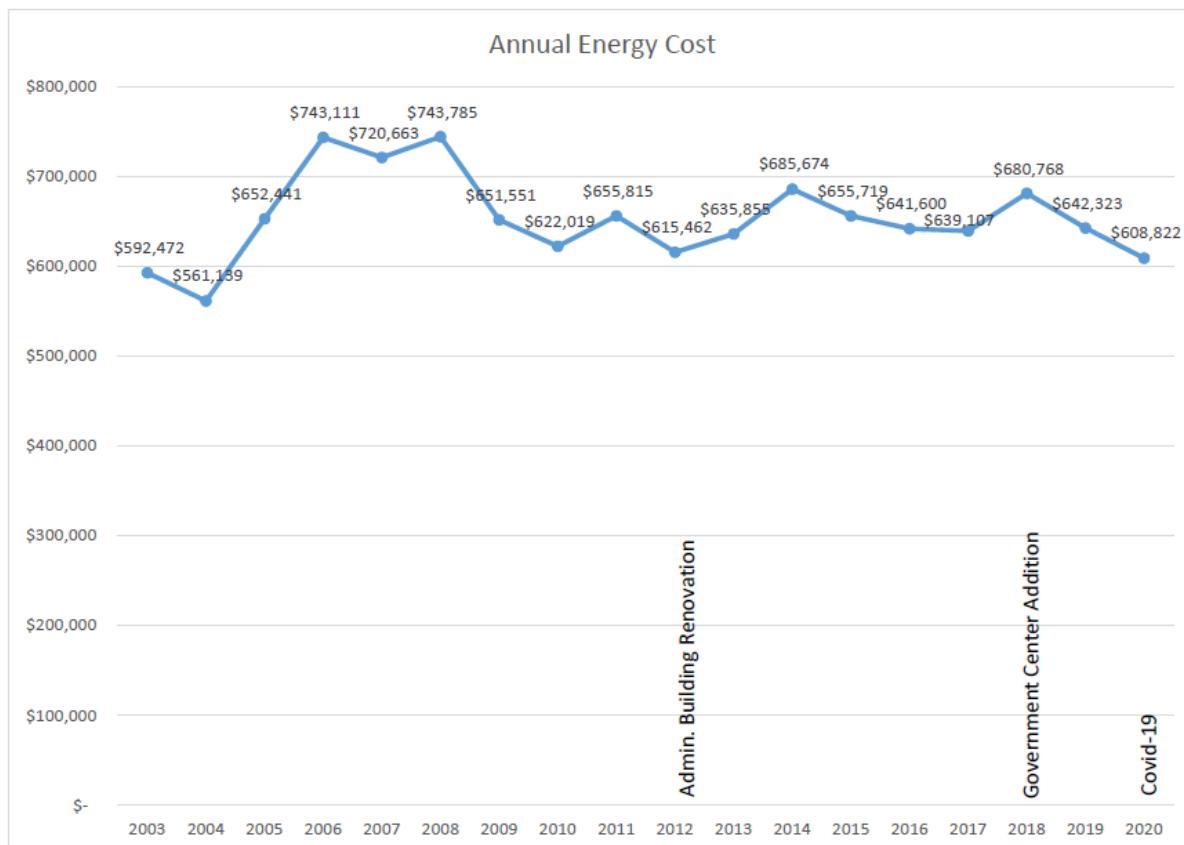


Sustainability/Energy Use Update

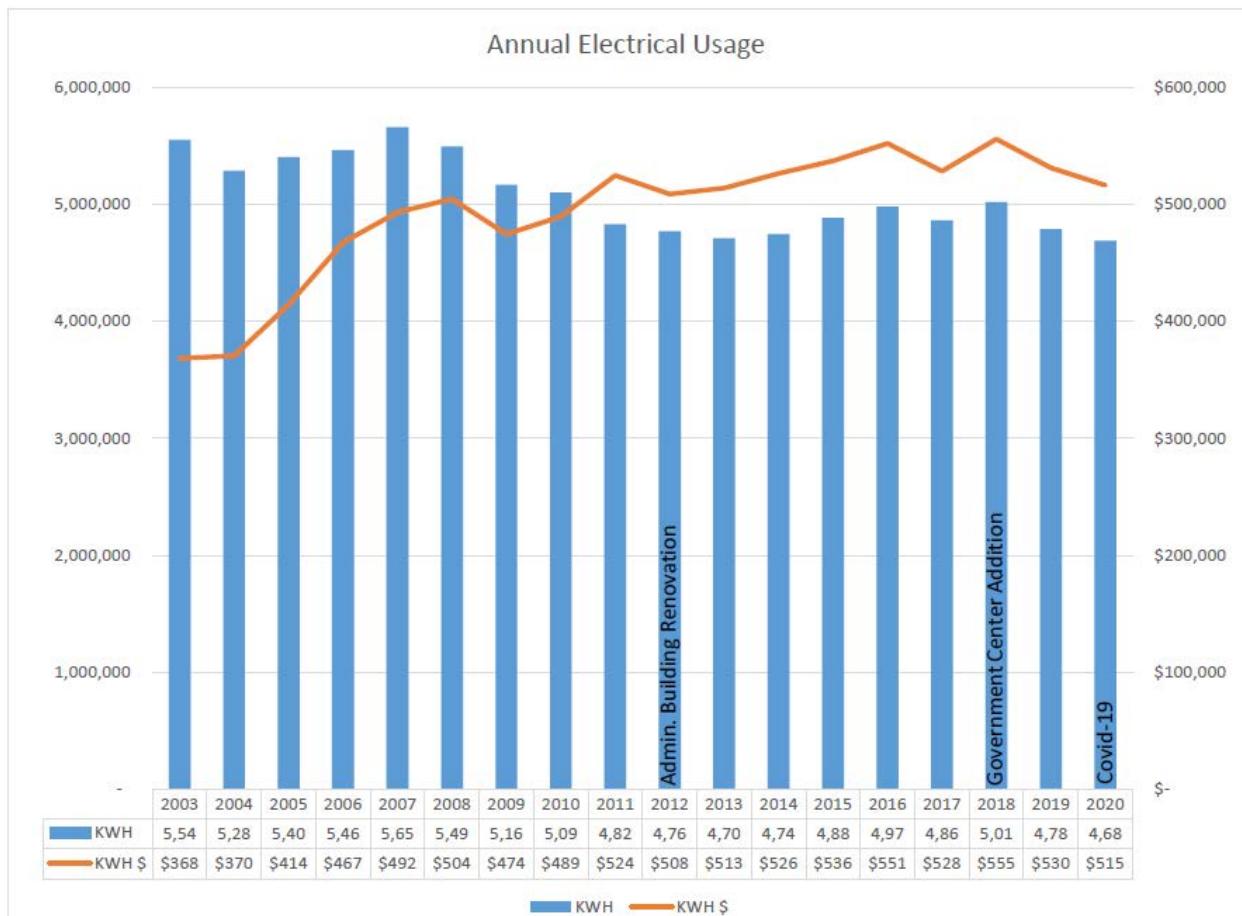
320 S Walnut Street Campus

The following report highlights energy and cost savings from sustainable related projects at the 320 S Walnut Street campus consisting of the Justice Center, Administration Building, North and South buildings and the new Government Center Building.

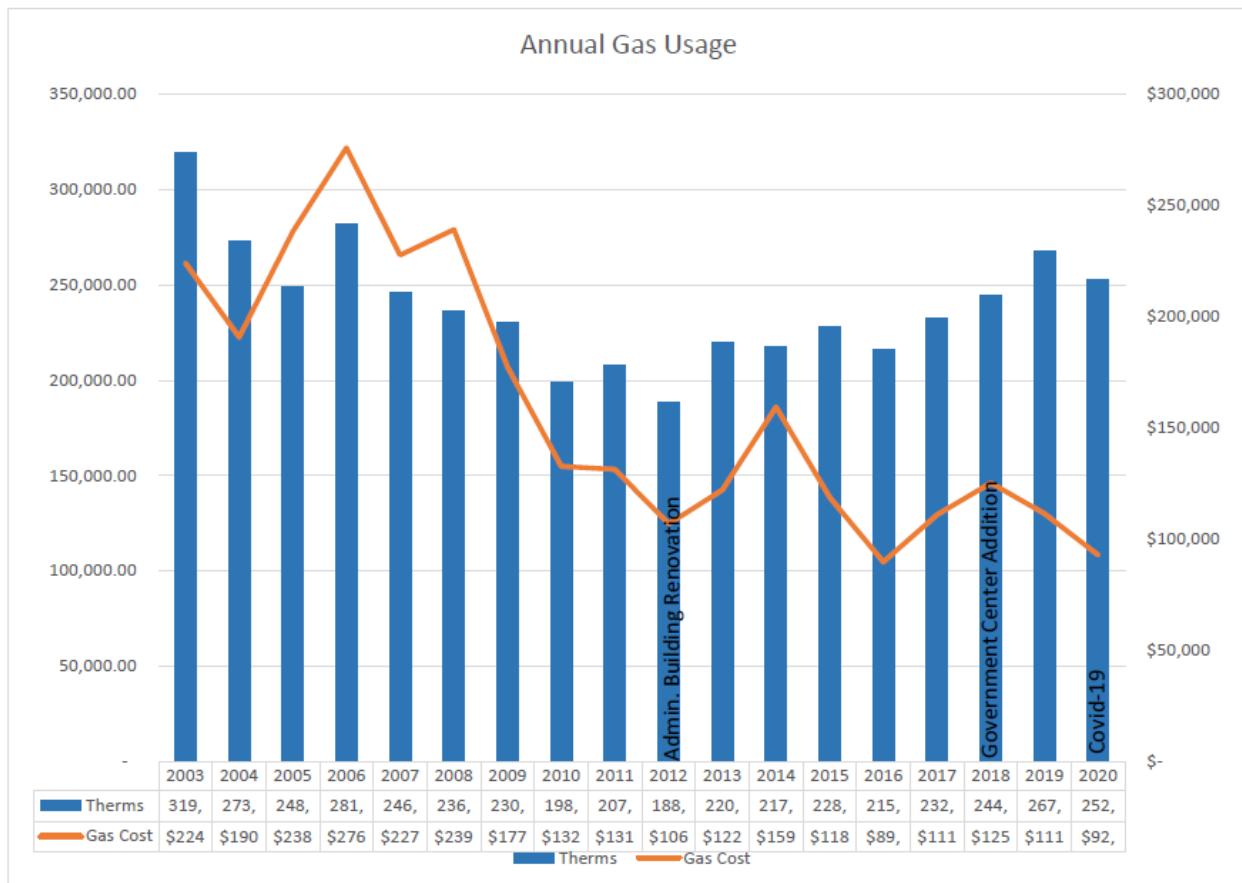
Sustainable efforts by the County have proven beneficial in reducing consumption and cost of electric and natural gas utilities. As shown by the following graph, our annual combined energy cost has remained fairly consistent over the last several years and has decreased from the mid-2000s. Higher electrical KWH costs and exceptionally low gas per therm costs have been a factor in keeping these numbers relatively level. Energy usage reduction measures and very low increase in energy consumption even as we added employees and increased building space with the addition of our new Government Center also played a significant role. McMahons 2016 estimates for energy costs in office spaces in our region was \$2.72 per square foot while our actual costs have been just under \$2.00 per square foot. Using those numbers, we would have expected our new 100,000 square foot Government Center building to add an annual energy cost of \$200,000 to \$272,000+ per year starting in 2018. As shown by the below chart, the actual realized energy cost increases were much lower than expected. As a note; we could see future usage and cost increases in years with extreme weather. A recovery in gas prices could also have a large effect on future annual gas costs.



Annual electrical consumption as shown by the blue columns in the below graph has been holding relatively steady or even decreasing as we added employees and building space throughout the years. 2019 usage is down compared to the mid-2000s even after the addition of our new 100,000 square foot Government Center. Annual electrical costs (orange line) has steadily gone up over the years due to inflationary price increases per KWH, however we have been able to keep electrical cost fairly steady in recent years by reducing usage. Key factors included the renovation of the Admin building and the addition of the energy recovery units in 2012-2013. Central chiller and boiler plants, HVAC upgrades and LED lighting helped to keep electrical cost almost steady, even with the addition of the new Government Center in 2018. To put the graph in perspective, the campus used 872,484 KWH's less in 2019 than it used in 2007. These savings were enough to both power our new Government Center and also saved additional power equivalent to removing 102 average Wisconsin households from the electrical grid. (ie.gov lists average annual Wisconsin household consumption at 8,500 KWH). Ongoing lighting upgrades over the next couple of years will also help to further reduce consumption.



Gas usage is up slightly due to the addition of the new Government Center, however annual gas cost as shown by the orange line is down significantly over the last several years due to the low per therm price of gas. The creation of a shared or centralized boiler plant during the addition of the new Government Center in 2018 helped in keeping gas usage increase minimal. The Justice Centers original 1991 boilers were used for the 2018 central boiler plant. These boilers are approximately 80% efficient and have approximately 7 to 10 years of usable service life remaining. At the end of their service life these boilers can be replaced with 95% efficient boilers which will create further savings at that time. As a note; a full recovery in gas prices would increase the annual operating budget by \$100,000 to \$150,000.



Major sustainable achievements that have contributed to the current energy reductions to date include the creation of central/shared boiler and chiller plants, high efficiency HVAC equipment and controls including the use of enthalpy controls, inverters on pumps and fan motors, energy wheels in the Justice Center, efficient building design and updated lighting throughout select areas of the campus.

Ongoing and future sustainable objectives include the following:

- Continue retrofitting fluorescent bulb fixtures to LED bulb fixtures. We currently have nearly half of our estimated 10,000 bulbs converted to LED bulbs. New LED bulbs cost approximately \$4 each to purchase but will save \$55 to \$95 in electrical costs over the 50,000 hour rated life of the bulb depending on the wattage of the bulb that is being replacing. This is a time consuming project as the ballasts needs to be removed from each fixture and each fixture's wiring needs to be reconfigured for the new LED bulbs.
- Future project of updating the Justice Center boilers to higher efficiency boilers. This would likely be done after the end of life of the existing boilers, however could be done sooner if there were a significant increase in gas prices or if the government started to levy carbon charges for stack emissions. As a note, this is the first year the DNR has asked for an emissions report for our boiler stacks.
- Study feasibility and perform cost benefit analysis to install solar panels on roof of the North building. Rebates or grants could possible become more readily available with the new federal government administration.