



## ENERGY EFFICIENCY: MANAGING CONSUMPTION AND DEMAND

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Historically, our water and wastewater systems were designed with two things in mind: to meet regulatory requirements and to protect human health and the environment. Unfortunately, in many cases, optimizing electric consumption was an afterthought and over time these costs have been seen as just the cost of doing business. Spending large amounts on utility bills may be built into your annual budget, but at what cost? Spending more in one area means you must spend less somewhere else to ensure fair rates for your customers while maintaining funds for capital improvements.

If you would like to see your electric bills go down, creating an energy management plan is a great place to start. The two most important parts of your plan will be managing your total energy consumption and controlling your peak demand charges.

Decreasing the amount of electricity your system uses is the first way to reduce your system's annual operational costs and there are several ways to do this without redesigning your entire system. The most popular is to invest in variable frequency drives for your larger pumps and blowers; if you already have VFD's, make sure they are properly calibrated. A VFD allows you to control the speed of an electric motor. Due to Affinity Laws, slowing the speed of a motor's rotation should lead to dramatic reductions in the amount of energy needed to power the motor. The power requirement (horsepower or kilowatts) varies by the cube of the change in speed. So, two times the speed would burn eight times the power, while one half the speed would require one-eighth the power to drive the motor. By installing a VFD on a motor and reducing the motor speed by 20% (from 60 Hz to 48 Hz) your system could see a 50% reduction in the amount of energy consumed by the pump, blower, or drive.

Another large component of reducing electric consumption is proper management of aeration systems. Blowers are often the largest consumer of electricity in wastewater treatment facilities. Their function is necessary to the treatment process, but over aeration can be like flushing money down the drain. By automating controls to provide the right amount of air, based on oxygen demand, and maintaining diffusers to ensure proper air introduction, your system can experience an increase in energy efficiency.

While reducing energy consumption is often the main goal of energy management plans, manipulating your operations

schedule can sometimes lead to direct energy cost savings by mitigating demand fees. As larger electric motors turn on, they draw large amounts of electricity. Commercial electric users are often charged a demand fee as a penalty for drawing too much electricity from the grid at a time. The monthly demand fee for your system is calculated as the highest number of kilowatts drawn during any 15- or 30-minute period in the billing cycle multiplied by the demand fee. In many cases, the monthly demand charge can account for 30 to 60 percent of your total monthly electric cost.

Reducing your demand charge can be as simple as staggering when certain components of your treatment system turn on. For example, say you have a simple groundwater system that has two well pumps that run concurrently for 3 hours each day. Adjusting so that one pump runs for 6 hours each day or staggering each pump's 3-hour cycle could cut your demand charge in half.

Small changes can have a large impact on your operational costs, and forming a plan is the first step. If you would like help forming an energy management plan for your system, please feel free to let New York Rural Water Association help. Our free energy assessments are a great tool for identifying how to get portions of your electric fees back into your operating budget. You can email me at [gardner@nyruralwater.org](mailto:gardner@nyruralwater.org) or call 518-828-3155 ext. 120. 💧💧