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WISCONSIN SCHOOL BENCHMARKING RESULTS

Managing what you measure

In the fall of 2018, FOCUS ON ENERGY® provided an opportunity for Wisconsin K-12 public school districts to track and compare the energy usage of their buildings with other schools throughout the state.

Focus on Energy coordinated with participating school districts to obtain each building's utility information, square footage, space characteristics and usage details. Each district participating in the study was then benchmarked using B3 Benchmarking software and, in return, district participants received access to the various B3 Benchmarking tools.

97% of the schools that participated in 2018 have worked with Focus on Energy in the last eight years - saving enough energy to power 21,079 homes for a year!

Real results

Wisconsin public schools collectively spend over \$175 million in energy costs each year. Wisconsin schools have reduced their energy use by 23% compared to Focus on Energy's 2006 benchmarks, resulting in savings of over \$40 million being reinvested in Wisconsin's educational system.

If all the buildings in the study improved their energy usage to exceed the current energy code, schools would **save an additional \$8,220,000 in utility costs!**¹

¹B3 calculated the energy savings opportunities for buildings with energy usage over 15% higher than the current energy code prescribes.

Energy efficiency projects through Focus on Energy not only lower your school district's energy bills but also the budgeted savings could be put towards:

- Hiring more teachers
- Purchasing more computers and tablets
- Investing in future energy efficiency projects for your district

These are a few of the ways we all benefit by making energy efficiency a priority. Find out how your district can get in on energy efficiency.

888.947.7828
focusonenergy.com/AgSG

WISCONSIN



focus on energy®

Partnering with Wisconsin utilities

2018 Benchmarking results

Focus on Energy worked with over half of the school buildings in Wisconsin to collect and analyze building and utility data. Schools were located all over the state, representing 94% of Wisconsin counties. Benchmarked schools were categorized as elementary, middle or high schools, with K-12 buildings considered a high school in the analysis.

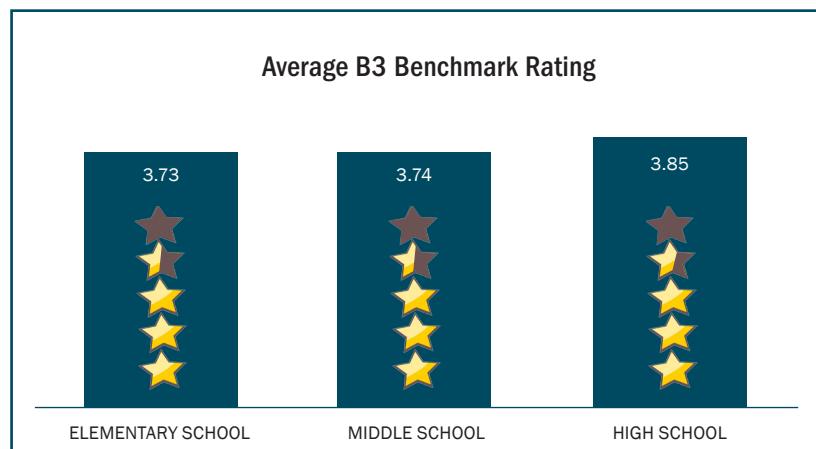
Participant Statistics	
Number of Districts	212
Number of Buildings	1,223
Annual Energy Costs	\$95 million
Student Population	571,500
Average Building Size (ft ²)	107,002
Smallest (ft ²)	1,500
Largest (ft ²)	847,074
Average Year of Construction	1968
Year Built, oldest building	1857
Year Built, newest building	2018

B3 Benchmarking provided a comprehensive analysis of each building's energy performance, including energy consumption, carbon emissions and costs in easy-to-understand reports. These reports included a district summary, which prioritized buildings with the most energy savings potential, and a one-page detailed report for each building containing the following benchmarks:

- **B3 Benchmark:** Compares each building's energy consumption to the current energy code, IECC 2015.
- **B3 peer rating:** Compares each building to other similar buildings that also participated in the study.
- **ENERGY STAR® Score:** Compares each building's energy consumption to similar structures nationwide.

B3 Benchmarking is a software program that helps participants find the highest potential for energy improvement and maximum return on investment. B3 Benchmarking creates actionable reports using only monthly utility billing data and basic information about the building.

According to energy.gov, benchmarking is the practice of comparing the measured performance of a device, process, facility, or organization to itself, its peers, or established norms, with the goal of informing and motivating performance improvement.

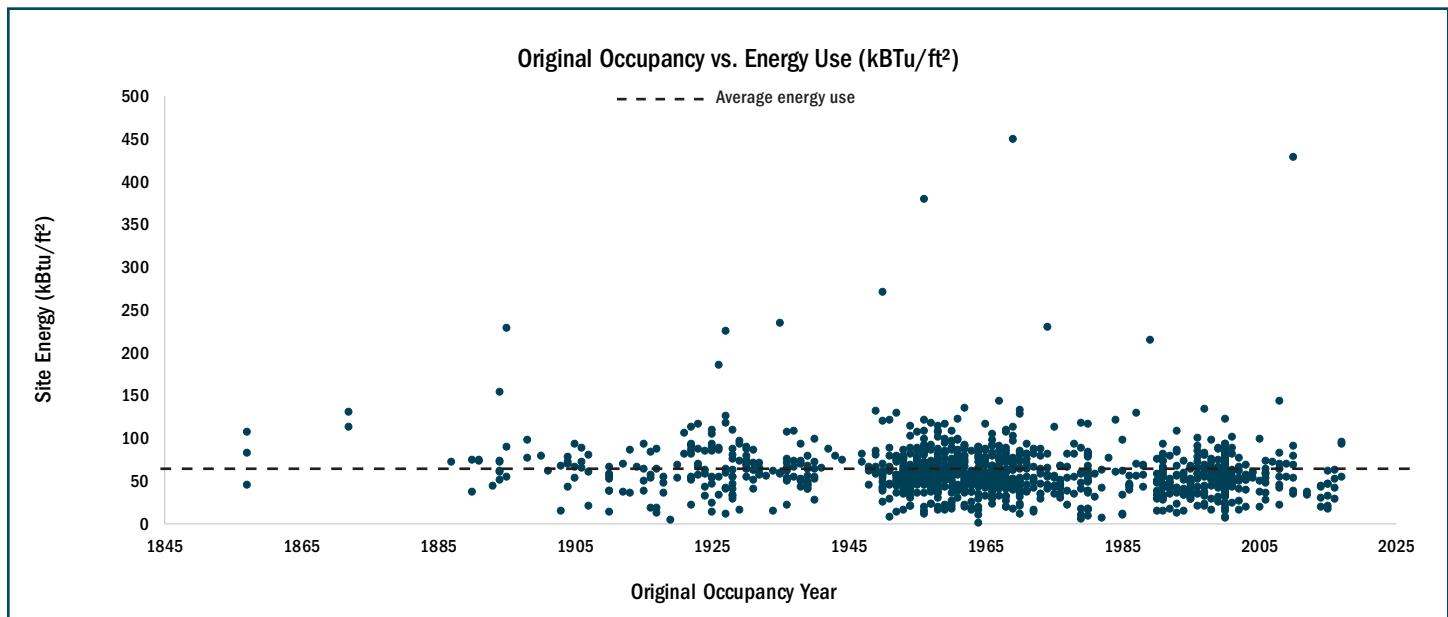


On average, Wisconsin schools operate 50% better than the energy code standard, as demonstrated by the average B3 Benchmark. A score of 2.5 indicates schools are meeting energy code.

Three key takeaways

1. Building size or age was not an indicator of energy use.

- The operation of the building has a more significant effect on energy usage than the size or age. Well-trained buildings and grounds managers can save districts thousands of dollars each year in energy costs.



2. The type of school had a greater effect on the overall energy use than the building size or age.

- An elementary school uses approximately 10% more per square foot in gas heating energy than a high school but approximately 15% less electricity per square foot. Elementary schools likely have less-efficient heating systems or they keep the room temperatures warmer during the heating season.
- High schools use more electricity because they have additional equipment or systems such as air conditioning. High schools also tend to host more events, such as sports practices, summer camps and community events, all of which add to their overall energy use.
- Middle schools averaged the lowest total kBtu/ft² and heating energy/ft².

3. On average, schools with a pool use 12% more energy than schools without a pool.

Energy Use Break Down			
	Overall Energy Use (kBtu/ft ²)	Natural Gas Use	Electricity Use
Elementary School	60.3	72%	28%
Middle School	57.3	68%	32%
High School	59.7	66%	34%
Schools with Pools	67.1	68%	32%

Comparing results: 2006 v. 2018

Focus on Energy completed a similar study in 2006 with public school buildings. The buildings represented in the 2006 study and 2018 study have very similar participation and square footage. **Focus on Energy recognized an average decrease in total energy use of 23%.²**

	2006	2018
Districts	226	212
School Buildings	1,293	1,213
Million Square Feet	109	129
Total Energy Use (kBtu/ft ²)	70.70	54.31
Heating Fuel Use (kBtu/ft ²)	49.60	34.76
Normalized Heating Fuel Use (kBtu/ft ² / Heating Degree Day (HDD))	7.20	5.04
Electricity Use (kWh/ft ²)	6.00	5.73
Decrease in energy usage between studies	23%	

Heating fuel usage reduced 30%.

- Focus on Energy helped over 75% of the public schools reduce their heating fuel usage.
- Common strategies documented by Focus on Energy include energy-efficient condensing hot water boilers, energy recovery ventilators, demand-controlled ventilation controls and building automation controls.

Electricity consumption decreased by only 5%.

Forty-four percent of schools in Wisconsin have invested in air conditioning over the past 12 years to enhance occupant comfort. An air-conditioned building typically uses 25% more electricity. Even with this increase, electric consumption still dropped as a result of:

- Conversion to LED lighting technology.
- Adding controls to fans and pumps to condition the buildings.

Next steps

Data from this benchmarking study will help districts better manage their energy use. Districts can now produce fact-based energy consumption forecasts, devise energy reduction strategies and measure actual improvement. Districts can even use real data to prioritize projects and develop implementation schedules. Most importantly, decision-makers can stretch limited budgets by working with a technical expert who will help them recognize high energy consumption based on monthly and yearly data. This data can identify the type of equipment that needs attention, resulting in fewer energy inefficiencies.

An Energy Advisor from Focus on Energy will help discover the technical and financial potential associated with qualifying equipment to maximize energy savings and return on investment. Find your Energy Advisor by visiting focusonenergy.com/ea-map. Learn more about strategic energy planning in the *School & Government Facilities Energy Best Practices Guide* available for download at focusonenergy.com/guidebooks.

²Normalizing the data for the weather (comparing heating degree days from 2005/06 to 2017/18 to more accurately compare the data).

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.