile Group companies recover metal from wire, cable, and decommissioned transformers. Dulin also accepts these materials and separates wire and cable metal types prior to sending them to another facility for metals recovery.

SITUATION
Dulin Metals is firmly committed to good business practices which benefit people, planet and profit. They had several goals for the E3 assessment: (1) identify opportunities that would allow them to no longer be classified as a large quantity hazardous waste generator; (2) find ways to reduce utility costs; and (3) repurpose waste in a more efficient, cost effective and sustainable manner. Dulin Metals utilized Illinois Sustainable Technology Center’s (ISTC) technical assistance to facilitate a team based E3 (Economy, Energy, and Environment) assessment.

THE E3 PROCESS
This E3 program, developed in part by the U.S. Environmental Protection Agency and the U.S. Department of Energy, is designed to improve production and profitability while reducing energy usage and environmental impact. The E3 review involves a hands-on assessment of production processes, recommendations for improvement, and assistance with implementation.

Three Illinois organizations teamed up to provide this assistance to Dulin. ComEd, a subsidiary of Exelon Corporation, provided recommendations on energy improvements. ISTC focused on environmental performance. The Illinois Manufacturing Excellence Center (IMEC) provided economic and process efficiency advice. The E3 assessment team reviewed the entire facility.

Dulin Metals showed its commitment to the E3 process by involving top management, engineers, and floor supervisors in assisting the E3 team and providing data and information about product flows, material usage, processing time, and energy usage. Following the assessment, the team reviewed its recommendations with Dulin decision-makers and produced a final list of specific action areas in each of the three focus areas.

Please contact ISTC for more information: istc-info@illinois.edu
TOTAL E3 RECOMMENDATIONS

Here is the full list of potential improvements at Dulin, identified through the E3 process:

**Energy Use**
- Lighting retrofits
- Air compressor efficiency
- HVAC optimization
- Process heating improvements

**Hazardous Waste Reduction**
- Evaporation/ultrafiltration of solutions

**Lean Manufacturing**
- Workplace organization
- Operating procedures and cross-training

**Waste Recovery**
- Corn cob waste to fuel pellets

### ABOUT THE E3 PROJECT

The Regional ISTC/IMEC Waste to Profit E3 Project was funded by the U.S. Environmental Protection Agency and supported by The County of DuPage, Illinois and ComEd, a subsidiary of Exelon Corporation.

Find out more at: [www.e3.gov](http://www.e3.gov)

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### DULIN METALS CO.

#### ENERGY

**HVAC & Lighting Optimization** - Dulin made efficiency improvements which included installing a programmable thermostat to control heating and cooling, and installing occupancy sensors.

*Annual Savings*: 49,595 kWh / 12,455 therms / $11,364

**Compressed Air** - Dulin replaced open tube air guns with OSHA-compliant, energy-efficient safety air guns.

*Annual Savings*: 5,720 kWh / $500

### WASTE RECOVERY

Dulin Metals uses dry corn cob grit in its processes, generating about 960 tons of waste corn cobs annually. Some of the waste corn cob grit is contaminated with oil (de-oiling cob) and the rest with moisture (de-tinning cob). The de-tinning cob has comparatively higher metals content than de-oiling cob. All of the waste corn cob material was going to landfill until ISTC identified a company that can pelletize and turn the material into a source of alternative energy.

ISTC provided research and testing on waste corn cob samples to determine the metal content, if any, that would be found in by-products of pyrolysis. The results showed that corn cob pellets would be a clean source of energy, providing an average 8,000 BTU per pound of material. There will be considerable cost savings and a huge quantity of waste will be diverted from landfill when Dulin puts this waste recovery solution into place.

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**Corn cob samples tested at ISTC labs**

- Clean corn cob grit
- De-oiling corn cob
- De-tinning corn cob

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"With the help of the expert team involved in this project, we were able to take a quantitative and qualitative look at our processes, and improve upon them."

- Bret Penninger, Plant Manager

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[istc.illinois.edu](http://istc.illinois.edu)