ZOETIS

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COMPANY PROFILE

Zoetis is the largest producer of animal vaccines and health products in the world with 27 facilities globally. The Charles City, Iowa, facility employs more than 400 people. The facility runs 24 hours per day, 7 days per week although the majority of employees work Monday-Friday. Zoetis produces many different products such as vaccines, anti-infectives, and parasiticides. These products are used by farmers and pet owners primarily for chickens but also for many other animals such as dogs, cats, cattle, swine, poultry, and horses.

PROJECT BACKGROUND

Zoetis' energy bill is calculated from actual energy usage and the highest rate of demand in a month. Utility providers must maintain the capacity to provide energy without interruption when all facilities drawing on that source are operating at maximum energy usage. The cost of this stored energy is passed on to the consumer in the form of peak demand charges. The goal of this 24-week project is to identify key contributors to the electrical load and develop strategies to reduce energy consumption particularly during peak load hours.

INCENTIVES TO CHANGE

The production processes at Zoetis require a highly controlled environment. Maintaining such specific environmental conditions can be very energy intensive. Zoetis is continually seeking opportunities to improve the efficiency of its facility and improve environmental performance. Identifying and improving the efficiency of major energy users could significantly reduce energy costs and improve environmental impact.

RESULTS

Peak Demand Impacts: The greatest impact on peak demand of all of the analyzed criteria was dew point, which is a weather measurement that incorporates both temperature and humidity. The reason that dew point has such a significant impact on the facility's energy demand is that the air needs to be treated when either the temperature is high or humidity is high. Additionally, the equipment used to counter the heat and humidity conditions are large energy users such as chillers and air handling units.

The air handlers cool air to a designated set point when the outdoor air temperature is too high. To reduce humidity, the air handlers cool the air even further, which condenses moisture out of the air. The air is then heated back up to the temperature set point. Given this additional workload, dew point has large impact on the electrical demand from the chillers and air handlers.

In addition to the increased demand of dew point conditions, the billing rate also increases during the summer, which results in a significant increase in electricity costs for the summer months. The chillers account for a large portion of the energy use in the summer. These two findings suggest that improving the efficiency of the chillers and air handlers could significantly reduce energy usage and associated costs.

Freeze-dryers: Seven freeze-dryers are used in one of the production processes where energy usage is high. The freeze-dryers have a spike in energy usage when they start and another spike after they finish with a batch. Since the peak demand occurs in the afternoon, the freeze-dryer's early morning startup is not likely creating an increase in the peak-demand charges. The spike at the end of a cycle has been attributed to a very short process called the pump down. A review of the method used by Zoetis' utility provider for recording energy data revealed that the short duration of the energy spike during pump down is also not likely to have a significant impact on peak demand charges; however, improving the efficiency of the freeze-dryers would reduce the overall energy load thus reducing the amount of energy needed during peak demand hours.

The majority of opportunities to reduce energy demand during the afternoon hours appear to be with the chillers and air-handling units.

Next Steps: During the second 12 weeks of the project, the intern will research strategies to optimize the efficiency of these units and develop cost-effective recommendations to reduce energy consumption and associated demand charges.

The intern is currently testing the effects of changing room-air set points. The intern will also evaluate equipment shutdowns during periods of peak demand, setbacks, occupancy sensors, and improvements in equipment efficiency.