

April 8, 2011

Everyone,

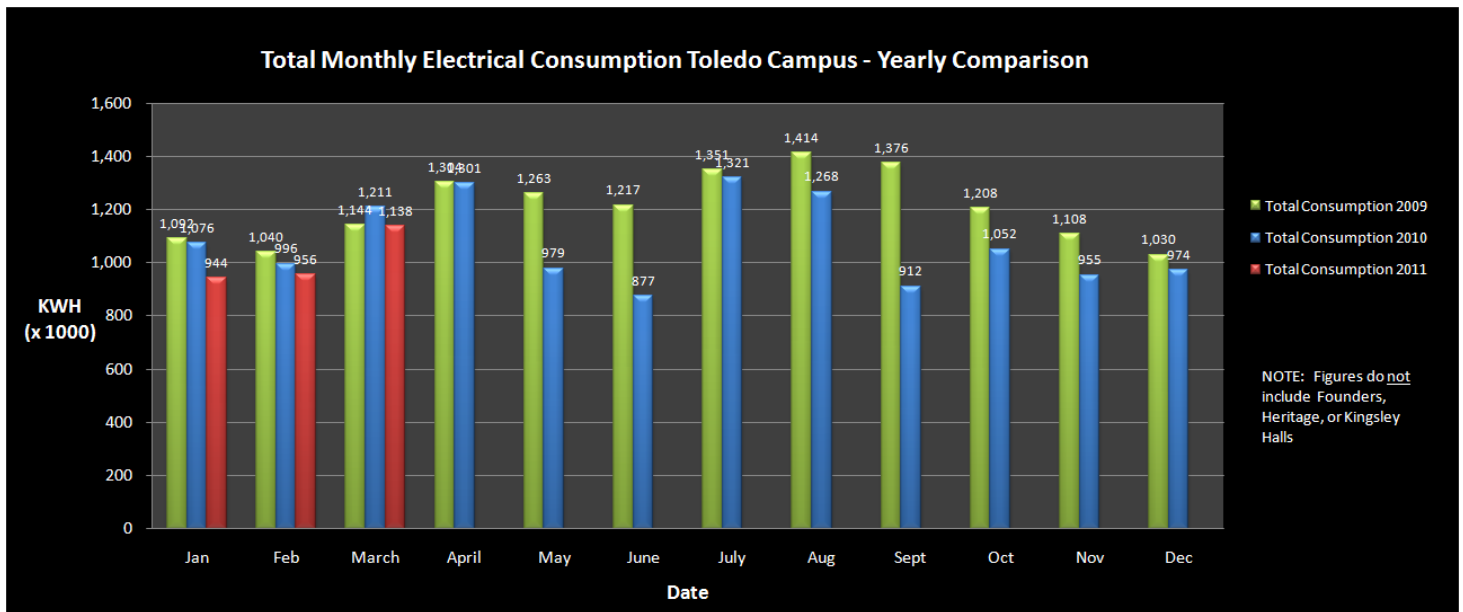
Main Green Link on Owens Website

We had another meeting of the committee working on organizing the Owens green link and Michelle Dockins is getting additional input from Tom Horrall regarding what additional green content to put on the various sub-links under the main green link. Marketing, as I understand it, is also working on a green logo for the links.

I'll keep you posted.

Electrical Energy Usage on Campus

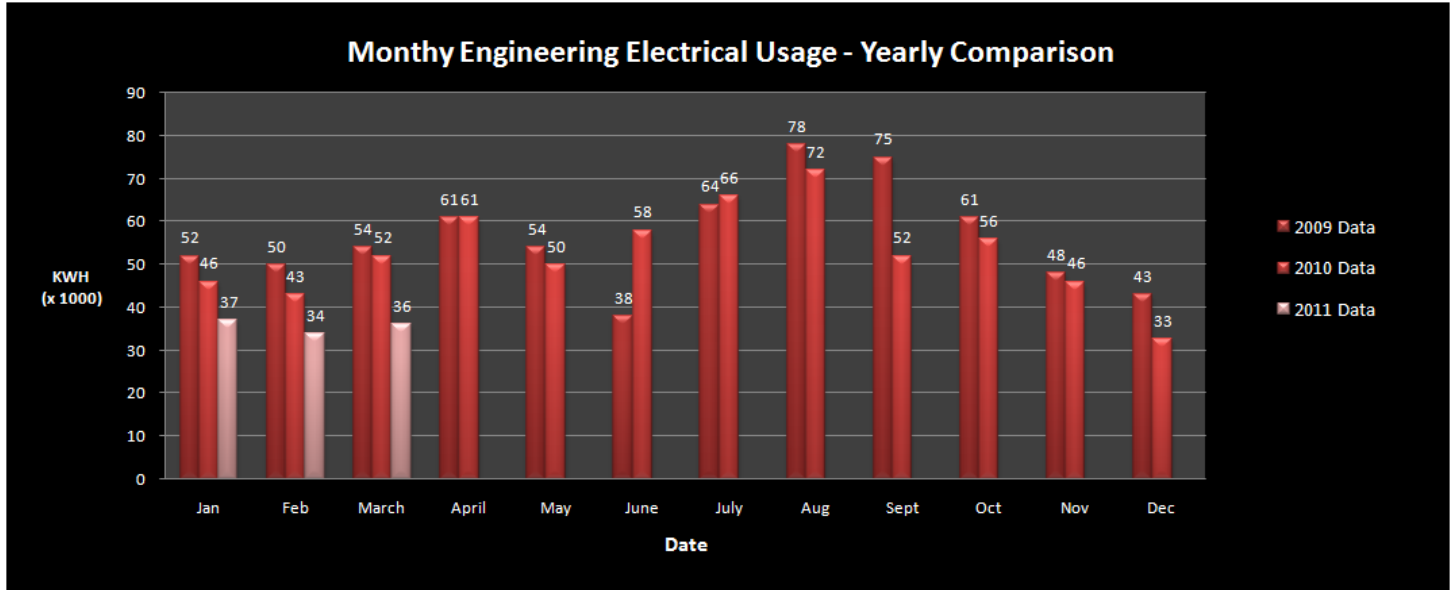
As promised, here is total campus usage for the first quarter of 2011, compared to previous year's data. The energy work by ESG is very evident month by month, especially now when all the tweaking of systems is about complete: For the quarter, we used **8% less** electricity than a year ago. To put that figure into perspective, that amount of energy is equal to the **annual electrical needs of about 17 homes!**



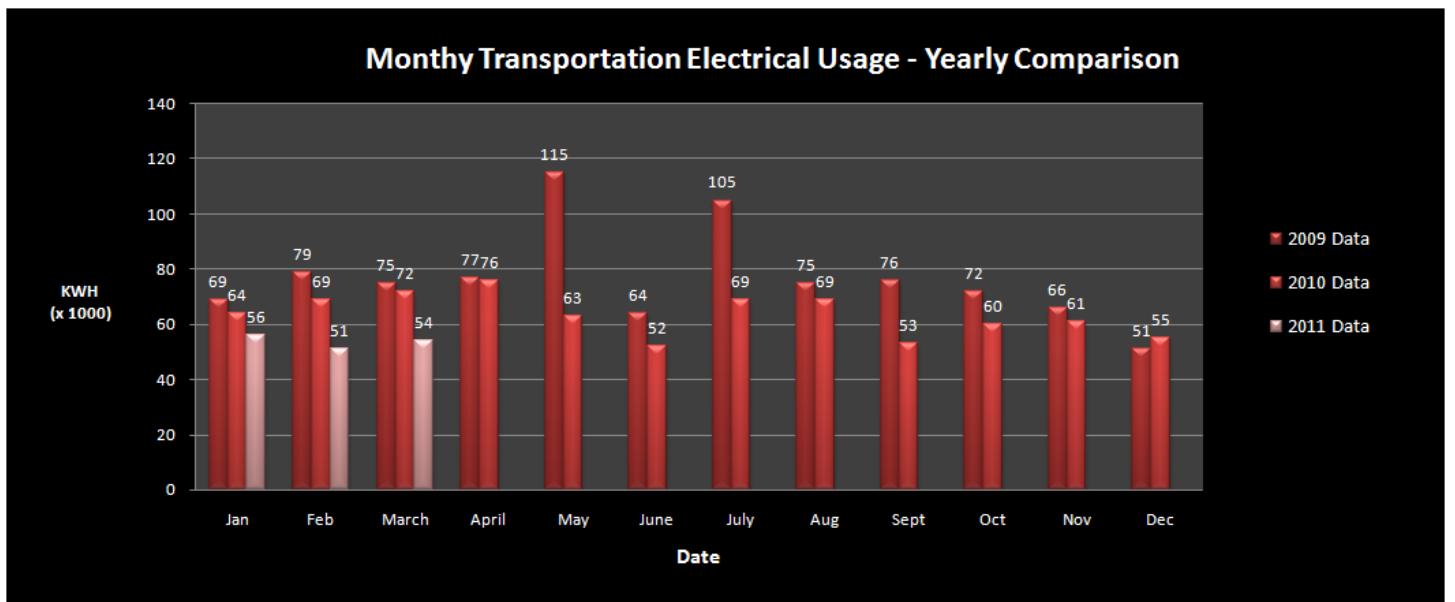
Note: February's data was truncated because CSO was switching over to a new data display. Consequently, data was only collected for 22 days from Feb 7th to Feb 28th. Therefore, I averaged the usage for those 22 days, then multiplied that average/day times the 6 days we were missing data from, and added that to the original total. . . to get an extrapolated, reasonable value for what February's usage should have been. It's a sound and logical calculation to get a fairly accurate, but approximate value. After looking at all the building's data, this value fits the usage pattern.

The next few pages illustrate the savings in the first quarter for all the buildings on the east side of Toledo campus. Next week I will show the west side buildings.

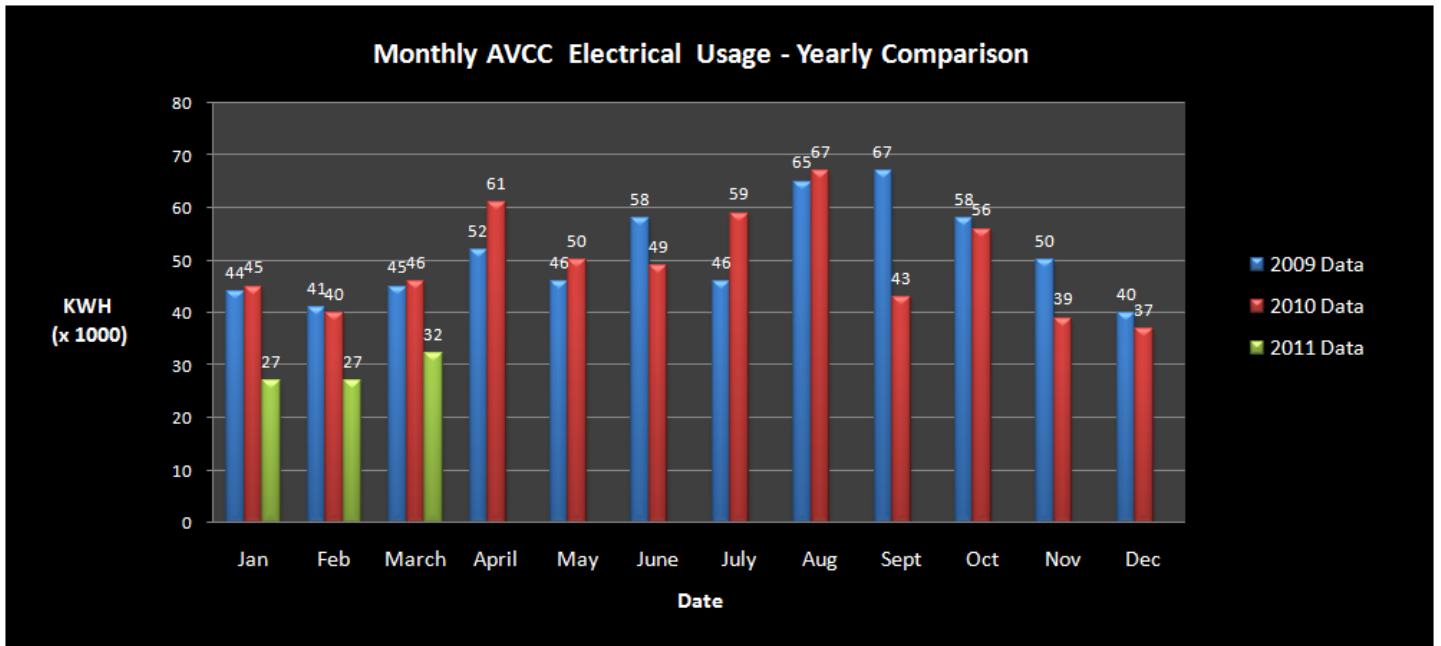
The Engineering building continues to show lower usage as more and more of the energy-saving work is being completed. This building was not included in the ESG contract and is being done internally, which is taking longer, but progress is being made, and is evident below:



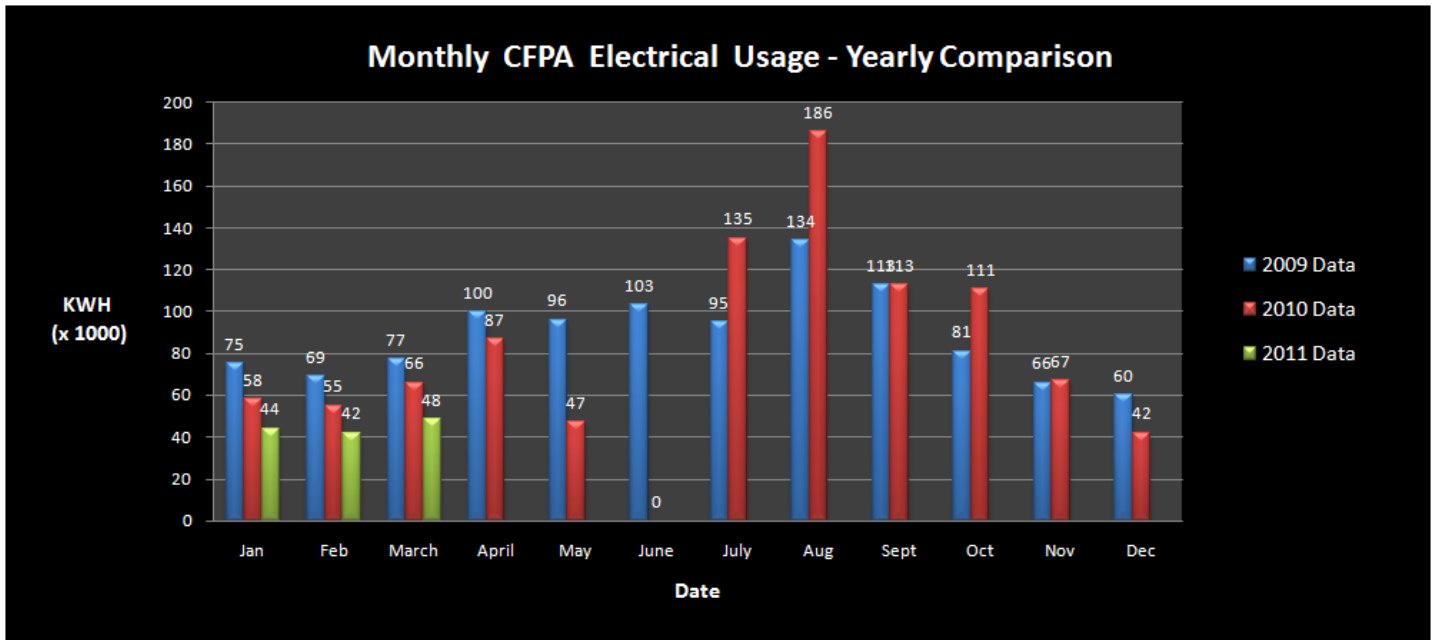
Likewise, Transportation continues to show a downward trend. Though somewhat up in March, none-the-less the trend is significantly downward from last year.



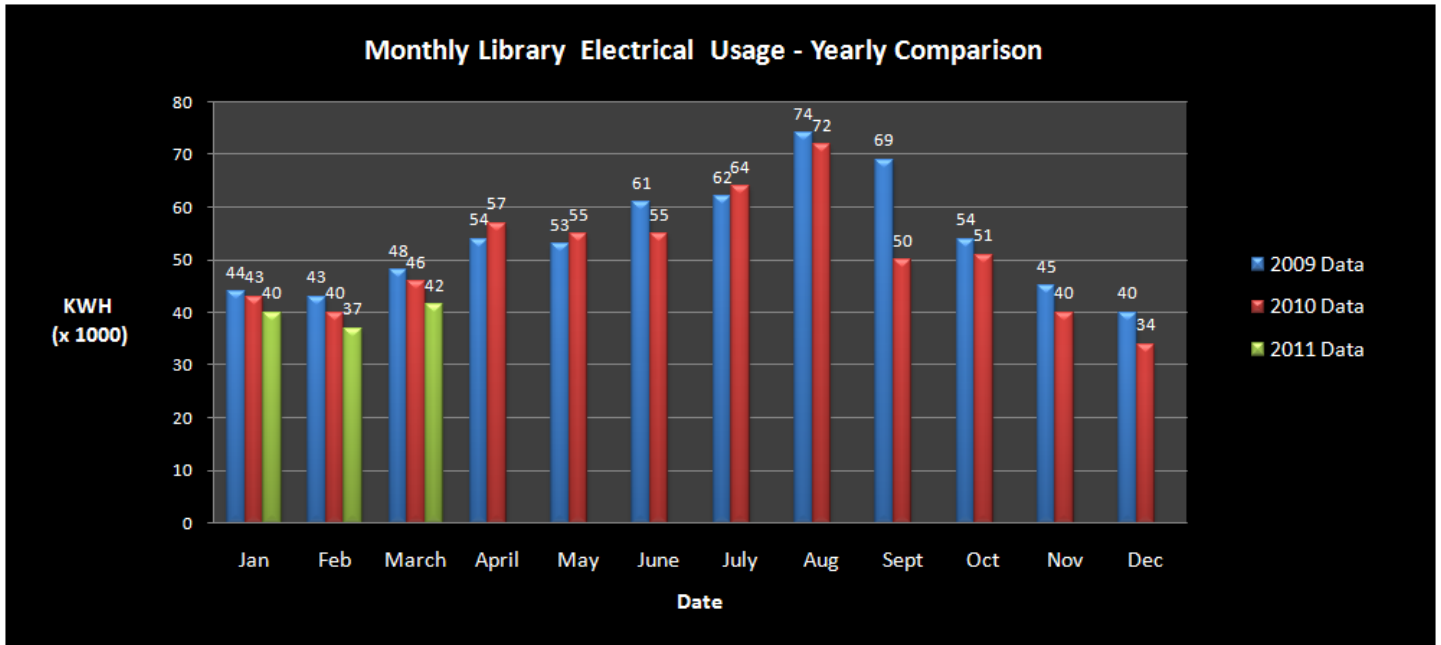
The AVCC showed dramatic drops from last year and though March again was up, the next few months should show a similar dramatic drop as the systems continue to be fine-tuned. It will especially be interesting to see what happens in the hot summer months.



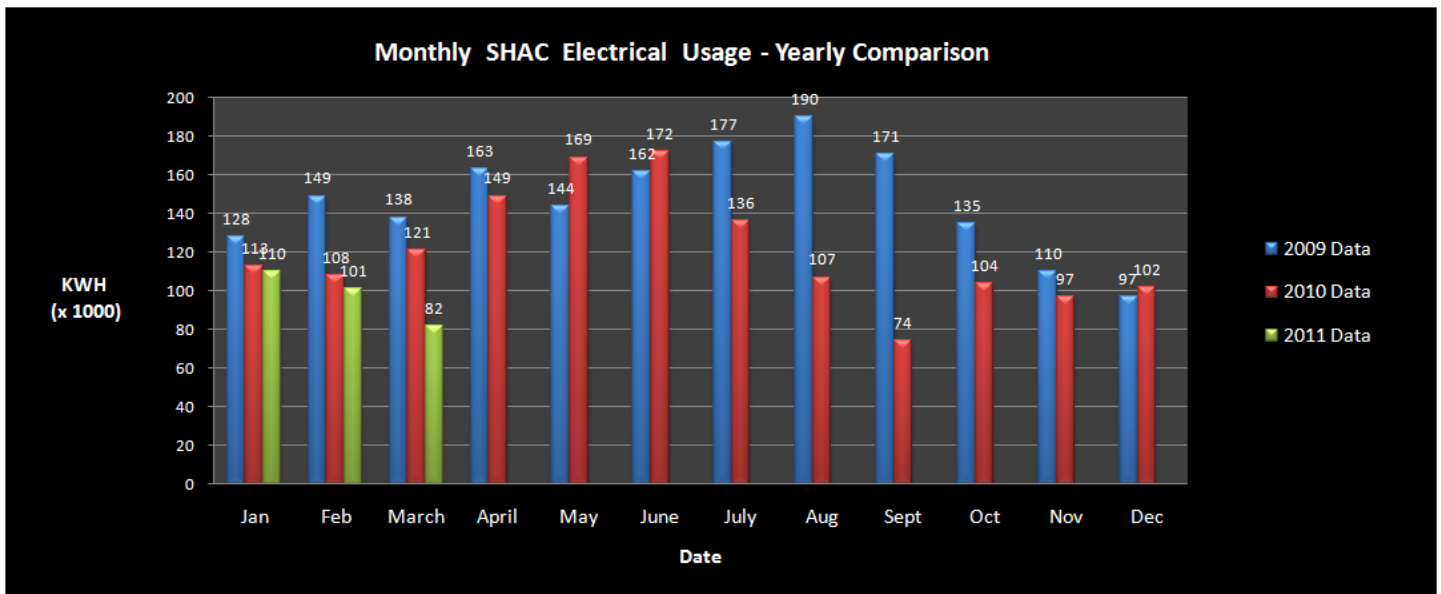
The CFPA also shows a very similar pattern to the AVCC. Not quite as dramatic, but significantly less usage. And again, the summer will tell the tale as to how much savings will be gained.



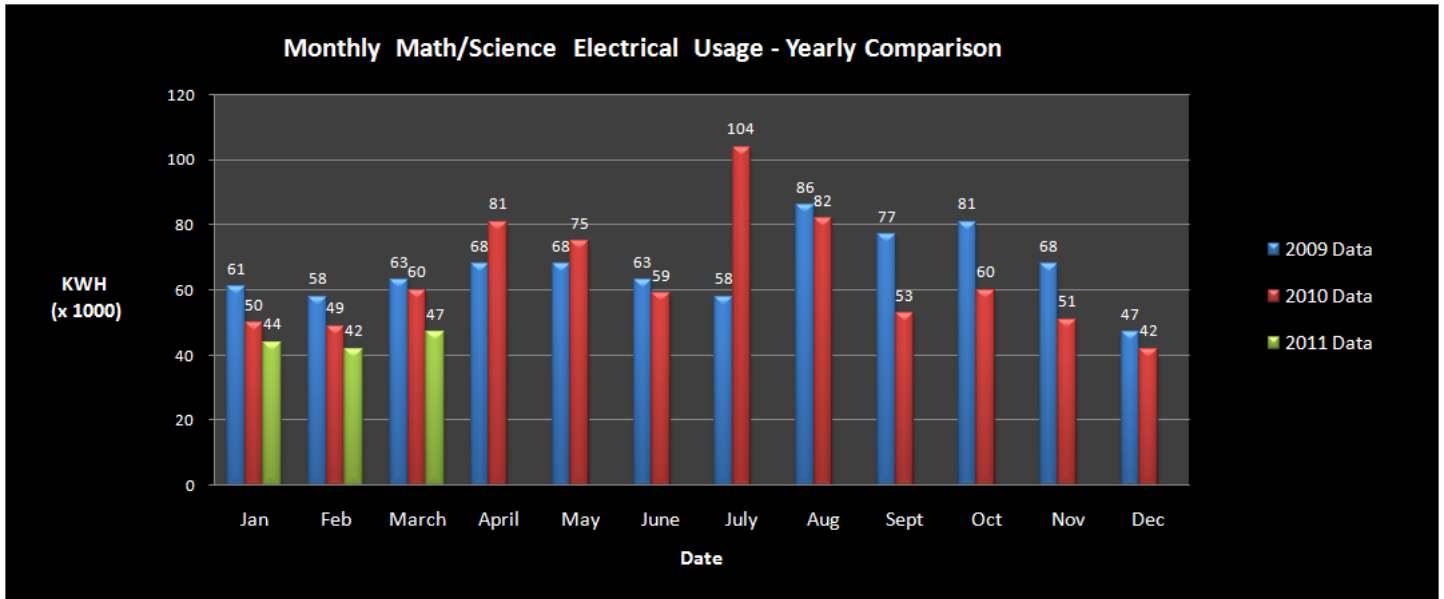
The library shows a similar pattern to the buildings on the previous page. Steady, consistent drops each month. Summer months will tell the tale here too.



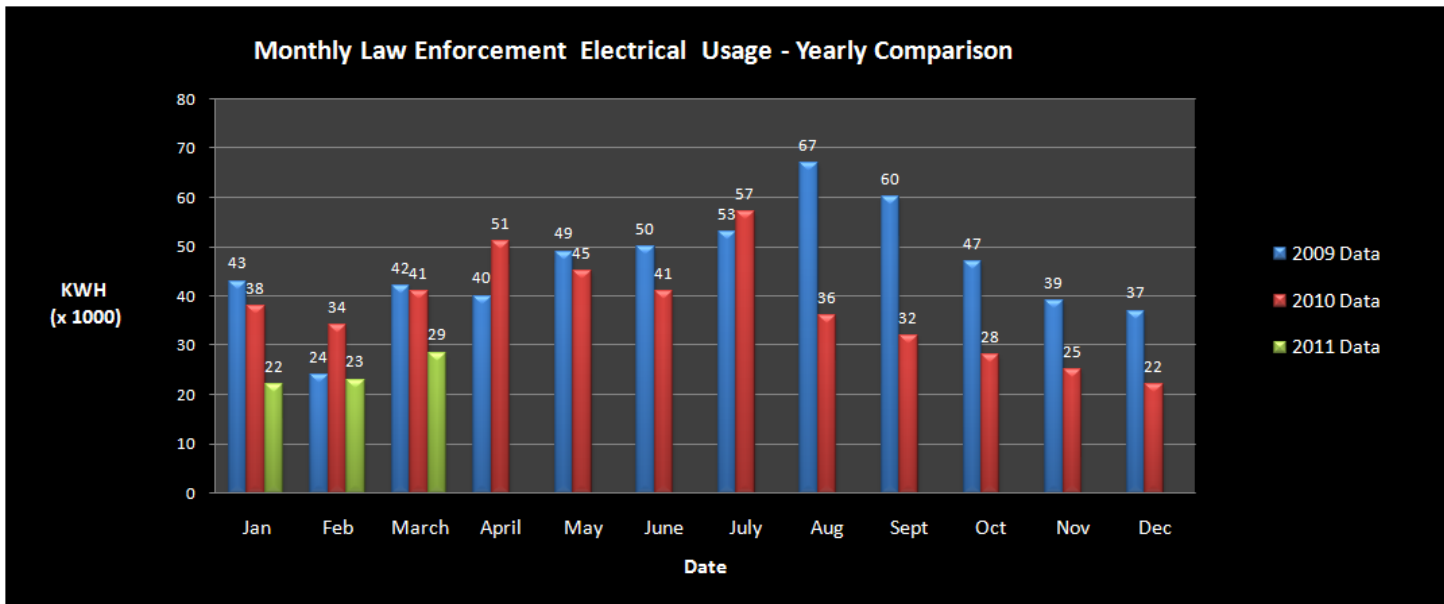
The SHAC is very interesting. Continued drops from last year, but especially last month in March! What will really be of interest is how the summer months will play with the ice tanks taking advantage of off-peak rates. There were dramatic drops from last year during July, August, and September, but I suspect the drops will be even further this year!



Math/Science continues a steady drop as well. Hopefully the spike from last July won't repeat itself!

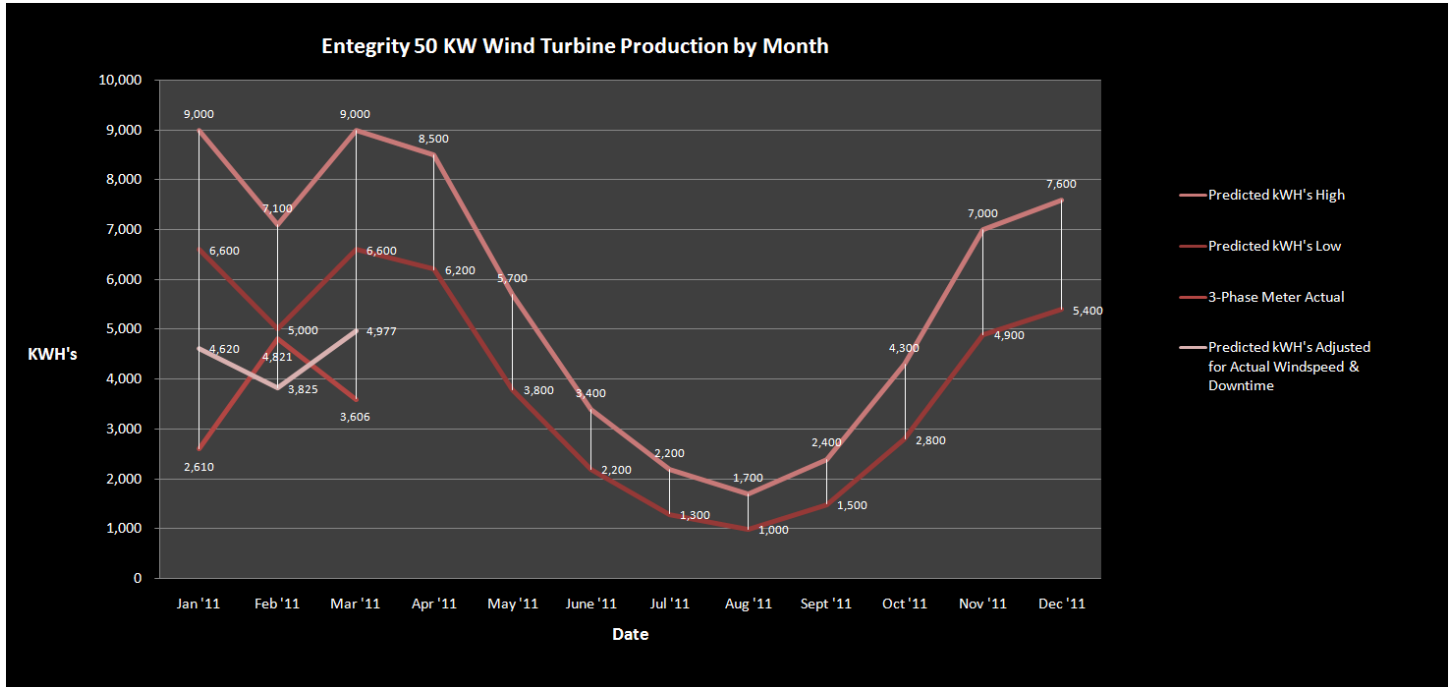


Finally, Law Enforcement is continuing is equally dramatic performance from last year. Quite stunning the last five months of 2010! And the drops starting off already this year show further gains.

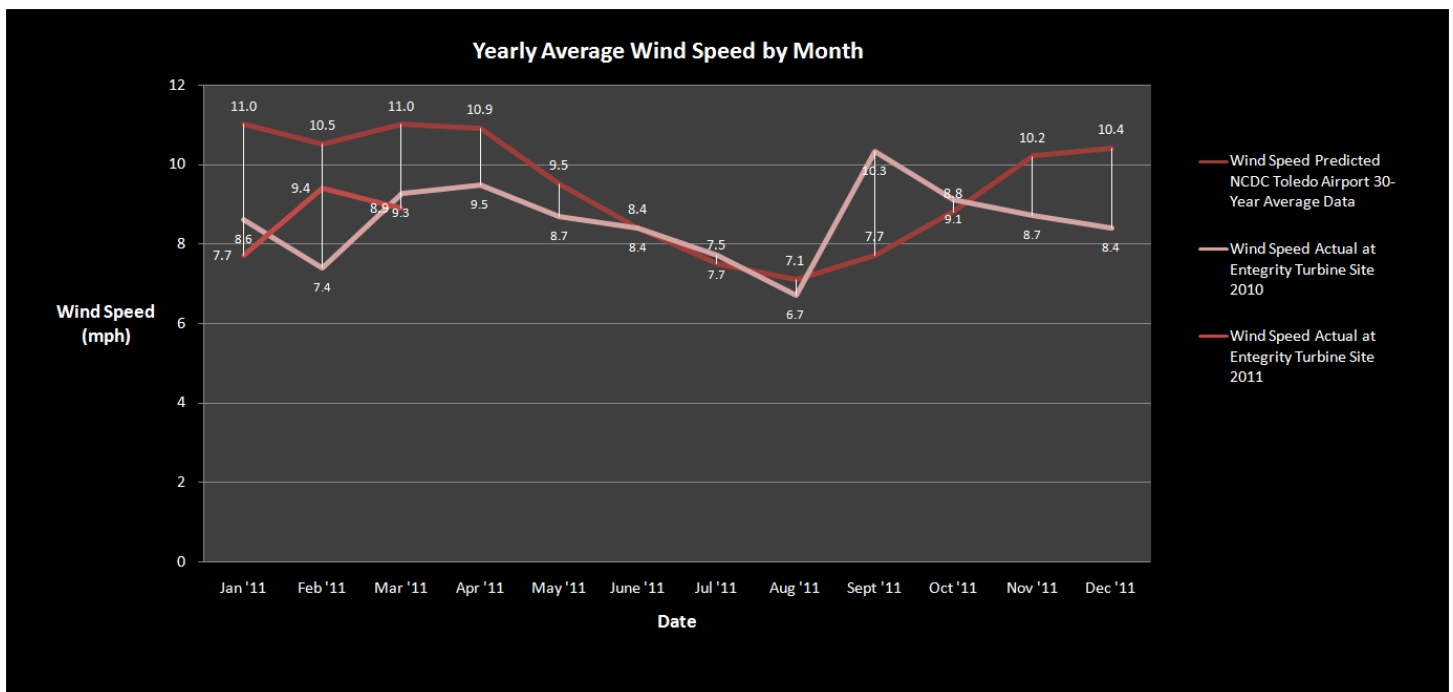


50 kW Entegriy Wind Turbine - Toledo Campus

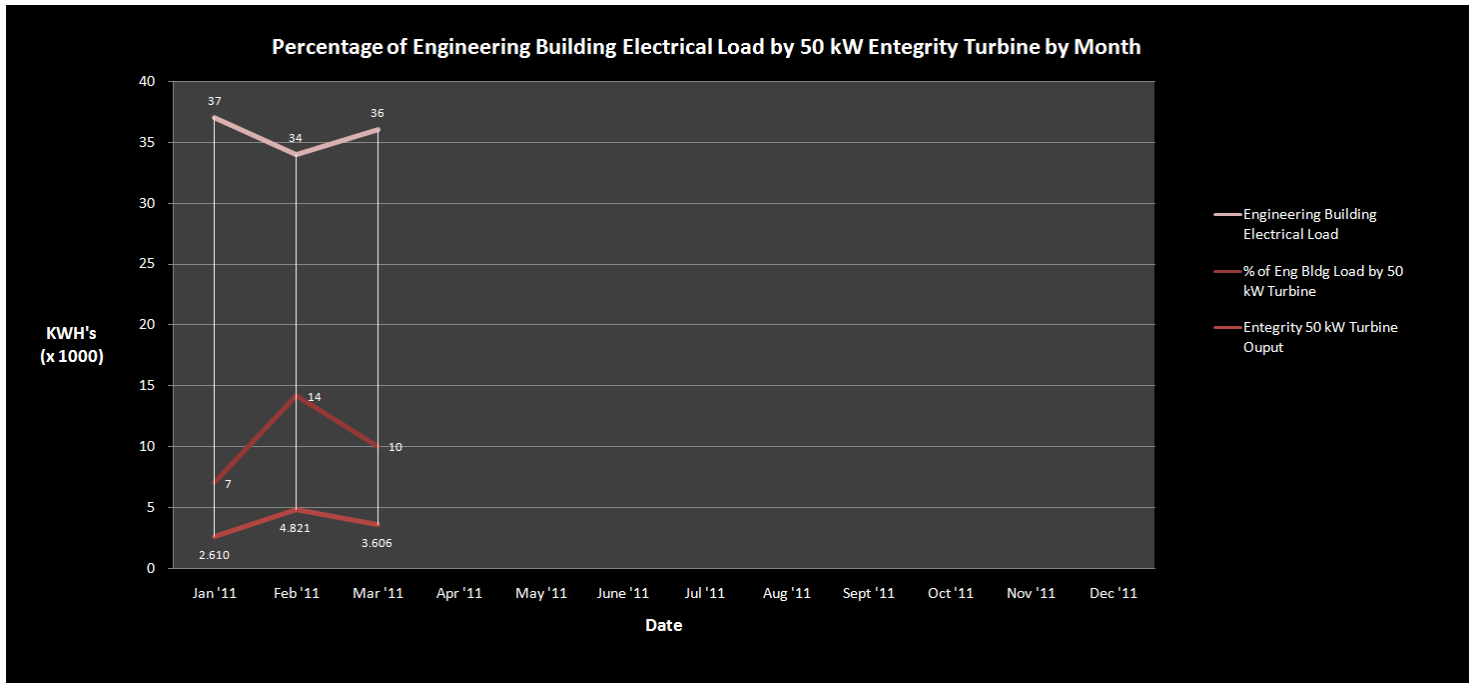
The turbine did not perform well in March, as a result of low wind speeds. As shown below, with **19% less** wind than predicted and with 2 days downtime from a tripped breaker, the predicted amount should have been **4,977 kWh's**. However, the turbine actually produced only **3,606 kWh's**. As has been demonstrated, when the wind speed is close to the 30-year average, the turbine produces what it should. Hopefully, April will be better!



The graph below clearly shows that again, in 2011, we are lower than the 30-year average (**by 19%**), but hopefully an upward trend will continue for the rest of the year!



In this next graph, the percentage that the turbine is contributing to the ET building's electrical load is displayed: It's averaging about **10%/month**, with a high of **14%** in February. I'd like to see that averaging about 15%/month, but it all depends on Mother Nature!



I believe we have finally fixed the plaguing connectivity problems we've had with the Hawkeye data reporting system. Marty Stroud and Ted Swartz of Apterra Technologies (maker of the Hawkeye system) put in a great deal of effort in solving that. It now should be displaying correctly.

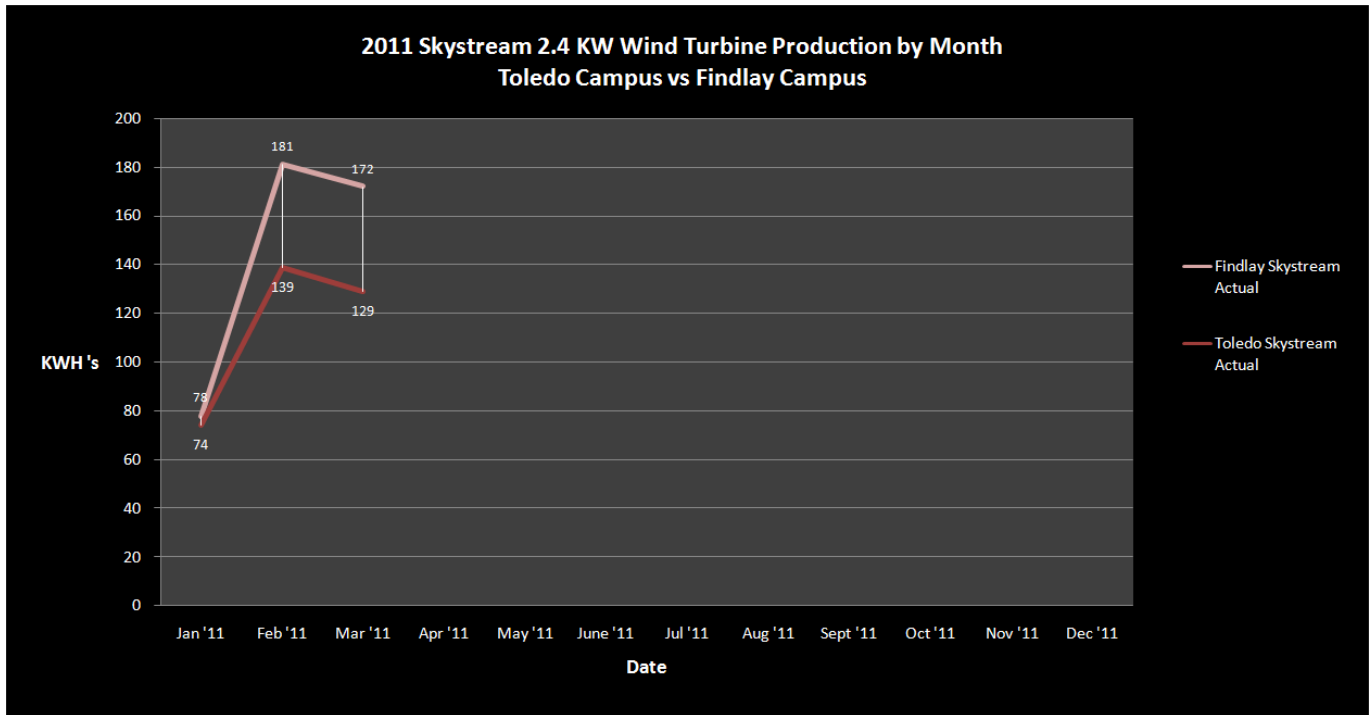
As always, the Dome camera image is best accessed via the Firefox browser to see the live view. For those of you who can see the live camera view, check out the URL below. The "Dashboard" of real-time data is always up and running (as shown in the screen shot above).

<https://www.owens.edu/green/>

There is also a temporary link on the Entegritty page to the Findlay 1.7 kW PV array real-time display as mentioned below.

2.4 kW Skystream Wind Turbine - Toledo Campus

The turbine dropped some this month than last as the graph below illustrates: Production was **10 kWH's less** from **139 to 129 kWH's** and was behind it's Findlay brother by almost **40 kWH's**. (Better siting) Again, I hope the trend continues upward.



2.4 kW Skystream Wind Turbine - Findlay Campus

As shown also on the previous page graph, this turbine dropped only slightly in its production from **181 to 172 kWH's**.

We do now have a live camera image of both the Findlay Skystream and PV array from a dome camera. We are working on getting this image available in a link as was done with the Entegrity link up here in Toledo. Updated software for this camera is still expected to be installed early this month and will help in its operations.

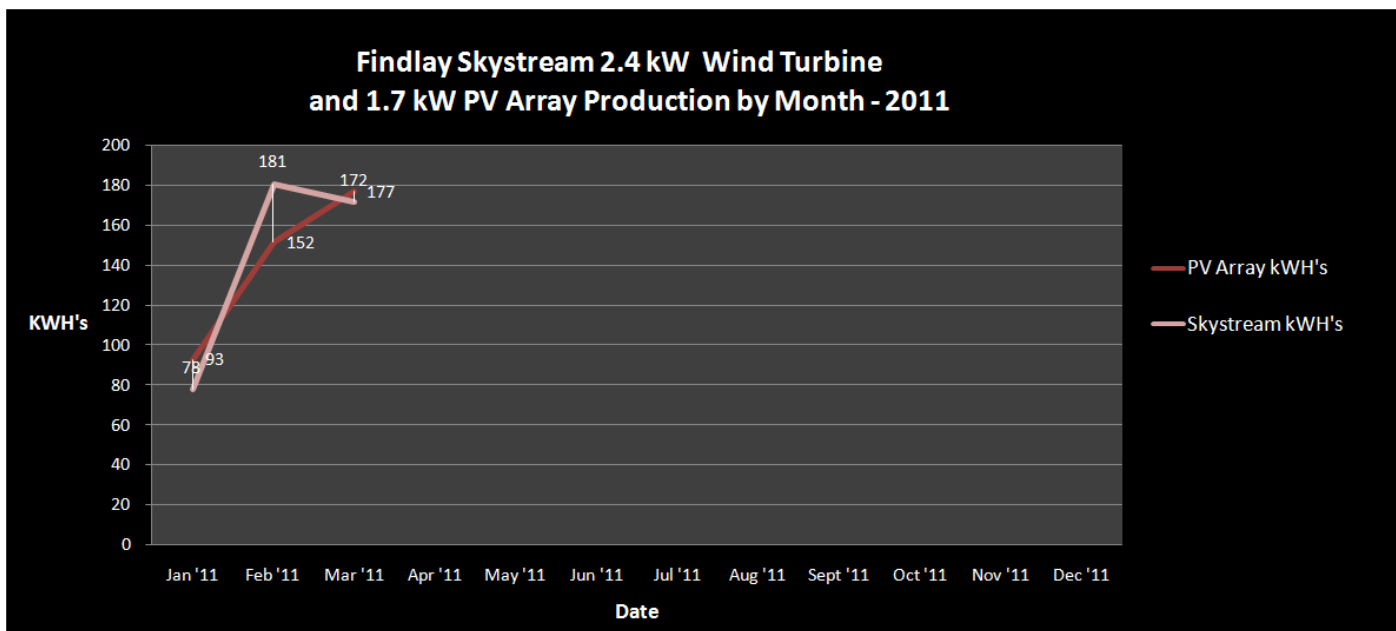
We are working with IT and the green link committee to get this information ported to the web and accessible.

I'll keep you posted.

1.7 kW Photovoltaic Solar Array - Findlay Campus

No changes here. The array continues to function well. Production data for both this array and the Skystream turbine is shown below as a comparison: Production increased from **152 to 177 kWh's** for March, as more and more sun is occurring.

The PV array outproduced the wind turbine during July, Aug, Sept, and Oct of last year, and then during the windier months, the turbine performed better than the array. Now the reverse is starting to happen. This is very typical and shows how each system complements the other during the year. (So if you plan to purchase some AE equipment, try to get one of each!)



The same dome camera mentioned above also shows this array in the same view. The link below will be on the page when it's done.

As mentioned under the Entegrity turbine above, we now have a public URL available to see the real-time production data from each panel in the array. it's pretty impressive! As I said, I'm working with Marty Stroud and our webmaster, Rodney Hough, to get that available on our green section of our Owens website, but it's available now as shown below: (and also on the Entegrity page)

<http://enlighten.enphaseenergy.com/public/systems/kfZk5615>

34 kW Photovoltaic Solar Array - Toledo Campus

Well, the modified language in the interconnection agreement with First Energy was finally accepted and they sent a revised form which we plugged into our existing agreement . John Satkowski signed in another required location and the revised and completed agreement was immediately sent to First Energy late last week.

Now another wait begins for them to send us a final email and approval to start feeding the power to the Engineering building. Believe me, I will stay on it! The system has been shut down until we get the approved agreement from FE.

There was one installation issue left to resolve and that is being fixed even as I write this. Once that is completed, I will inspect the whole system to make sure everything is in order, and when the FE approval is received, I will reconnect power to the array and let it start feeding the ET building.

At that point, our internet real-time production reporting system will be configured and permanently activated and you will be able to see what the array is doing!

You might have noticed we have a new dome camera mounted near the old one on the NE corner of ET. We are still trying to get an image up that everyone can see in a link. This camera also will get new software to improve its operational characteristics early this month. We hope to still get a live image available in the coming weeks!

Until we can get an image to the web, here is a live camera view link (from the old camera) to both the existing small PV array in the turnaround area of ET as well as the large array area pictured above: (the focus is as good as it can be.)

https://www.owens.edu/green/toledo-pv_array.html

1.06 kW Photovoltaic Solar Array - Toledo Campus

No changes here. As mentioned previously, I have completed work on the First Energy interconnection application. Before I can have John Satkowski sign it, a state electrical inspection of the installation will have to be done to complete the paperwork. Jim Mahaney is assisting with that.

So now we wait for the state electrical inspector to give us final approval.

This small array located in the turnaround area outside the Engineering building continues to function well but is **not** currently feeding power to the building until we get FE approval.

(The new dome camera shows this array as well as the new 34 kW PV array.) As mentioned, as soon as we can get an image from the new camera into a link, we will provide it.

Solar Thermal Panel System - Toledo Campus

We are still awaiting a report from the professional plumber who is to examine our plumbing system in ET. The issue is that we have no hot water in a timely fashion in the entire building. The flow controls put on all the lavatory sinks do slow the delivery somewhat, but the problem seems deeper than that. I will let you know what the outcome is on this.

The single Heliotope solar thermal panel continues to provide hot water for the Engineering building's bathrooms. The 4 ft x 6 ft panel is mounted on a slab just outside the atrium and office area and can easily be seen from the atrium. Antifreeze is circulated through the panel to collect the sun's rays and then this heat is transferred to a storage tank in the utility room. The future plan is to add panels from different manufacturers and see how production changes. December and January are the worst months for solar insolation, but even some thermal energy is collected on cloudy days.

All the above will be used for training purposes by students in the **Alternate Energy and Sustainable Systems technology**, a new two-year program under Design Technologies, and by Workforce and Community Training. Once all systems are running, Owens will have the most diverse and high-tech technologies of any school in the state. As always, stay tuned for more developments!

Any questions, comments, or clarifications, call or email.

Thanks,

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