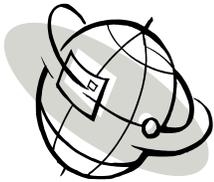


Energy Issues

IEP Newsletter

Existing Building Commissioning at North Carolina A&T State University –

(By: Aaron H. Curry, PEM, MSEE Energy Analyst – NCA&T University)



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North Carolina A&T State University – Williams Dining Hall



Chiller – Williams Dining Hall

During a building’s life, often it experiences mechanical failures; unbalanced comfort levels, forgotten manual overrides for HVAC equipment, etc. This means that the building is usually performing at less than its optimal designed settings for energy savings. Existing Building Commissioning (EBCx) is one way to give your building a tune up and restore it to its original designed settings. The EBCx process not only identifies problems due to design flaws or events that occurred during the building life, just as traditional commissioning of a new building does; but it also identifies problems that have developed during the building’s existence.

In February 2013, North Carolina Agricultural and Technical State University (NC A&T) completed an EBCx for Williams Dining Hall. Williams Dining Hall is the university’s main dining facility on campus. It was built in 1973, is 73,000 ft² and operates approximately 17 hours per day. The existing condition of the building was as follows:

1. Unbalanced zones
2. Failed HVAC related sensors and dampers
3. No setback settings during unoccupied times

The objective of the EBCx was to optimize energy usage by reducing the electrical and natural gas demand,

improve indoor comfort and air quality, minimize the cost of maintenance and operations, and extend the useful life expectancy of existing equipment.

The project was completed in July 2013. A one year overview was used to determine the effectiveness of the EBCx. As of July 2014 Williams Dining Hall had saved the university 538,370 kWh and 20,086 therms of natural gas. This resulted in utility savings of \$34,456 in electricity and \$12,091 in natural gas. The implemented facility improvement measures (FIM) in this effort will save the University approximately \$46,547 per year in utility costs, with a simple payback of less than one (1) year. The following FIMs were implemented to achieve the savings.

1. Chilled and Condenser Water Reset
2. Economizer Upgrades
3. Upgraded Hot Water and Chilled Water System
4. Humidity Sensor Replaced
5. Replaced Failed Thermostats
6. Building Setbacks and Scheduling

Overall, this was a successful project and the outcome has given the university a better understanding of the building’s mechanical operations and increased the comfort levels within the facility. This building was also used as a pilot project to be implemented in NC A&T’s Strategic Energy Plan (SEP) for the remaining existing buildings on the campus for years to come.

The Oil Balancing Act

(By: Thomas D. Mull, PE, PEM, CEM)

It wasn't all that long ago that the political wizards of energy were projecting \$125US per barrel would be the new norm for crude oil. That, like so many energy prognostications of the past, has been shown to be inaccurate, rendered so by technology and innovation.

While politicians and pundits debate the merits of expanding pipelines and production by utilizing technologies for extracting hard to reach deposits, the USA oil industry has been busy. Private sector efforts have been successful at reducing the country's dependency on foreign oil to the lowest level* in decades, while generating thousands of new domestic jobs.

As of this writing, the global cost of a barrel of oil has dropped below \$80.00 US. This is an extremely good thing for consumers. Regular gasoline in parts of the eastern USA is approaching \$2.65 per gallon, the lowest price in five years. Lower costs for heating oil should provide much needed relief for severe weather this winter. These lower costs will translate into more disposable income for households and reduced transportation/production costs for businesses and industry. However, as the cost drops some believe we may be approaching a balancing point.

Is there an *equilibrium price* for oil? What is the price (per barrel) that stimulates production and jobs, and yet does not create a disincentive for production from harder to reach deposits? The answer to this lies within a number of complex factors including:

- What is the cost of recovering oil from less accessible deposits? For example, the cost of extracting tar sand oil is about \$60.00 per barrel.

*As a percentage of total requirement

Given this, at what point will producers decide that it is no longer economical to continue production?

- Energy Independence – There are benefits, both economic and security, to providing all oil requirements domestically. For example:

1. No longer having to depend upon countries with which you have significant political and/or humanitarian differences.
2. Increased production creates domestic jobs, further stimulating the economy, and
3. The USA balance of trade would become more favorable

- OPEC – Since the 1970s OPEC has tried to manipulate the global price of oil. Its focus has been on keeping the price as high as possible, but sufficiently low to assure that alternatives were not economically viable. However, OPEC countries are in disagreement as to the best way to proceed. Is it better for them to continue to produce at current levels, reduce output in an effort to increase the cost per barrel, or increase output to make new USA production uneconomical?

- Political Instability – Much of the global production of oil is in areas that are politically unstable. History has shown us that even the threat of curtailment can raise the price.

With this uncertainty, price stability for oil is highly unlikely. It is a global commodity that will continue to be in high demand. Therefore, it will constantly be seeking a *balance point* between price and production.

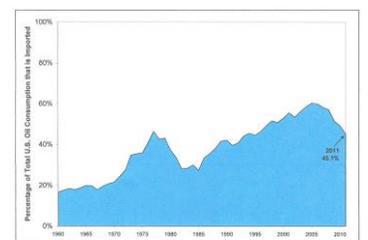
(Nov. 12, 2014 – The “wizards” of energy have predicted that the price of oil will drop another \$18US per barrel in 2015.)



North Dakota Oil Rig



Middle East



Sources: EIA, Monthly Energy Review, February 2012, Table 3.2a, and Annual Energy Review 2006, Table 51.

US Oil Importation

IEP

Institute of Energy Professionals



Courtesy of Merck
Pharmaceutical

Global Energy Training – Merck Pharmaceutical

(The following recently appeared in an on-line announcement.)

Recognizing the benefits from having employees that are energy knowledgeable, international pharmaceutical giant Merck late this summer signed on with Schneider Electric's *Energy University*. Their 70,000 employees worldwide have access to the *Energy University's* library of more than 350 product-neutral on-line training modules. In the article announcing Merck's decision, the objective of this initiative is to "...give the entire Merck workforce ideas for cutting energy consumption by up to 30% not only in the facility where they work, but also in their own homes.

The initial program focus has been on utilizing the *Energy University's* free tools to train personnel in Merck's Global Energy Network for Improvement in Usages and Supply

(GENIUS) teams that are appointed to assist in promoting more energy efficient behavior. Merck employees will have the option of completing the required course of study to become a **Professional Energy Manager (PEM)**.

Merck has already utilized the available training materials in a series of intensive three-day initiatives focused on identifying wasteful energy practices. To date, at ten different facilities more than \$27 million in potential savings and 88,000 metric tons of greenhouse gas emissions have been identified.

Schneider Electric's *Energy University* is recognized by various energy-focused organizations, including IEEE, the U.S. Green Building Council, and the Association for Facilities Engineering and a partner with the **Institute of Energy Professionals**.

Be a Contributor

The goal of the IEP Newsletter is to provide PEMs with timely useful information to help them better manage energy resources and control utility expenditures. To that end we would like your input. Let us know what type of information, articles or updates you would like to see in future Newsletters. Also, if you would like to contribute an article about a recent project or application of technology, all submittals used *will apply towards PEM renewal accreditation*. For additional information on being a contributor or recommending future topics contact Dan Mull with your suggestions.

PEM

Professional Energy Manager

IEP Contact Information:

Phone (USA): 1-919-280-3480

E-mail: danmull@theiep.org

Website: <http://www.theiep.org>