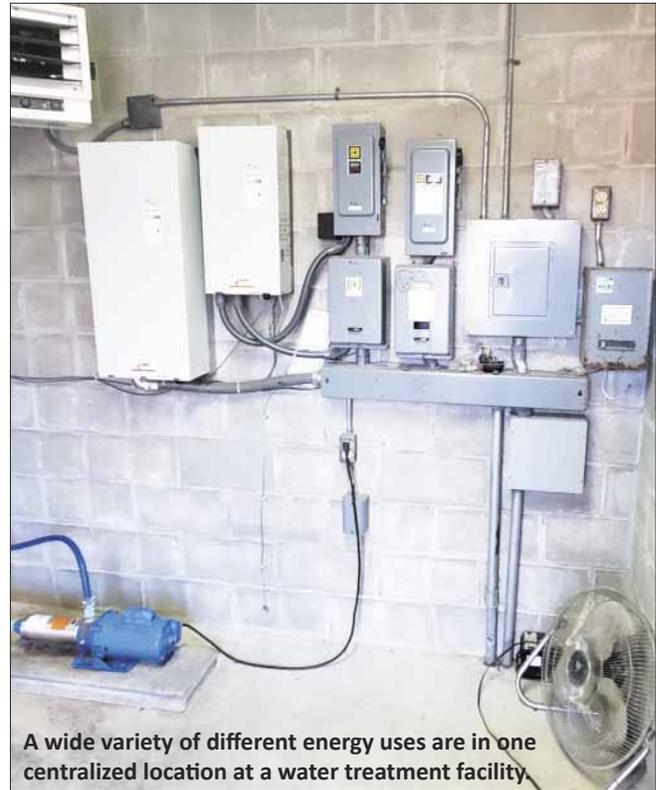


Energy Efficiency – Great for the Environment, Great for Your City’s or RWD’s Bottom Line!

As an operator, I recall on more than a few occasions trying to find ways to work the budget so that I could get parts and pieces needed to keep the plant operating properly. More often than not, the City Manager would ask me, “How are we going pay for that?” He was not asking if we would open an account with a particular vendor, or even implying that I would have to pay for it out of my own pocket. The city manager was simply pushing me to find new ways to stretch the existing dollars that were allocated to that department. As frustrating as it was at the time, I can look back now and appreciate the lessons I learned from him, and how I should approach all manner of problems. I get to live out my dream on a daily basis, I get to help operators all across our great state every single day. Almost every time without fail, the major problem I found in smaller communities is financial. It can be extremely challenging for many systems to maintain their water and wastewater plants while keeping up with inflation, paying their operators a competitive wage, and not increasing rates so much that their customers can no longer afford the water we all must have to survive. So, what’s the solution? As we have learned long ago there is no silver bullet to fixing problems in this industry. Maybe an energy assessment is one way to help with those O & M problems.

According to the EPA, as much as 10% of a small local government's total budget is electricity costs. A wastewater plant uses 25% to 40% of their total budget on electricity, and a water plant can use up to 80% of its operating budget in processing and distribution on electricity. These represent significant portions of a budget, and these numbers track pretty well across the board in cities with mechanical wastewater and water treatment plants. Finding electrical savings can have long-lasting effects on treatment budgets, it’s capturing these savings that can often be the trouble.

Kansas Rural Water Association with financial assistance from National Rural Water Association, offer free of charge to all systems serving less than 10,000 people, or any system that has a current Rural Development loan, an energy assessment customized and tailored to the individual water and wastewater plant. It’s a simple matter to walk into a plant and tell the operator if they change their old light bulbs to LED bulbs, and a quick google search would even tell someone how much savings can be achieved from that, and that does work. However, KRWA has teamed up with Energy Solutions Professionals to take a more holistic approach to energy savings, and looking at every aspect of the treatment process and see where the most energy savings can be had.



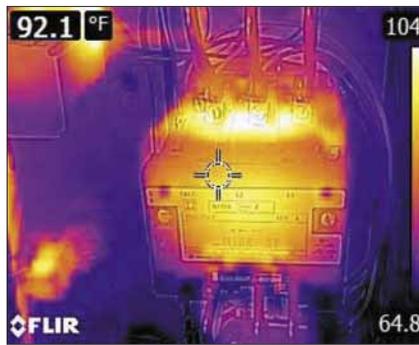
In any energy efficiency assessment, the first goal is to find those no-cost operational changes that have typically the most significant savings. Since they have no upfront cost, they have instant payback to the system. Some of the things I have found that were no cost adjustments, were simple things like adjusting backwash times and rates. By testing the backwash water on a consistent basis, and only shutting down the backwash when the water reaches a pre-determined point, then shutting down. There is a real opportunity to see real cost savings, just by moving away from the old way of doing things to a more calculated method.

The secondary goal, is to find low-cost improvements that can hold significant savings. Low-cost solutions, can be simple and cheap items, such as LED bulbs that we discussed earlier. Other low cost savings can be found using smaller variable frequency drives (VFD’s). A VFD can save a system money, only if the motor can be slowed down. A motor that will need to be controlled and operated at 100% or 60 hertz, will actually lose 2% to 3% with a VFD if it has to operate at 100%. If it does have to operate at 60 hz, not only does it have to use the electricity to run the motor, it also has to operate the VFD. A VFD operates by converting

AC power into DC power, adjusting the hz at the DC scale, and then converts it back to AC power. If there was no adjustment being made during that DC stage, then the energy needed to convert the power is not required yet is still taking place inside the VFD. On average, if the load can be reduced to 80%, it will reduce the total energy required by 50% and only require the motor to operate 20% longer. Just keep in mind, a lot of other things that can go into the decision of whether a VFD can be put into place and actually gain a savings. Things like pressure and pump curve efficiency have a lot to do with whether or not the motor can be turned down or not.

The very last energy savings we look for are those that will cost a lot to implement. The potential savings from large investment proposals are significant. However, they have to be to justify even mentioning them, and they can often have a six to ten-year return on investment. It is up to the individual city or RWD to decide whether or not the large capital investment is worth the long-term savings. But the assessment will show that. What I often recommend to systems in this situation is to grab the low hanging fruit first. Take the no cost or least expensive options and implement them, and see the savings first before making the commitment in the larger scale. By being able to see the savings in the small scale, the system can then take the leap with the larger investment with more confidence.

So why should water and wastewater systems have an energy assessment performed at their facility? It can depend



This thermal image shows excessive heating of electrical components inside a well house.

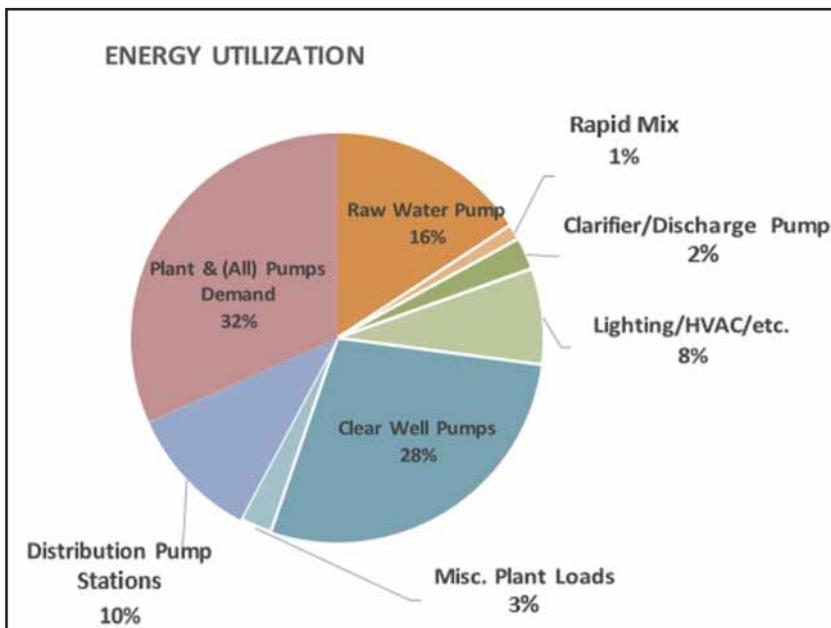
greatly on the system, and their individual “why”. A newer plant, may not feel they could benefit from an assessment, and the best case scenario there is they are right, and they are doing all they can to conserve energy. Often times, though coming in with a new set of eyes and a different perspective an energy efficiency technician, can locate small yet effective ways to save the utility some electrical costs. In an older plant, there are typically many different ways to save the utility money on the electricity.

Older motors, although reliable, are not as efficient as newer motors and pumps. By simply replacing the older and worn out motor, energy savings can be quite significant.

To get started on an energy assessment, all KRWA needs is an e-mail or phone call from you stating your interest. From there we will need three years of electricity costs, we use three years rather than the minimum of one, to help rule out any anomaly years. Once we have reviewed the energy data, we will set up a site visit at the treatment plant with anyone who would like to join, preferably the supervisor or foreman be on-site to help answer any questions. Once the on-site visit is completed, we will need a bit of time to complete the final report. The report you receive is an actionable report you can take to the city or RWD manager or council or board to show them by the numbers how much energy savings can be realized at the utility. Once again, all of this is free to the utility, so there is really nothing to lose.

The Kansas Rural Water Association has partnered with Energy Solutions Professionals (ESP) on some of the larger projects. ESP does outstanding work and provides a guarantee of the projected savings. Any water or wastewater utility management will benefit greatly from having an energy assessment conducted. Give KRWA a call and we’ll get things going. Best of all – there’s no cost to the city or RWD!

Stewart Kasper joined KRWA staff in August 2020 as Technical Assistant/Trainer. He holds a Class IV operator certification for water and Class IV operator certification for wastewater in Kansas. Prior to joining KRWA, he was water plant operator at Rural Water District No. 2, Miami County.



Breakdown of all energy usage at a water treatment plant.

2022 KRWA 53rd Annual Conference March 29 -31

Century II Convention Center, Wichita, KS

Entrance			1	2	3	4	5	6	7	8	<p>Associate Members have requested more than 260 booth spaces as of October 1st. Mark your calendars now for the largest water and wastewater industry conference and exhibition in Mid-America, March 29 – 31. Century II Convention Center, Wichita, Kansas.</p>														
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