

# Rubenstein School Building Energy Use After Efficiency Upgrades

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One of the Rubenstein School's goals is to minimize its footprint on the environment in as many ways as possible. The largest project to help reach this goal was the reconstruction of the Aiken Center, completed in 2012. However, Aiken is not the only Rubenstein School building on campus that has taken steps towards more efficient operation. Various upgrades, ranging from switching to LED lightbulbs to installing energy efficient furnaces,

have helped reduce several buildings' overall usage. Under the leadership of Gary Hawley, in the class Greening of Rubenstein, students are assigned various projects that help take steps to a more sustainable campus.

The Rubenstein School is one of the few colleges on campus that takes time, and money, to invest into making its buildings as efficient as possible. Our group has decided to compile and analyze data to see how the upgrades that have been installed in previous years are working. With the help of Gary Hawley, Freshman Environmental Sciences major Travis Miller, Sophomore Environmental Sciences major Shelby Long, Burlington Electric, and University of Vermont's energy consultants, we are able to collect data on the Rubenstein School's buildings total energy and natural gas usage for the years spanning before and after the renovation of Aiken.

It is our goal to compile this data into clear and concise graphs to be displayed in Aiken for the whole UVM community to see. By summarizing the energy and natural gas usage of each building over the course of years prior and post upgrades, we can determine if the steps we are taking towards a more sustainable campus are paying off.

As some may know, the energy usage of the new Aiken building has started to creep back up beyond levels we are not comfortable with since the renovation project. The first step in determining why this is the case is to analyze trends throughout the years, taking into account certain seasons, efficiency upgrades, and building activity, to determine what needs to change to get Aiken back on track to reducing its overall footprint on the environment.

More important than dwelling on what has happened, we are using this clear representation of the total usage of the Rubenstein School buildings to determine and prove that the time and money that faculty, students, and utility companies have invested in upgrading our buildings is helping to reduce the overall energy and natural gas usage. On top of proving that our buildings are indeed running more efficiently than before efficiency upgrades, we are using this project as a way to educate others within the School, UVM, and the greater Burlington community on what specific changes can be made to ensure that buildings, commercial or residential, are running at their optimal efficiency. A good example of the increase in efficiency following upgrades is seen in the above figure that shows that the Bittersweet building averaged about 100,000 kWh of energy use per year prior to upgrades. Following upgrades made in 2014 that included LED lighting, increased insulation, variable speed motors and a new furnace, the building is now using closer to 75,000 kWh of energy per year

