GKN Land Systems, located in Woodridge, IL, manufactures agricultural drive shafts and clutches for agricultural applications as well as for military and marine vehicles.

GKN is firmly committed to good business practices which benefit the triple bottom line: people, planet, and profit. Their main goal for the E3 assessment was to identify opportunities for improvement in efficiency and energy use. GKN utilized Illinois Sustainable Technology Center’s (ISTC) technical assistance staff to facilitate a team-based E3 (Economy, Energy, and Environment) assessment.

SITUATION

The E3 assessment reviewed the three value streams (agricultural, marine, and military) on the shop floor with particular focus on the agricultural drive shafts value stream. The total facility is about 140,000 ft² and the shop floor has an area of approximately 60,000 ft². The supply chain is quite complex as there are a large number of suppliers located around the world. Many of the larger suppliers are other GKN companies in Europe. The parts and assemblies GKN produces are essentially made-to-order due to varying customer specifications and volumes – this is characterized as a “high mix/low volume” environment. GKN is also under pressure from customers to reduce lead times.

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. Three Illinois organizations teamed up to provide this assistance to GKN. 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 review involves hands-on assessment of production processes, recommendations for improvement, and assistance with implementation.

GKN Land Systems involved top management, engineers, and floor supervisors in the E3 process. These individuals assisted the E3 team and provided information about product flows, material usage, processing time, and energy usage. Following their assessment, the team reviewed its recommendations and produced a final list of specific action areas in each of the three focus areas.

This E3 Success Story is part of a series of case studies, produced by ISTC, exploring environmental and business improvements which are repeatable at other facilities and organizations.

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

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

### Energy Use
- Lighting retrofits
- Air compressor efficiency
- HVAC optimization
- Occupancy sensors

### Lean Manufacturing
- Evaluate the total cost of ownership and risk management in the supply chain
- Improve supply of parts to the shop floor and material flow from machining through assembly
- Use data from missed shipments and missing parts to drive continuous improvement activities

## 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 unit of Exelon Corporation.

Find out more at: www.e3.gov

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## GKN LAND SYSTEMS

### ENERGY

#### HVAC & Lighting Optimization
- GKN made efficiency improvements which included installing destratification fans to control heating and retrofitting lighting.

**Annual Savings:** 36,988 kWh / 291 Therms / $2,449

#### Compressed Air
- GKN lowered system air pressure and reduced air leaks.

**Annual Savings:** 51,205 kWh / $2,980

### WATER AND WASTE REDUCTION

- GKN installed aeration devices on sink faucets and dual flush valves on toilets to control and reduce water flow. They installed hand dryers replacing folded towels and paper rolls in the rest rooms, eliminating waste paper going to landfill and cutting costs.

**Annual Savings:** 303,732 gallons water / $5,264

**Annual Savings:** 4,656 pounds paper from landfill / $11,827

### PRODUCTIVITY AND COST SAVINGS

GKN developed detailed Value Stream Mapping (VSM) to drive improvement in their productivity. VSM is a process of charting and redesigning that depicts the movement of inventory, products, and information. This process allowed GKN to minimize waste throughout the production process.

The estimated annual cost savings will be:

- **Inventory:** $50,000
- **Labor:** $75,000
- **Materials:** $30,000

### "The E3 process resulted in operational improvements and cost savings. GKN has saved resources and could retain four jobs since engaging in the E3 program."

- Scott Caskey, Manufacturing Engineering Manager

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