By Dr. John Regnier, Consultant, National Rural Water Association

Ergs, Joules & Such

Notes On Energy Savings for the Rural Water Community and Maybe Others

My unstated goal with all this energy-related information is to try to raise the awareness of the rural water systems and smaller towns of the critical importance of energy to the water and wastewater industries and profession. There are rather startling opportunities for savings in dollars, energy and water that are available for very little expenditure of effort or capital outlay.

A few months ago, I had occasion to develop an Excel spreadsheet to calculate estimated energy savings possible in small water systems. These calculations were based on populations under 10,000 served by public systems as reflected in EPA's 2008 Water Factoids. I made certain assumptions that are detailed in the spreadsheet. It should be emphasized that the resulting figures are estimates only and their validity is dependent on the validity of the assumptions made. KRWA has made a copy of the spreadsheet available on the KRWA Web site (www.krwa.net), then under "Online Resources" and then "Downloads".

Values are calculated for each state and then summarized for the U.S. This allows for anyone to pull out individual state values if interested. Here are my observations:

- Somewhat irrespective of the accuracy of the estimates, the magnitude of the numbers involved speak for themselves - there is enough water, energy and money out there to warrant some serious attention.
- Although water systems have been focusing on leak detection for 20 years or more (with considerable success), systems the U.S. are still losing a huge amount of water through leakage because of some outmoded assumptions regarding acceptable water loss and some inefficient approaches to identifying when leaks occur. The spreadsheet assumes that average water loss is 20 percent; this can be reduced to 15 percent, as indicated in the spreadsheet notes, these percents can be toggled to other values to see what the effect is.
- We need better education of our water operators, probably as a part of our certification requirements, in the intricacies of energy billing and management. I consistently find that electrical bills in water systems can be reduced by 10 to 20 percent by simple operational changes that don't compromise system operations and cost little or nothing in capital expenditures. The spreadsheet assumes a 10 percent savings in these bills; the reduction I have referred to as direct electric savings.

I have received enough inquiries lately about these estimates that I thought it would be worthwhile to devote an issue to this topic. This article was adapted for publication by KRWA. The summary figures are presented below. I do hope this is useful information. Send an email to highpnt@mindspring.com if you have any questions or comments.

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SUMMARY OF ENERGY CONSERVATION FACTOIDS FOR U.S. SYSTEMS SERVING LESS THAN 10,000 PEOPLE

Annual Water Production for Systems Serving Less Than 10,000 people	1,871,900,488,000	gallons
Annual Electric Cost for Systems Serving Less Than 10,000 people	$935,950,244	
Annual Water Saved by Reducing Unaccounted For to 15%	93,595,024,000	gallons
Annual Energy Money Saved by Reducing Unaccounted For to 15%	$46,797,512	
Annual Energy Saved by Reducing Unaccounted For to 15%	467,975,122	kilowatt-hours
Annual CO_2 Emissions Avoided by Reducing Unaccounted For to 15%	608,367,658	pounds
Annual Energy Money Saved by Direct Electric Conservation	$93,595,024	
Annual Energy Saved by Direct Electric Conservation	935,950,244	kilowatt-hours
Annual CO_2 Emissions Avoided by Direct Electric Conservation	1,216,735,317	pounds
Total CO_2 Emissions Avoided Per Year	1,825,102,975	pounds
Total Energy Saved per Year	1,403,925,366	kilowatt-hours
Total Money Saved Per Year	$140,392,536	