

# Water Utility Benchmarking Analysis

The Municipal Energy Efficiency Technical Assistance Program (MEETAP) analyzed Public Service Commission of Wisconsin (PSCW) and Wisconsin Department of Natural Resources (WDNR) water utility regulatory filing databases to develop energy use benchmarks for water utilities. These benchmarks provide a value water utilities can use to compare their existing energy consumption and evaluate energy savings opportunities. Facilities with multiple pumping stations, elevated storage, and high pumping costs are candidates with a large potential for cost savings.

Median Values in benchmarks for normalized energy use, energy expenditures, electric rate and percentage water loss for each of the PSCW classes are compared below:

## Median Values Between Classes 2010 - 2014

Utility Class	Number of Customers	Utilities in Database	Energy Use kwh/1000 Gal	Energy Expenditures \$/1000 Gal	Energy Expenditure \$/kwh	% Water Loss
AB	> 4000	97	1.79	\$ 0.1810	\$ 0.1100	11.20%
C	1000 - 4000	151	1.96	\$ 0.2337	\$ 0.1223	11.77%
D	<1000	326	2.40	\$ 0.3122	\$ 0.1286	13.03%
Total		574	2.07	\$ 0.2619	\$ 0.1237	12.22%

*\* Count varies year-to-year from missing reports, change in class, etc. Overall median for reporting utilities 2010-2015*

Class AB utilities have both the lowest median values for each of the categories - consistent with economies of scale - and the smallest variability of reported values compared to the smaller Class C and Class D utilities:

2010-2014 Comparison of Interquartile Ranges						
Utility Class	Number of Customers	Utilities in Database	Energy Use kwh/1000 Gal	Energy Expenditures \$/1000 Gal	Energy Expenditure \$/kwh	% Water Loss
AB	> 4000	97	1.37 - 2.13	0.136 - 0.225	0.085 - 0.13	8.46 - 14.98
C	1000 - 4000	151	1.56 - 2.47	0.181 - 0.308	0.111 - 0.137	7.23 - 15.58
D	<1000	326	1.69 - 3.57	0.215 - 0.466	0.114 - 0.143	8.59 - 21.49
Total		574	1.58 - 2.95	0.188 - 0.37	0.11 - 0.14	8.18 - 18.41

MEETAP can provide utility specific baselines by quartiles showing how they compare to facilities in the same class

Name	Class	Energy Use kwh/1000 Gals Quad	Energy Expense \$/1000 Gals	Energy Expense \$/kwh	% Loss	% Purchased Water	% Surface Water	% Ground Water
Sample 1	AB	2	2	2	3	0.0%	0.0%	100.0%
Sample 2	AB	2	4	4	4	0.0%	0.0%	100.0%
Sample 3	AB	4	3	1	2	0.0%	72.4%	27.6%
Sample 4	AB	4	4	3	1	34.9%	0.0%	65.1%
Sample 5	C	1	2	4	2	0.0%	0.0%	100.0%
Sample 6	C	2	3	3	3	30.3%	0.0%	69.7%
Sample 7	C	4	4	3	1	0.0%	0.0%	100.0%
Sample 8	C	1	1	3	3	100.0%	0.0%	0.0%
Sample 9	D	1	1	1	3	0.0%	0.0%	100.0%
Sample 10	D	4	3	2	1	0.0%	0.0%	100.0%
Sample 11	D	3	3	3	2	0.0%	0.0%	100.0%

Utilities in the 3rd (Yellow) and 4th (Red) quartiles can request that MEETAP prepare a system analysis of wells, towers, and pumps to estimate demand, energy, and cost savings (capacity and average operating characteristics – on-peak, capacity factor, constant flow high pressure control vs. variable flow constant pressure, etc. . .

Data collected and analyzed by MEETAP show the best opportunities to increase efficiencies exist in the use and optimization of on-site supervisory control and data acquisition (SCADA) to monitor and control system functions and production demands. Updated SCADA systems help utilities perform better, more efficiently, more economically and reduce risks to the environment and public health. MEETAP and Focus on Energy can assist in evaluating project costs and simple payback, combining Focus on Energy incentives with low-interest funding for SCADA equipment installation through the [Clean Water Fund Program \(CWFP\)](#) and the [Safe Drinking Water Loan Program \(SDWLP\)](#). Equipment installation and startup costs paid to a web-based SCADA system provider could open up new opportunities for economically-disadvantaged and smaller municipalities, potentially adding capacity to run their utilities more efficiently and effectively.

Sources: Wisconsin Department of Natural Resources: Environmental Improvement

Fund <http://dnr.wi.gov/Aid/EIF.html>

DNR SCADA Info <http://dnr.wi.gov/news/input/documents/guidance/SCADAWaterMeterGuidanceFinal.pdf>