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Nashville Government's Energy Management Program

By: Laurel Creech

(Laurel is the Assistant Director of the Department of General Services, Sustainability Division, for the City of Nashville, TN. She participated in an intensive energy management training program conducted by IEP for Tennessee governmental personnel conducted in 2017.)

(All successful Energy Management programs employ proven principles and strategies. One of these is sustainability. Following is a brief article highlighting how in Nashville, TN these principles and strategies were employed. – Thomas D. Mull, PE, PEM, CEM)

The Metropolitan Nashville and Davidson County Government is working on decreasing its energy usage, increasing renewable energy resources citywide, and educating city employees about how to conserve energy. Following are some of the highlights of the city's efforts:

Metro Nashville's LEED ordinance

In 2007 the Metropolitan Nashville City Council passed a law mandating all new municipal buildings must be built to achieve Leadership in Energy and Environmental Design (LEED®) Silver or higher certification. Since then, the city's Department of General Services has designed and constructed twenty-one (21) such high performing buildings: twelve (12) LEED® Silver, eight (8) LEED® Gold, and one (1) award-winning LEED® Platinum Fire Station. In 2017 these buildings collectively reduced energy costs by an estimated $493,000 compared to similar non-LEED® certified facilities.

Figure 1 – LEED Platinum Certified Metro Nashville Fire Station

Metro's Center of Responsible Energy (CORE)

In order to keep Metro buildings at peak operating performance, the Department of General Services employs a comprehensive energy management system. System operations take place in a technology-filled control room called the Center of Responsible Energy (CORE) located in Nashville. This facility also acts as a backup emergency communications center in the event of a natural disaster or other crisis. From the CORE energy professionals monitor building systems and consumption, in addition to tracking the solar production from eight (8) rooftop arrays. They also record the usage from forty-nine (49) electric vehicle charging ports dispersed across seventeen (17) locations around Nashville.

Nashville Government's Energy Management Program

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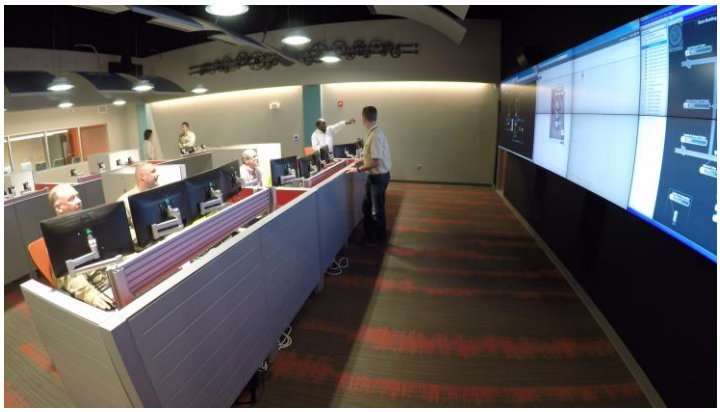

Figure 2 – Center of Responsibility Energy (CORE) Control Center

Dedicated staff, led by Energy Manager Mr. Freddie Adom, monitor energy usage for 95 municipal buildings, including fire and police stations, libraries and community centers, and office buildings. Forty (40) of the buildings are connected to a building automation system (BAS), which allows remote real time adjustment of building space temperatures, lighting, and schedules. In addition, if a mechanical or technical problem is identified at a specific building, a work order system allows seamless deployment of technicians to fix problems in a timely manner.

Figure 3 – CORE Control Center

Socket, Nashville's Sustainability Outlet

With all of these energy management tools, the Department of General Services developed a program to improve occupant behavior through an interactive, educational initiative called *Socket*, *Nashville's Sustainability Outlet*. Visit www.socket.nashville.gov.

Figure 4 – Program Logos

Nashville Government's Energy Management Program

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Socket is Metro Nashville's sustainability outreach and education program for both Metro employees and the general public. Socket provides practical sustainability education to more than 7,000 individuals annually via employee workshops, facility tours, public events, and communications including a website with blogs and tips, e-newsletter, and daily postings to social media. Socket connects city employees across dozens of departments to the sustainability aspects of their work. The program also connects the Nashville public to tips and best practices for saving energy and water, reducing waste, and living well.

Figure 5 – Socket Workshop

Solar Installations

Metro Government has several facilities that utilize solar energy. There are eight (8) installations on General Services facilities that produce 140,000 kWh annually, resulting in more than $26,000 in energy savings. The number of solar panels utilized by General Services is projected to more than double by fiscal year 2020, as 576 additional panels will assist in powering the Sheriff's Office Downtown Complex, the Metro Nashville Police Headquarters, and the Family Safety Center.

Music City Solar

Nashville's first solar park, Music City Solar, opened in August 2018. It employs 17,020 solar panels and is projected to produce up to 55 million kWh of "green" energy over its lifetime. Nashville Electric Service customers can purchase energy produced by individual solar panels and use the "clean energy" to power their home or business. In return they will receive a credit on their monthly bill. Metro's Department of General Services has a subscription for 510 panels, which will generate up to 84,660 kWh annually.

Through a combination of legislative mandates and voluntary department led initiatives, from solar power installations to a proactive outreach and behavior change program, the city of Nashville has established itself as a leader in sustainability within the built environment. For more information on Nashville's green buildings, including video "virtual tours" of several facilities, visit socket.nashville.gov.

Crude Oil Price Exceeds Predictions

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

The energy sector is no different than any other in the respect that the only thing constant is change. Several Newsletter issues back we highlighted oil future analysts predicting that the price of crude oil would fluctuate, but stay in the range of US$60 to US$70 per barrel during 2018. Since September the WTI (Nymex) price spiked slightly over US$76.00 per barrel, as shown in the graph below.

Graph Source: Nasdaq.com

Starting 2018 the WTI (West Texas Crude) price was US$60.25 per barrel. On October 16th WTI price was hovering near US$72.00 ($71.78) and the Brent Crude* price was approaching US$81.00 ($80.78) per barrel.

Crude Volatility:

Since the 1970s crude oil has been among the more volatile energy sources. International supply and demand issues, OPEC's attempt to control pricing, and the advent of more cost-effective domestic production have caused dramatic price fluctuations.

At one point (2005), the United States was importing 60.3% of its crude oil requirements. With the addition of new domestic supplies, crude importation has reportedly dropped to about half that value. Even so, the worldwide price of crude is subject to political and regional conflict issues that assure a volatile future for the price of crude.

The futures forecast, as of this writing, has the one year Nymex forecast for crude at US$79.00 per barrel. Time will tell.

* *The major reason for the difference in price between WTI and Brent Crude is because of the density and sulfur content of the Brent Crude extracted from the North Sea. It has a lower density and lower sulfur content than other crude oil deposits, thereby making it a more desirable and valuable form of crude.*

USDOE EM Update Newsletter – Case Study

By: Staff Writer

The US Department of Energy provides a free monthly electronic energy management newsletter entitled "EM Update". The newsletter covers a wide range of energy-related topics. Recent articles have included collaboration with foreign governments in the development of energy policy, hazardous soil removal, energy case studies, rehabilitation of well water flow, prevention of ground water contamination, and energy education in public schools.

One recent article entitled *Idaho Chiller Replacements Lead to Taxpayer Savings, Reduced Energy Use* focused on a recent replacement of air-cooled chillers at the *Advanced Mixed Waste Treatment Project** of the Idaho National Laboratory in Idaho Falls. The two (2) air-cooled chillers replaced were installed in 2003, when the project first went operational.

Figure – Installation of New Chillers

The new chillers employ a more environmental friendly refrigerant and are quoted as requiring *"..only one-eighth the energy of that previous model..."* This efficiency improvement allowed the company to apply for a utility rebate. In addition to system energy (operating cost) savings, taxpayers should receive the additional benefit of maintenance cost-avoidance associated with the fifteen (15) year old systems.

If you are interested in receiving the *EM Update Newsletter*, you can subscribe at the following website: *EMNewsletter@public.govdelivery.com*.

* *The Advanced Mixed Waste Treatment Project utilizes both conventional and unique high technology to retrieve, treat, and ship above ground and low-level wastes from an inventory of 65,000 cubic meters.*

The best know piece of equipment at the site is a large compactor, referred to as a "super compactor". This hydraulic press can exert four (4) million pounds of force and reduce a 35-inch-tall, 55-gallon drum to final size of a five (5) inch diameter puck, thereby dramatically reducing the volume of waste for landfills.