

## 2011 Case Study

# Gates Corporation

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Major: Chemical Engineering  
School: Kansas State University

Iola, Kansas



### *Company background*

Gates Corporation located in Iola, Kansas, is part of an international company that is celebrating its centennial birthday. The Iola plant employs more than 760 workers and runs 24 hours a day, seven days a week. The plant produces hose, puts on couplings, and also serves as the distribution center for the American plants.

### *Project background*

The internship consisted of water, energy, and waste reduction as well as researching a replacement for toluene, a hazardous chemical, being used in several places in the plant. Water conservation projects included installing aerators and low-flow toilets in the restrooms, as well as putting a timer on a hydraulic press to stop leaking when the machine did not need to be running. The same timer also reduced the amount of energy the press used a day. Other energy savings came from using belt-driven fans to cool workers, an air audit, and motion-sensor lighting projects. Finally the waste reduction came from installing hand dryers and adopting a wooden pallet recovery and refurbishing plan.

### *Incentives to change*

Gates Corporation chose to partake in the intern program because they saw it as an opportunity for a fresh set of eyes to see new projects, things the company may have overlooked. The company sees it as a beneficial experience for both the company and the intern; they can learn from the intern, and the intern can learn from Gates.

### *Projects reviewed for E2/P2 potential*

#### 1. Aerators

Through a restroom survey taken, it was found that employees at Gates use the restroom 2,420 times a day. Based on how many times a day an employee used the restroom, as well as the time he or she spends washing their hands, the sinks at Gates run 4,208 minutes a day. By installing aerators on the

sinks that could have an aerator attachment, Gates will save 947,815 gallons of water and \$4,701 of cost savings annually. Cost of the aerators is \$42.24.

#### 2. Low flow toilets

As mentioned previously, the restrooms are used 2,420 times a day. Currently Gates has 4.0-gallon-per-flush toilets and 1.5-gallon-per-flush urinals. Due to employee concerns about low -low toilets, the intern is recommending the Yorkville toilet by American Standard which has a 1.6-gallon-per-flush with pressure assist. American Standard also has a 0.5-gallon-per-flush urinal that is being recommended. By implementing this project Gates could save 1,177,114 gallons of water and \$5,837.98 each year. Cost of the toilets, urinals, and labor to install them is \$14,693.

#### 3. Hump-hose hydraulic press

Gates uses a hydraulic press to create hose with a hump. The press is more than 80 years old and has many leaks. Maintenance is not able to keep up fixing the new leaks that appear, and currently the press leaks 5.48 gallons a minute while the pump is running. A timer was put on the press to turn the pump off after every shot to conserve water and electricity. By installing the timer, Gates is saving 320,550 gallons of water, 14,625 kW, and \$2,696.90 a year. Cost of implementation was \$7.33 for the 20 minutes it took to set the timer.

#### 4. Coupled assembly fans

In one area of the plant, employees put couplings on the hose before it is shipped to customers. Currently the employees are not required to wear ear plugs, but the fans put in to cool employees creates a decibel reading high enough that OSHA recommends ear plugs. A quieter fan that used only a half horse power compared to the one horse power the current fans use, yet produces more cubic feet of air per minute, is replacing the louder fans. There are seven fans, and the savings associated with switching to the quieter fans is 16,380 kW and \$1,240 a year. Cost for the

fans is \$5,169.50.

#### 5. Lighting

The factory office and third-floor maintenance room have lights left on 24 hours a day, even when not in use. Motion sensors will be put in both areas. Savings associated with the project is 114,878 kW and \$8,949.09 a year. Cost of the project for parts and labor is \$3,668.

#### 6. Hand dryers

Gates currently landfills 9,309.3 pounds of paper towels each year. By installing high-efficiency Xcelerator dryers in the restrooms, Gates can dramatically reduce this waste. Because of employee needs, it is recommended that six paper-towel dispensers remain in Gates. Cost of the machines and installation will be \$13,384. By installing these machines and getting rid of the nonessential paper-towel dispensers, Gates can reduce their waste by 7,616.7 pounds and save \$27,407.40 in paper towel, house keeping, battery, and operational costs each year.

#### 7. Wooden pallet recovery

In order to move heavy objects, Gates uses wooden pallets that allow the objects to be lifted by a forklift. Previously, Gates was throwing away pallets that had been used once and were still in good condition. Work instructions were written by the intern helping the employees distinguish reusable pallets from broken

ones. In addition, the company that sells Gates their pallets, T&E, will now collect the broken pallets and refurbish them. The refurbished pallets will be sold back to Gates at a discounted price.

The final project involving pallets involved another company, ReelCore. ReelCore sends plastic reel parts to T&E on wooden pallets. Gates pays for these pallets, but cannot reuse them because they do not meet the required specifications. These pallets were landfilled. Now T&E will collect the pallets and send them back to ReelCore. After ReelCore receives their first shipment of pallets back from T&E, Gates will no longer be charged for pallets from ReelCore. Total waste reduction for this project is 214.17 tons of wooden pallets. Cost savings is \$38,079.73 annually.

#### 8. Compressed-air audit

A compressed air audit was done in the pole-built and HFM tester areas of the plant. A total of 59 compressed-air leaks were found using an ultrasonic leak detector. These leaks totaled 97,125,624 CFM. From the manufacturer of Gate's air compressor, it was found to take 126.7 kWh to produce 591.2 CFM. Total energy savings that could result from fixing these air leaks is 346,916 kW, and a cost savings of \$26,223.92.

### Summary of 2011 E2/P2 intern recommendations for Gates Corporation

Project description	Annual estimated environmental impact	Annual estimated cost savings	Status
Aerators in restrooms	947,815 gallons	\$4,701	Implemented
Timer on hump-hose hydraulic press	320,550 gallons / 14,625 kW	\$2,696.90	Implemented
Wooden pallet recovery	214.17 tons	\$38,079.73	Implemented
Coupled assembly noise-reduction fans	16,380 kW	\$1,240	In progress
Motion-sensor lighting	114,878 kW	\$8,949.09	Recommended
Low-flow toilets	1,177,114 gallons	\$5,837.98	Recommended
Hand dryers	3.95 tons	\$27,282.91	Recommended
Compressed-air audit	348,117.9 kW	\$26,223.92	Recommended
<b>Total savings *</b>	<b>2,445,479 gal, 472,799 kWh, 436,240 lbs. solid waste</b>	<b>\$114,766.52</b>	
<b>GHG reductions *</b>	<b>349.9 metric tons CO2e</b>		

\* Does not include projects that are "not recommended" or "further research is needed."