2011 24-WEEK INTERNSHIP

# CNH AMERICA, LLC

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BURLINGTON

## COMPANY BACKGROUND

CNH America, LLC was formed in 1999 when New Holland HV and Case Corporation merged, and is now part of the Fiat Group. Rising to be a leader in the manufacturing of construction and agricultural equipment, CNH is a global company with dealers in 170 locations and 37 manufacturing plants. The Burlington plant is one of 9 CNH manufacturing plants in the United States. Approximately 650 people are employed at the Burlington plant, which makes the tractor loader backhoe, utility tractor, rough terrain forklift and combine header.

## PROJECT BACKGROUND

This is the fourth year of participation in the Pollution Prevention Intern Program for the CNH-Burlington plant. The purpose of this year's 24-week project was to create an energy profile of the Burlington plant and identify opportunities for saving energy and reducing costs. Options included reducing demand and power factor costs. Other projects will be prioritized based on a matrix of efficiency and potential cost savings. The major focus was on lighting, ventilation and proper equipment efficiencies.

## INCENTIVES TO CHANGE

CNH-Burlington spends more than $100,000 per month for electricity in the production plant. Peak demand charges and power factor charges account for a significant amount of this cost. The energy profile revealed preliminary information on where and when the energy is being used, in order to guide reduction efforts. An objective of the Fiat Industrial Group is to ensure that each of its plants is a "green" plant.

## RESULTS

**Lighting Retrofit:** The plant spends an estimated $433,000 a year for lighting alone. The main contributor to this cost is aging, inefficient lighting. Replacing old 400W metal halide lighting fixtures with new T5HO linear florescent lamps and fixtures will provide significant cost savings. The lighting upgrades are currently in progress. Installing controls to the new lighting system will further improve the efficiency of the lighting system.

**Fan Replacement:** The plant has an estimated 300 ⅓ hp fan motors that are over 20 years old; with power factors lower than 60 percent. These inefficient motors contribute to the plant's very low power factor. Many fans are available that can produce the same output with less power and a much higher power factor. Replacing all of the plant's ⅓ hp fans with ¼ hp fans would not be feasible due to the long return on investment. The major impact of fan replacement would be an increase in power factor. It is recommended that the fans are replaced with high-efficiency models when they malfunction.

**Air Balance Study:** Air balance refers to the amount of fresh air intake compared to air exhausted. This is based on design specifications. The results of an air balance study showed that the entire plant has a negative pressure of 1.1 million cfm. A negative air-pressure causes high heating costs, due to the infiltration of the open pathways such as doors and leaks. The air balance study was primarily performed to obtain information and no projects have been presented to correct the negative pressure.

**CONVENTIONAL AIR POLLUTANTS AND GREENHOUSE GASES DIVERTED IN STANDARD TONS**

| Total for all sectors | | | | | |
|---|---|---|---|---|---|
| $CO_2$ | $SO_2$ | $CH_4$ | $N_2O$ | CFC | $PM_{10}$ |
| 1509 | 7.74 | 49.12 | 0.07 | 17.64 | 0.18 |

**Solar Water Heating:** Two large bathrooms in the plant have showers that use a large amount of hot water. It is recommended that two solar water heaters be installed to reduce the natural gas used to heat the water. The cost of natural gas at the plant's locality is relatively inexpensive, but use of renewable technologies is an important part of the CNH plan to "go green".

**Capacitor Banks:** Capacitor banks are used to increase the power factor by reducing the inductance load. The reason for the low power factor at the plant is unknown but aging equipment in the mechanical system is believed to be a main contributor. The utility company charges a fee for having such a low power factor. Using capacitor banks will not correct the root cause but provides a quick, cost-effective solution to eliminate extra fees while investigating the cause. The use of capacitor banks could reduce utility costs by more than $70,000 annually.

| PROJECT | ANNUAL COST SAVINGS | ENVIRONMENTAL RESULTS | STATUS |
|---|---|---|---|
| LIGHTING RETROFIT | $27,173 | 400,320 KWH | IN PROGRESS |
| FAN REPLACEMENT | $32,702 | 441,164 KWH | RECOMMENDED |
| SOLAR WATER HEATING | $378 | 663 THERMS | IN PROGRESS |
| CAPACITOR BANKS | $70,000 | TBD | RECOMMENDED |