

P2 Internship 2009

EPA – Region 1

Energy Star Community Wide Energy Challenge

Melanie Maxem and Jim Potter worked with the EPA-Region 1 New England to promote EPA’s Energy Star Community Wide Energy Challenge (ES Challenge).



In 2009, the EPA promoted the ES Challenge to increase the efficiency of New England communities.

Melanie and Jim targeted municipal buildings and schools in _ towns and one vocational technology school. To complete the challenge the community must commit themselves to improving energy efficiency and to achieve at least a 10 percent energy reduction in the future. The towns must also promote energy efficiency and use of renewable energy to the citizens, companies and organizations in the community. [View more information on how the energy is quantified.](#)

Melanie worked with six Massachusetts communities to benchmark their buildings, to introduce energy reduction techniques and to show them how to save money by implementing these techniques. While working in Woburn, Mass., she completed a special grant project with the MTC. If the towns were able to reduce their energy by 10 percent the savings would be significant.

If 10% of energy is reduced...

Town (# bldgs benchmarked)	Energy Used (kWh/yr)	CO2 not emitted (metric tons)	Cost Savings	Barrels of oil saved
Groton (4)	989,486	71	\$ 8,318	165
Somerville (11)	46,828,094	980	\$ 108,912	2,280
Chelmsford (23)	64,842,212	1,364	\$ 166,736	3,173
Total	112,659,792	2,415	\$ 283,966	5,618

Jim worked with four New Hampshire and two Vermont towns to benchmark their municipal buildings and reduce their carbon footprint. The results of the towns are as follows:

If 10% of energy is reduced...

Town (# bldgs benchmarked)	Energy Used (kWh/yr)	CO2 not emitted (metric tons)	Cost Savings	Barrels of oil saved
Lee (7)	31,323	23	\$4,062	52

Concord (14)	718,546	516	\$135,572	1,200
Manchester (44)	5,659,430	4,064	\$303,000	9,452
Shelburne (3)	31,443	23	\$2,787	53
Hartford, VT (6)	458,203	329	\$20,078	765
Plainfield, VT (5)	75,331	54	\$8,166	126
Total	6,974,276	5,008	\$473,665	11,648

The EPA Energy Star Community Wide Energy Challenge has the potential to be a huge success. For those communities who get involved, the program will reduce energy consumption. One of the most compelling attributes of the ES Challenge is that it involves and educates members of the community on the effort to reduce energy consumption, therefore improving both their surrounding environment as well as their health.

Hitchiner Manufacturing in Milford, NH

Compressed Air, Exhaust Blower, HVAC, & Kolene

Jillian Tombarelli, a UNH student, spent the summer of 2009 working on multiple pollution prevention projects with Hitchiner Manufacturing in Milford, N.H. Hitchiner produces complex thin-wall investment metal castings for the automotive and aerospace industry. Jillian worked on projects to improve standard operating procedures at Hitchiner, which in 2008 cost approximately \$500,000 in unnecessary funds. It was determined that the largest contributors to wasteful spending were leaks in compressed air tubes, improperly installed HVAC systems and human behavior.

Electric Consumption

The largest area of operations addressed was electrical consumption through compressed air usage for their manufacturing processes. The compressed air system contributes to high electrical demands due frequent pressure drops, leaks in outdated equipment and misuse from employees. Jillian first identified and fixed leaks in air tubes as the first line of defense. There were over 200 leaks that were tagged and fixed in the Gas Turbine Operations (GTO) and Automated Casting Facility (ACF) processes. In repairing leaks alone the company saved 133,533 kWh, which is approximately \$20,000 a year.

When Jillian started her internship she noted that Hitchiner had non-cycling dryers which operate around the clock and do not vary between full and no load thus running for no reason. Jillian suggested that the company replace the equipment with cycling dryers which operate depending on size of cooling load and shut down during no load. This reduced their energy consumption by 91 percent or 112,733 kWh a year just for these two pieces of equipment.

Three other consumption savings suggestions given by Jillian were:

Plant 4 Compressor Shut Down Procedure – Originally the compressor ran 24/7 during an 80 hour on to 88 hour off shift. This was creating unnecessary energy consumption. The savings of shutting down the compressor was almost \$12,000.

Dust Collector Training Improvements – If the filters on the dust collectors are not checked or cleaned properly they may not maintain proper cleaning and health standards. Each replacement filter costs \$100. Hitchiner will need to implement a daily check on the dust collectors to make sure they are in proper working order.

Shutting down Exhaust Blower – There are three blowers on the roof of the GTO facility. One of them was never hooked up so the motors ran continuously without actually doing anything. Shutting the useless blower down saved \$18,000/year.

ACF Repairs

Heat recovery duct work was installed in the compressor room but was not being used. The equipment should be repaired and used in the winter to supplement heating system and to blow out heat during the summer months. In addition to repairing this one system, the plant managers and employees were asked to change their behavior by using a pass entry door instead of overhead door when traveling through the ACF. The garage door was used because the smaller door was key entry only. The problem with using the garage door is that it often was left open allowing cool air to filter outdoors during summer days. To alleviate this issue a handle was installed that allowed the door to be closed without being locked. With these changes the plant saved \$10,450 during heating season and \$150 a day during the summer months in addition to all of the energy not being used.

Kolene Process

The Kolene System is a molten salt bath that cleans the metal parts of any ceramic material. There are a series of tanks where the parts are submersed in sodium hydroxide and rinsed. Hitchiner has two systems that idle 24/7. During the current economical downturn the baths are not used as often so they are running on full temperature for much of the time. Hitchiner will be shutting down one of the tanks until part demand is increased saving 233,000 kWh (\$35,000) a year and also the bath that is still operational will be set to idle when not in use saving 35,500 kWh (\$5,313) a year.

Proper Inventory

A small project Jillian worked on was an inventory of compressed gas bottles on location. Airgas noted that there were 127 bottles at the facility when in reality there were only 97. Jillian noted that of the 97, fifty were not in current use and were no longer needed on-site. Removing those bottles saved the company \$6,808.

Recycling Programs

Hitchiner expanded their recycling program to include plastic bottles, cans as well as ink and toner cartridges. The cartridge savings alone added up to \$5,500 a year. That coupled with avoided disposal fee of \$64 a ton is quite a bit of savings for such a large facility.

Future Projects:

- Replace air motor driven mixers with electric motor powered mixers
- Variable Frequency Driver compressor for ACF (Savings of \$11,057/year)
- Possible treatment or re-use of hazardous waste from Kolene System (440-660 gal)

Overall, Jillian saved the company approximately \$130,500 during her internship, with the potential of an additional \$50,000.