

Electricity and Natural Gas Usage at Trinity College, Hartford, CT

Vanja Babunski '18

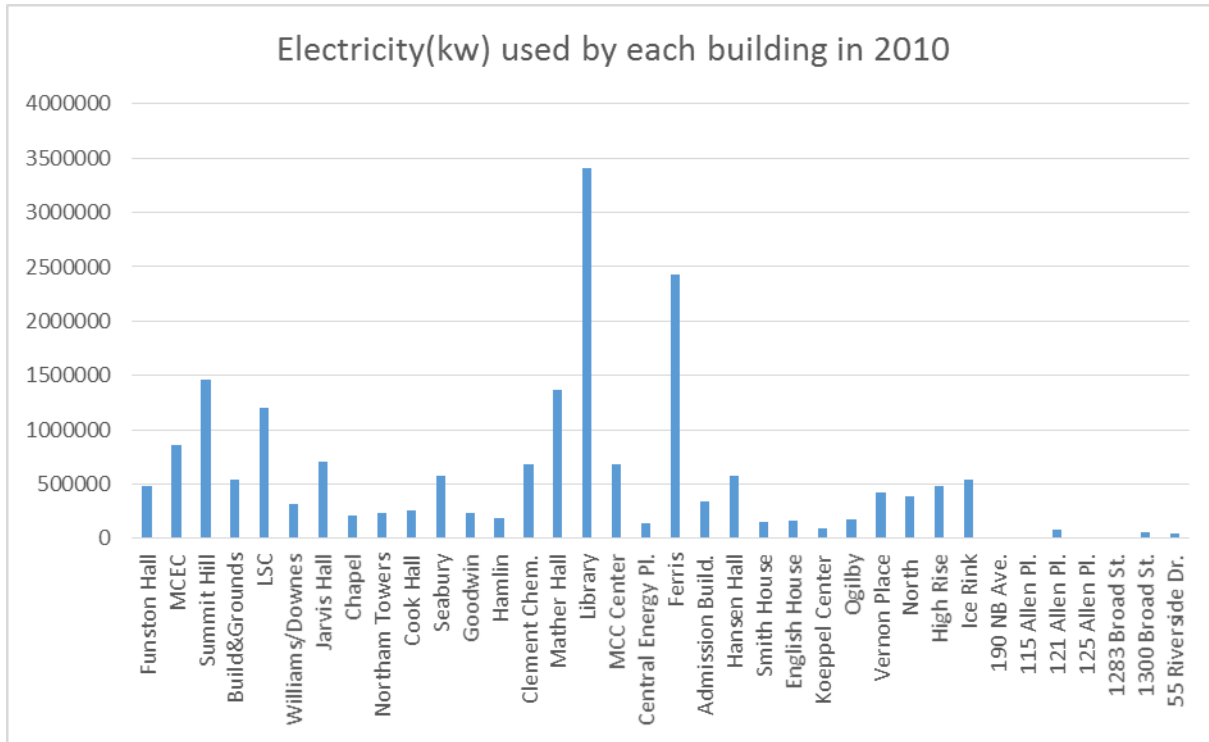
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This semester I was researching about electricity usage, as well as natural gas usage of separate buildings on campus from year 2010 up to the end of 2014. My main focus was to see how much each building is spending on electricity in order to be able to later calculate and explore how we can make that usage more efficient and cost beneficial. Electricity and CNG data were gathered from the bills that Trinity is monthly paying for.

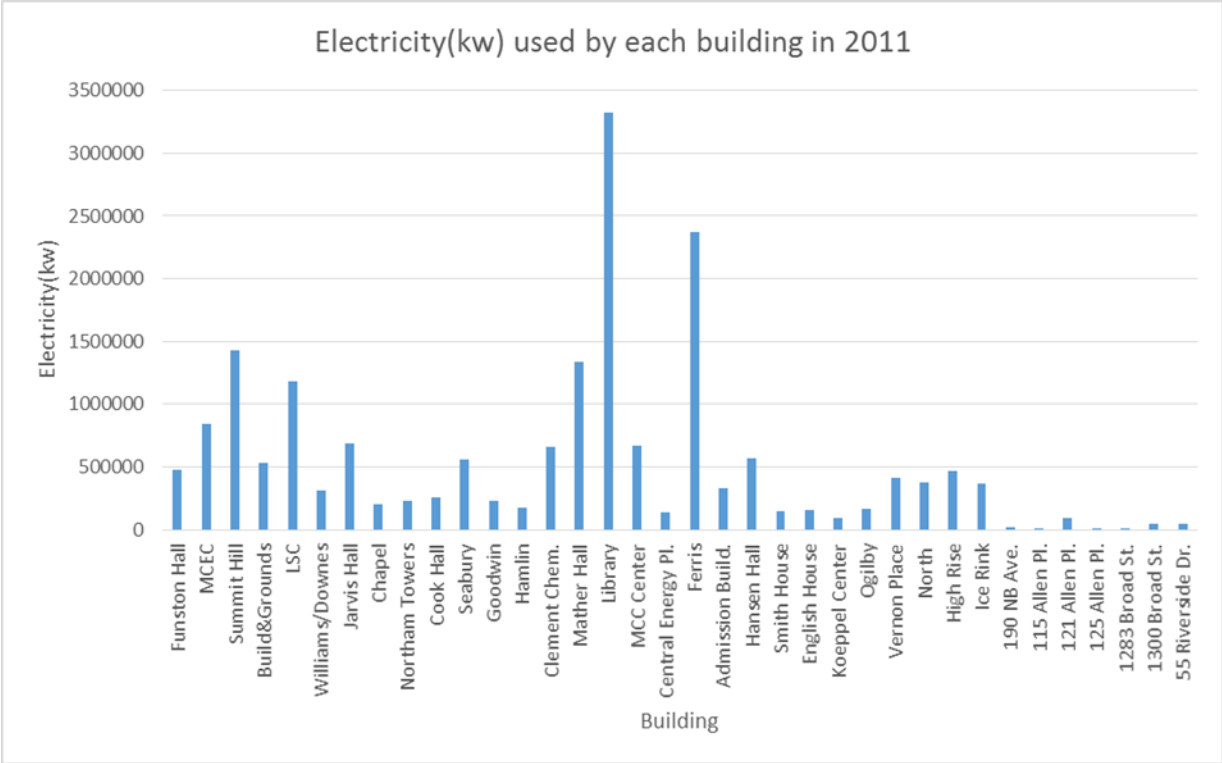
First goal was to obtain how much each building is using and spending on electricity. However, as later was revealed that kind of information is not readily available since many buildings on this campus have consolidated meters. Actually, two primary electric accounts (Meter 1 and North Campus Meter) cover more than 93% of total electricity usage on Trinity campus. Meter 1 is covering twenty buildings in recent five years I have been researching, and as from a couple of months ago in 2015, building Trinity Commons is added to this account, so slight increased changes in electricity usage for Meter 1 are expected to appear in upcoming years. Similar conditions has befall to North Campus Meter, since from also a couple of months ago buildings Board Walk and Park Place have been added to this account. So, from now ten buildings are covered by this meter.

I have taken ten electric accounts into consideration, while doing calculations and making graphs. Two of them are primary, Meter 1 and North Campus Meter (labeled on bills as 300 Summit Street and Vernon Street, respectively), and eight of them are secondary accounts. Total of those ten electric accounts approximately cover more than 97% of the total electricity usage

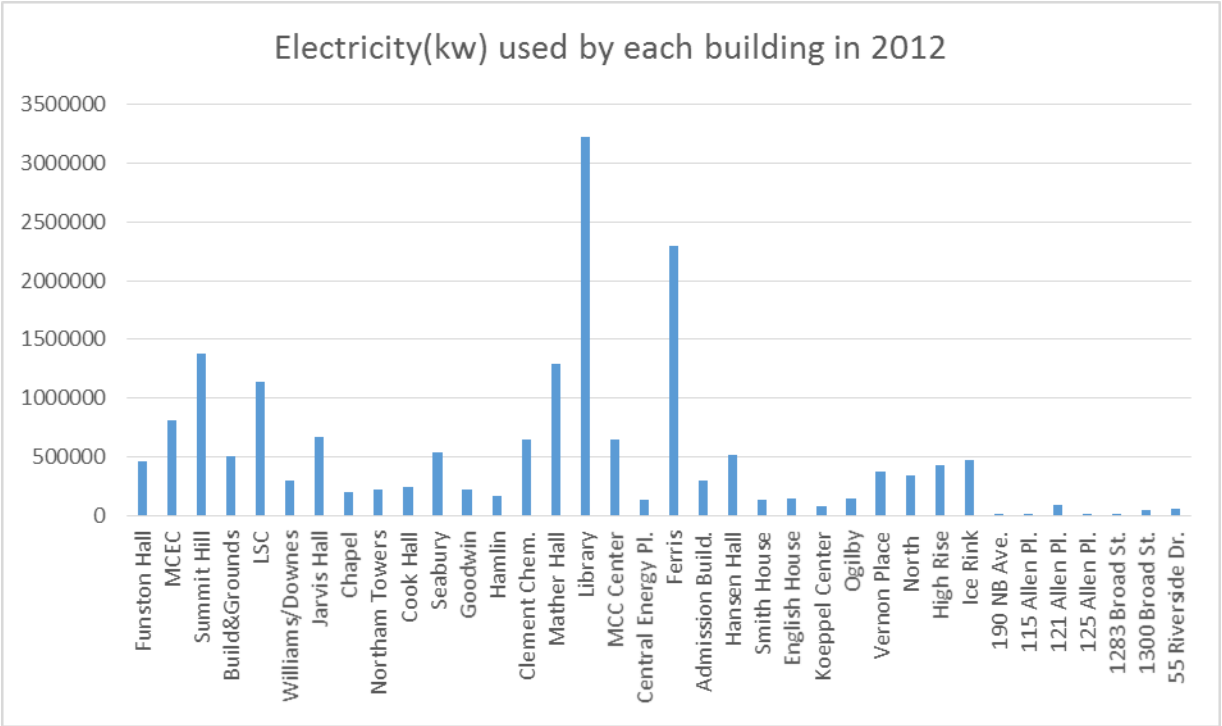
on campus. I have done approximations of electricity consumption of each building, based on Building Report for Energy Module Startups using the actual square footage of each building. Graphs below are representatives of those calculations.



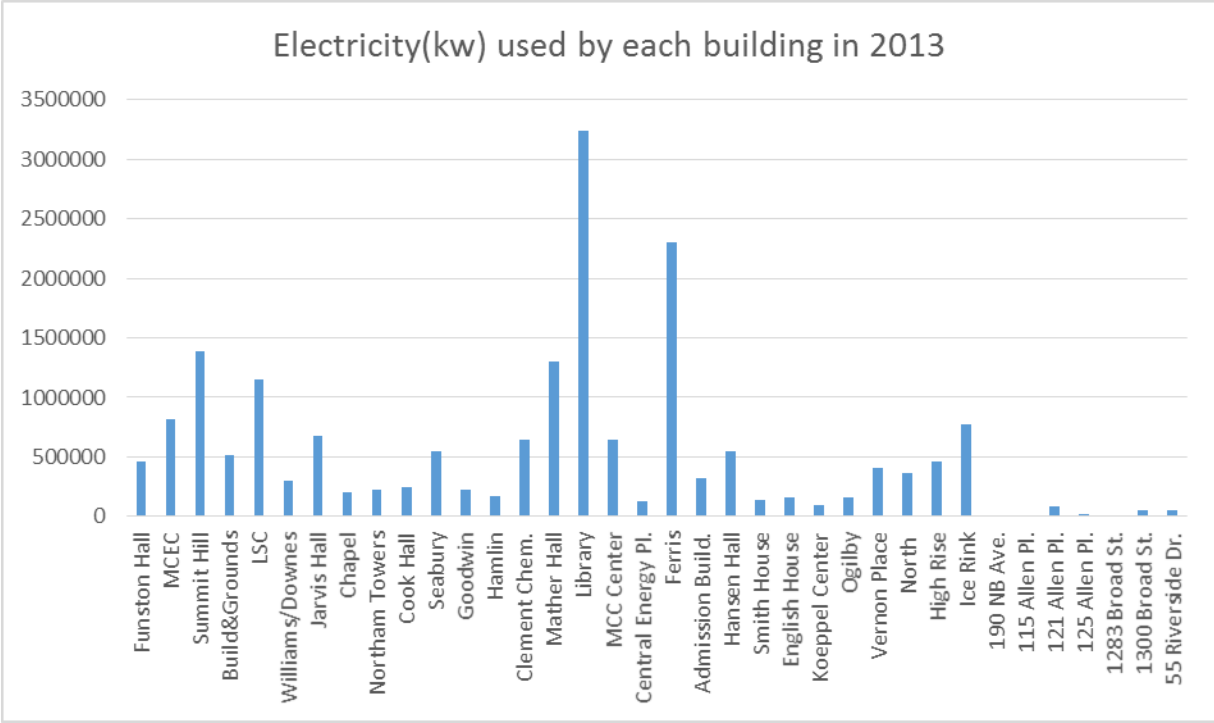
Graph 1. Electricity (presented in kw) used by each building in year 2010.



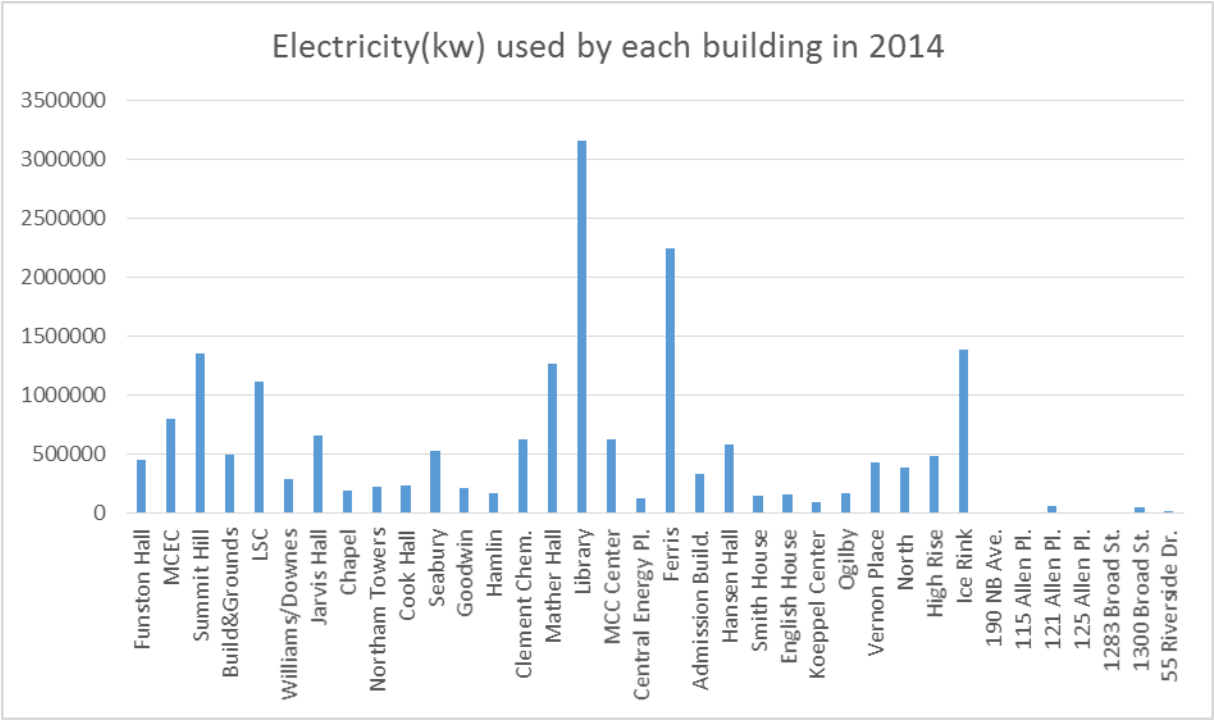
Graph 2. Electricity (presented in kw) used by each building in year 2011.



Graph 3. Electricity (presented in kw) used by each building in year 2012.

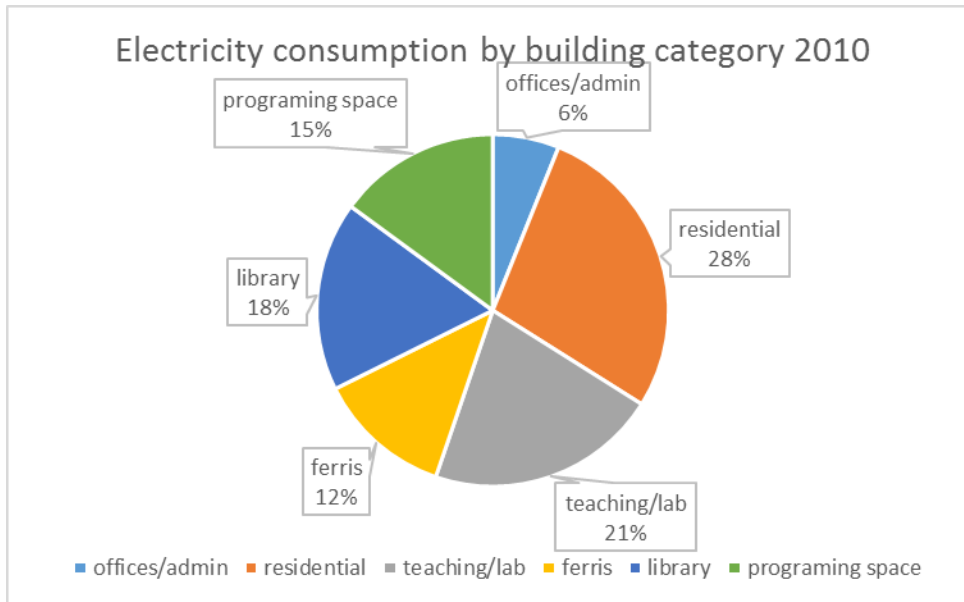


Graph 4. Electricity (presented in kw) used by each building in year 2013.

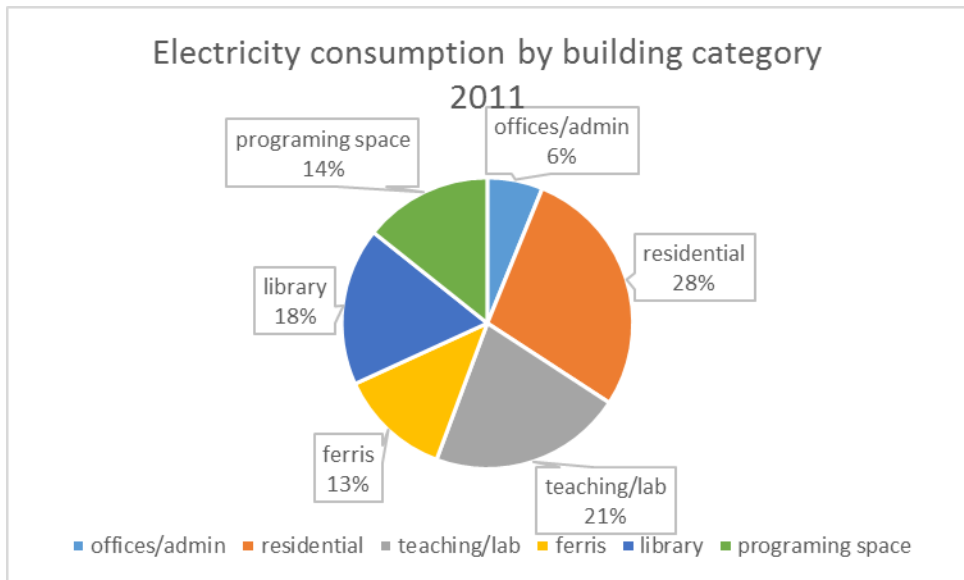


Graph 5. Electricity (presented in kw) used by each building in year 2014.

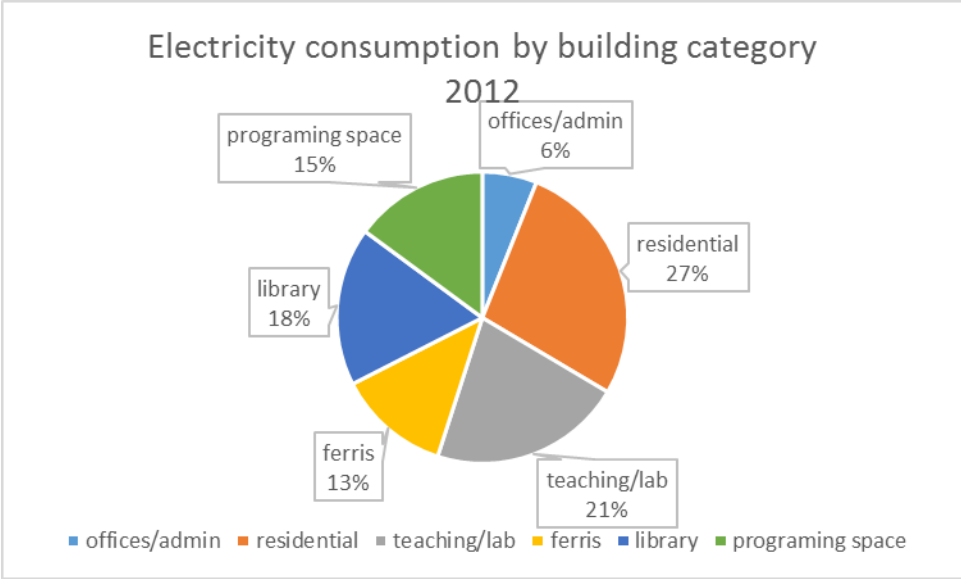
Another type of graph that I have made is electricity usage by each building type on campus. Since there is a number of buildings with different functions on campus, I have grouped them into six major categories: offices/administration, residential, teaching/lab, gym, library, and programing space. Those graphs are shown below.



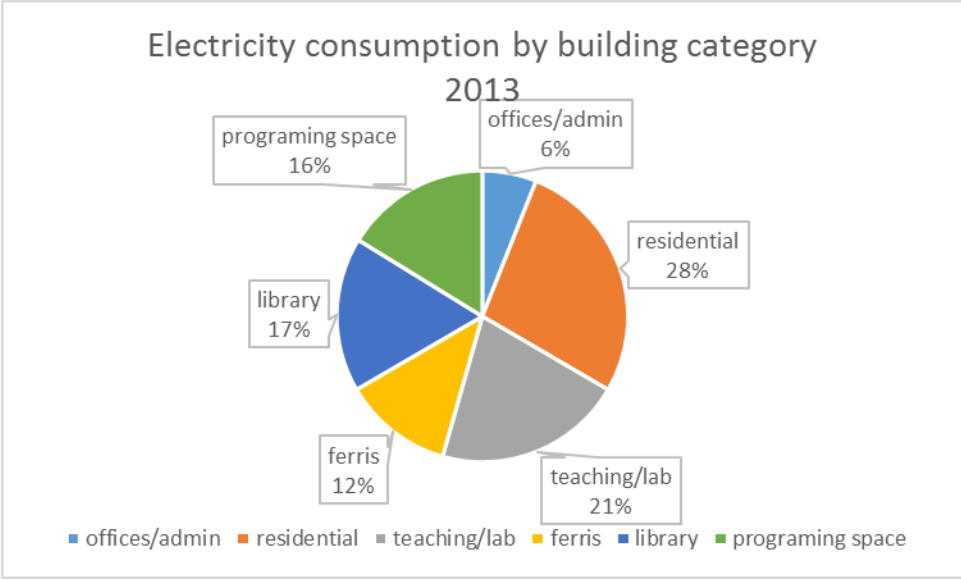
Graph 6. Electricity consumption (presented in kw) by each building category for year 2010.



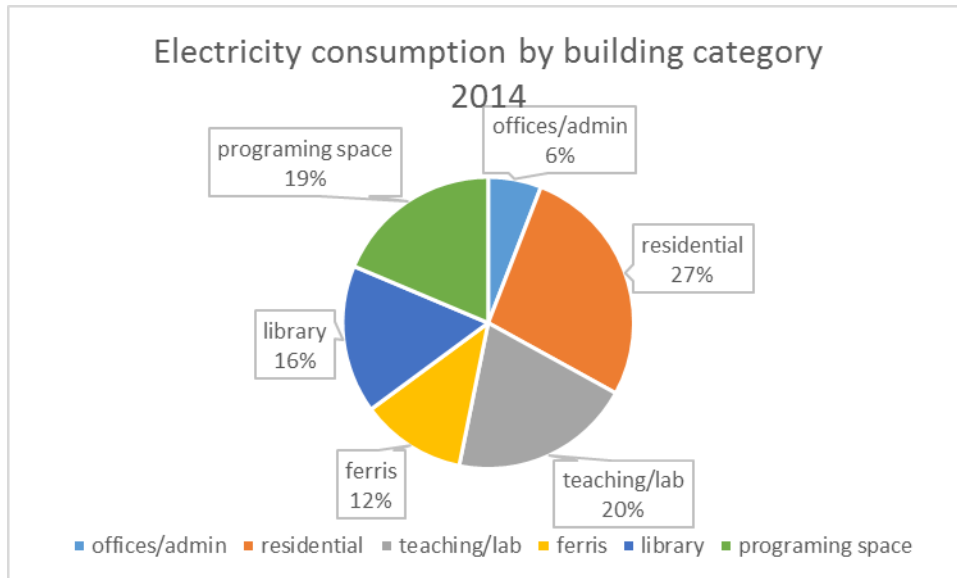
Graph 7. Electricity consumption (presented in kw) by each building category for year 2011.



Graph 8. Electricity consumption (presented in kw) by each building category for year 2012.



Graph 9. Electricity consumption (presented in kw) by each building category for year 2013.



Graph 10. Electricity consumption (presented in kw) by each building category for year 2014.

CNG data was readily available. However, data was not presented by each building usage, but by the total production in the power plant. Trinity has stopped using oil in 2006, and since then it has switched almost completely to natural gas. This heating and cooling system driven by the Central Energy Plant is relatively complex. It is consisted from boilers and chillers, which turn on once a year each and that is how water in two-pipe system is being heated and cooled down. Data CNG usage was readily available for each year, however calculations on how much each building is using could not be made since the square footage or any other kind of variable is not able to provide reliable approximations.

The major issue that I have faced during this semester was availability of the data. At the end, I have obtained all the electricity data that I was looking for, however data was not that easily accessible. For the future work, I think we should concentrate on compiling and rearranging the data we have in a manner that is easily understandable for the public, as well as easily accessible. That is what some highly prestigious institutions, such as Yale University, have

been doing in order to promote sustainable activities. And that is one of the things that is able to foster Trinity College as an institution that seeks for sustainability. This is the picture every institution wants to provide about itself in this modern world. Moreover, this type of data are necessary for making any kind of future energy efficient and cost beneficial calculations, plans, or projects at Trinity College.