



# FOCUS ON CASE STUDIES: AERATION SYSTEM RETROFIT

## The Background

The City of Waupaca's wastewater treatment facility wanted to reduce their energy usage and cost by updating its current aeration system. Aeration systems should be assessed on a regular basis to determine if they are operating as efficiently as possible. This assessment should compare the present loading conditions and system performance in kWh per million gallons and other key performance indicators with those of similar facilities. Potential improvements to consider include:

- **Fine-bubble aeration**
- **Dissolved oxygen control**
- **Variable air flow rate blowers**

The City of Waupaca's current aeration system was inefficient, leading to significant energy costs each month. They completed an assessment to identify changes it could make to improve treatment processes and reduce maintenance costs at the facility.

## The Approach

The City of Waupaca needed a long-term solution to ensure its facility could properly implement secondary treatment processes such as activated sludge, aerobic digestion, channel aeration, and post-aeration systems. While working with its Focus on Energy Advisor and Trade Ally to explore possible modifications, it was suggested that the City consider retrofitting its current system by installing a smaller horsepower (HP) blower controlled with a variable frequency drive (VFD) based on the dissolved oxygen (DO) sensor. The DO sensor indicates the optimal speed the blower should meet.

## The Solution

The City of Waupaca originally used a 150 HP blower while operating without a VFD. They were able to retrofit their current system to use a 50 HP blower controlled by a VFD. These updates will allow the City of Waupaca to realize up to 70% in energy savings with the modified aeration system. In total, it received over \$19,000 in Focus on Energy incentives and was able to realize almost \$28,000 in annual energy cost savings on the City's utility bill.

## Project Breakdown:

- **Equipment Installed:**  
Retrofit to 50 HP blower controlled by a VFD
- **Estimated Project Cost:**  
\$79,900
- **Annual Energy Cost Savings:**  
\$27,869
- **Focus on Energy Incentive:**  
\$19,003
- **Payback:** 2.9 Years

“ Our previous blowers were running at the slowest speed and providing more air than was needed, resulting in a waste of energy, maintenance, and process efficiencies. Working with Focus on Energy to upgrade to a smaller blower made the whole project a slam dunk. ”

**Justin Berrens**  
Director of Public Works  
City of Waupaca

## REDUCING ENERGY WASTE ACROSS WISCONSIN

Focus on Energy, Wisconsin utilities' statewide program for energy efficiency and renewable energy, helps eligible residents and businesses save energy and money while protecting the environment. Focus on Energy information, resources and financial incentives help to implement energy efficiency and renewable energy projects that otherwise would not be completed.

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