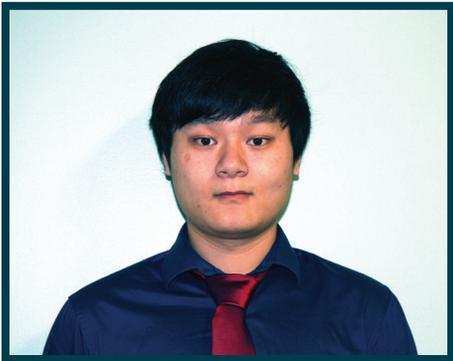


# Kraft Foods



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## Company Background

The Kraft Foods plant in Albany manufactures dried cheese products, blends cheese powders with other ingredients, and manufactures a semi-soft cheese. Three spray dryers are a key part of the operation and the plant produces about 43 million pounds annually, serving both internal and external customers. The plant currently occupies 83,800 square feet and employs 69 employees.



*"It was an honor working with such a supportive team and to be exposed to real engineering problems in the food industry. Working on this project gave me a better understanding of project management than I could get from a textbook."*

## Project Background

The goal of the project was to reduce both electrical and natural gas energy consumption to help meet corporate and plant sustainability goals. The dryers use heated air to dry the cheese products and heating this air is the largest fuel use. The primary objective for the project was looking at the mix of steam and direct-fired heating of dryer air. Progress was made in modeling dryer operations in order to optimize dryer air heating, but a means of guiding when

to use steam heating versus direct fired heating was not completed and will require further work. However, one fuel-saving measure was identified and recommended for implementation.

Air compressors were a significant load for electrical power and were thought to present opportunities. The 125hp compressor carries the air load during production and was the focus of this effort. The electrical cost of operating this compressor was extrapolated from 10 days of power measurements to be \$29,200 per year. Five savings opportunities were evaluated and three were recommended.

## Incentives To Change

The plant spent \$805,000 on natural gas and \$604,000 on electricity in 2013; electric rates increased by 10% in the last 8 years. Both the magnitude of utility spending and the trend toward higher utility rates were incentives to invest in energy conservation.

## Solutions

### Repair Compressed Air Leaks

Repairing compressed air leaks has the largest potential savings (\$6,400/yr.) and the lowest cost. Leak repair has started but needs to be institutionalized as an ongoing effort in order to maintain the savings. The leak rate was measured at 37% of compressor capacity. Efforts should be made to keep the leak rate below 15% of capacity.





### Shut Down Dryer 3 Air Preheater

Shutting down the dryer 3 air preheater for at least six warm months of the year is recommended to eliminate fan use and save \$900 per year in electricity and \$2,400 per year in natural gas use because the preheater is less efficient than the main burners, and because heat is not needed in work areas of the dryer tower as frosting (air restriction) does not occur on the inlet filters during the summer.

Air conveyance of ingredients in dryer 3 was identified as an area with likely potential compressed air savings, but the cost of these operations were not quantified and alternative means of conveying ingredients were not identified or evaluated.

### Lower Compressor Pressure

Lowering the compressor pressure from 115psi to 87psi (plant line pressure target is 80psi) is estimated to save \$4,400 per year in electrical energy charges and was demonstrated to be feasible for most plant air uses. An operator believed air flow to the dryer 2 vibrators might be restricted at lower pressure. The vibrators are regulated to 60 psi and it was demonstrated that the vibrator pressure was unaffected by lowering plant pressure, but we have yet to prove air flow is unaffected. This change would require adjustment of the compressor spiral valve air modulation control and would cost \$2,400.

### Retro-Fit Air Compressor With VFD

The compressed air service company Brabazon recommended retrofitting the 125hp compressor with a variable speed drive. They did not estimate or guarantee the savings from this change, but estimates of savings from the compressor performance curve suggest \$3,000 per year could be saved with an initial investment of \$7,250.



Recommendation	Reduction	Annual Savings	Status
Repair air leaks; maintain at 15% or below	107,000 kWh	\$6,400	In progress
Lower compressor pressure	73,000 kWh	\$4,400	Pending
Retro-fit air compressor with VFD	49,900 kWh	\$3,000	Recommended
Shut down dryer 3 air preheater	11,700kWh 4,300 therms	\$3,300	Recommended