

Summer 2016

EfficiencyToday™

Profiles in energy efficiency for business



Leading the charge for energy efficiency

Crown Battery's Bob Michael

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Wendy's LEDs the way

Page 8

Grocery stores clean up

Page 12





Julie Sloat
President and COO
AEP Ohio

President's Perspective

Cultivating an efficiency culture

Energy efficiency isn't a fad, and frankly, it's more than a trend.

It has become a way of life here in Ohio.

Energy efficiency in 2016 has evolved from what once was considered a sacrifice in comfort in exchange for an economic and environmental benefit, to a modern day energy management capability that delivers broad value without compromise. But we've also witnessed businesses embracing a new perspective regarding energy usage, thinking of it as an investment to improve productivity and brand reputation.

For more and more Ohio businesses and institutions, efficiency has become part of their culture from the boardroom to the break room. They're doing more than installing equipment—they're influencing employee attitudes and exceeding customer expectations for corporate responsibility.

That's one of the reasons we chose to launch Efficiency Today™, to bring you stories of efficiency taking place across our state. In this issue, you'll see efficiency cultural examples such as Crown Battery in Fremont, where it's been a way of life. You'll also read change-inspiring stories from fast-learning newcomers such as grocery stores, municipalities and schools.

All of these energy-use changes were funded in part by AEP Ohio's business efficiency incentive programs. In fact, one of our programs, Continuous Energy Improvement, or CEI for short, specifically focuses on cultivating an efficiency culture.

Ohio is on an economic roll and business cultures that encourage energy efficiency add to the positive momentum. We salute our featured businesses that are improving their bottom line and Ohio's economy in the process.

At AEP Ohio, we're working to maintain this positive momentum as well. In addition to our efficiency programs, we're designing a new grid that enables the integration of both current and emerging energy technologies, which will give you the tools and information to manage your energy in the manner that suits you best. This will assure a steady and secure energy future for all of us.

It's what drives our own culture—today. ■

EfficiencyToday™

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Note: All energy-savings calculations used throughout Efficiency Today™ are based on AEP Ohio's deemed estimated calculations. The annual energy savings are calculated using an electric rate of \$0.10 per kilowatt hour (kWh).



Andy McCabe
Manager of Business Programs
Energy Efficiency
AEP Ohio

Andy's Angle

The 5 W's of energy efficiency

As you read the stories about the remarkable energy efficiency results of businesses and municipalities in this inaugural issue of Efficiency Today™, it's useful to keep in mind the answers to what I call "The Five W's of Energy Efficiency."

Let's start with the "who" as in "who benefits?" The answer is practically everyone. If you use energy for building and production, your business is a definite candidate. After typically short payback periods, energy savings go right to the business's bottom line. There's no need to manufacture and sell additional goods—it is very realistic to have the same or increased output while using less energy. Our team of trusted energy advisors are another "who"—they help match immediate business needs to the appropriate AEP Ohio Business Incentive Programs.

As for the "what" and "where" questions, the answers usually are found in systems within new or existing commercial and industrial buildings as well as manufacturing facilities. The "what" can also be behavioral benefits derived from employee education and low or no cost process changes. You'll also find the "where" as anywhere energy is consumed, such as indoor and outdoor lighting, HVAC, pumps, fans, compressed air, and IT equipment—they all provide efficiency opportunities.

The answer to "why" is simple. Obviously, there are the oft-mentioned energy and dollar savings. But beyond the dollars and kilowatts, energy efficiency enhances sustainability and demonstrates the kind of corporate and environmental stewardship that enhances the reputation of businesses and communities. Then, there are those "non-energy benefits" that often turn out to be the most valuable. These can include operational savings, maintenance savings, employee safety and comfort, and productivity.

Answering the "when" question is short and sweet. Do it now. Every day a business operates inefficient systems is a lost opportunity. The only exception to "now" is when renovation, installation or expansion plans are in the near future. New construction and renovation projects are ideal times to build in efficient equipment with present day codes and standards.

Thank you for taking a look at Efficiency Today™ and for your interest in our energy efficiency programs. I hope that the stories generate questions and conversation at your workplace. When you're ready, contact us and let's get started on writing an efficiency success story for your business. ■

7 Summer Energy Tips

1. Use HVAC temperature setbacks:

Turn up temperature settings during unoccupied hours and on weekends. Use a programmable thermostat or a building automation system.

2. Employ daylighting controls:

Daylighting control systems use sensors to adjust electric lighting levels in response to available daylight. These controls can reduce your lighting energy consumption by 20 to 80 percent, and lower your cooling costs.

3. Precool at night: If you have a building automation system, consider cooling the building at night with outside air. This strategy can save between 5 and 20 percent of overall cooling energy depending on climate. It also can improve air quality.

4. Clean condenser coils: Dirty condenser coils in your air conditioning equipment decrease their ability to transfer heat. Give the coils a thorough washing twice annually.

5. Change the filters: Clogged filters cause air conditioning systems to work harder, which wastes energy. Check and change them regularly, particularly if your building is close to a construction project that kicks large amounts of dirt and debris into the air.

6. Check the economizer: Many air conditioning systems use a dampered vent called an economizer that draws in cool outside air, when available, to reduce the need for mechanically-cooled air. The linkage that opens and closes the damper can seize up or break. If stuck in the open position it can increase a building's annual energy usage by as much as 50 percent.

7. Hire a licensed tech to check the system: Have a licensed technician check, clean, calibrate, lubricate, and, if necessary, repair your air conditioning.

Award Announcements

Fourth Annual AEP Ohio Energy Efficiency Awards

AEP Ohio hosted its fourth annual Energy Efficiency Awards event in April 2016 to recognize businesses, industries and schools for their continued success in the energy efficiency programs. A total of 28 awards were provided.



Debby Yerkes (center) accepts the Leadership award on behalf of the Ohio Energy Project.

(L-R) **Mark McCullough**, AEP executive vice president Generation, **Karen Sloneker**, AEP Ohio director customer services and marketing, **Debby Yerkes**, **Julie Sloat**, AEP Ohio president and COO, **Alberto Ruocco**, AEP vice president and CIO

Sustained Excellence Awards

Awards given based on sustained involvement, typically requires high involvement in back-to-back years as a measure of sustained/consistent involvement

Crown Battery Manufacturing Company
Energy Management Solutions, Inc.
Greene Life Corporation
Greene Solutions, LLC
Heapy Engineering
P & D Builders
The Kroger Company

Efficiency Champion Awards

Awards given based on annual participation in our programs

Bridgestone	All Phase Electric
LuK Inc.	Walmart (two awards)
Kenworth Truck Co	Big Sandy
Circleville City Schools	Pride One Construction
Triumph Thermal Systems	Comfort Energy Consultant
Giant Eagle	Columbus Worthington Air
Wendy's	IMPACT
Air Technologies	Tim Dudek – teacher

Leadership Award

The leadership award is designed to be given to one entity annually based on on-going involvement and a sincere partnership relationship. Previous winners include Ohio Hospital Association (OHA), Ohio Manufacturing Association (OMA) and Ohio Partners for Affordable Energy (OPAE).

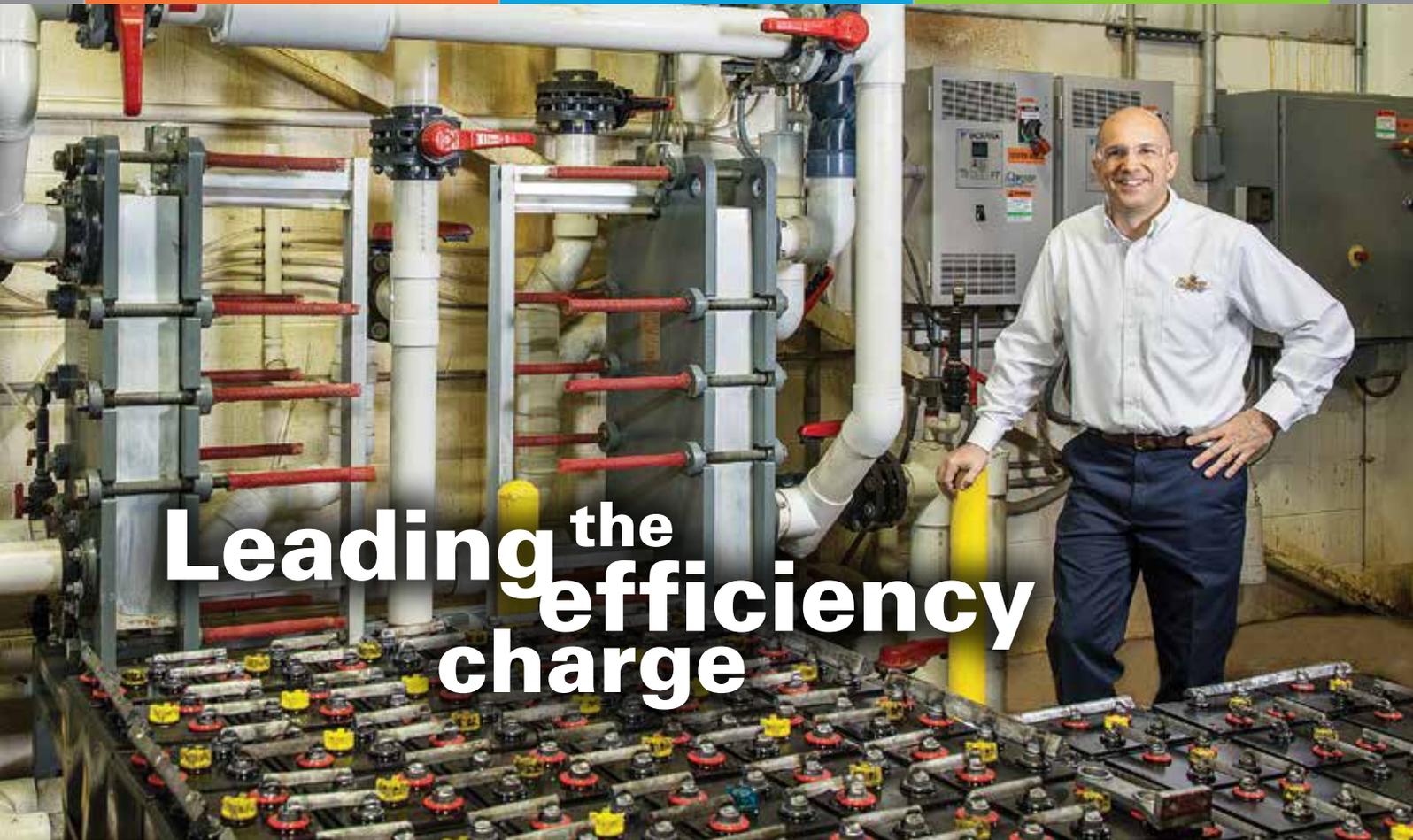
Ohio Energy Project (OEP)

Our 2015 recipient works to educate the next generation of customer and energy thought leaders, and supports our e3Smart program for schools.

Innovation Awards

Awards reserved to recognize program participants who have done something particularly innovative or specific to a pilot or special program offering

Allied Supply
Johnstone Supply
City of Martins Ferry



Leading the efficiency charge

Crown Battery's **Bob Michael** stands next to an upgraded ARS system.

Crown Battery generates effective conservation ideas in a unique way

You expect a battery manufacturer with a global customer base to know a thing or two about energy efficiency.

At Crown Battery Manufacturing in Fremont, efficiency is about much more than just sheer know-how. It's become a way of life. From the boardroom to the shop floor, every Crown employee is on the lookout for opportunities to save energy.

"Energy management has become one of our core values," says Bob Michael, Crown's director of plant engineering. "And AEP Ohio's Business Incentive Programs have been an important part of the process."

Michael credits the programs for giving Crown something beyond just the practical. "The incentives do more than help us save energy. They give us a competitive edge."

For Crown, that edge comes in the form of production efficiencies generated by a comprehensive approach to

energy management. "It's tough to make a buck in the battery industry, so efficiency is the key to success," adds Michael.

Changing minds and machines

Crown Battery used three of AEP Ohio's Business Incentive Programs to help fund equipment upgrades and cultural changes. The sum total of the incentives came to more than \$250,000.

“The incentives do more than help us save energy. They give us a competitive edge.”

Bob Michael, Director of Plant Engineering, Crown Battery

Up first were incentives for previously completed efficiency improvements. AEP Ohio's Self-Direct Program provided Crown with retroactive incentives for projects completed within three prior years. Crown received compensation for two recently completed efficiency projects: the replacement of an old inefficient lighting system and a new battery charging acid recirculation system (ARS).

The ARS system upgrade was a game-changer, as 70 percent of Crown's energy use came from charging batteries. The new system cut the recharging time in half.

The next improvement came in the form of a new cooling system, this time with help from AEP Ohio's Custom Program. Crown earned incentives for an energy-efficient, open-loop geothermal process cooling system, which saved 163,452 kilowatt hours (kWh) annually.

Beyond upgrades to machinery, Crown looked to change minds as well. To instill a culture of energy efficiency, Crown entered the Continuous Energy Improvement (CEI) Program, which provided workshops and training at every level.

One result of Crown's participation in the CEI Program is inspiring employees to look for energy efficiency improvements as part of their everyday routine. The employees themselves came up with a novel idea to honor the best efficiency ideas. "Buck Dynasty" is an internal incentive program, playing off of a certain reality television show. It rewards employees for submitting suggestions. Participants in the program receive a themed t-shirt to wear around the plant and office, and employees who hand in 10 "accepted requests" receive a gift card.



(L-R) Crown's "Efficiency Champion" and "Sustained Excellence" awards from AEP Ohio; T-shirts given to participants in Crown's employee-created incentive program



By the numbers

Crown Battery

Total Project Cost
\$1,299,480

Incentives Paid
\$259,831.39

Annual Energy Savings
\$328,573

Annual kWh Savings
3,285,733

Project Payback Time with AEP Ohio Incentives
3.2 years

Value Added
Employee engagement



Crown's newest and most efficient ARS system is now up and running.

Brighter days ahead

The energy efficiency machinery upgrades and heightened engagement of Crown employees have paid off in a big way.

The total annual energy savings are staggering—3,285,733 kWh per year.

With such strong results, Crown Battery is committed to doing more in the future. One project on the drawing board is another upgrade to the mission-critical ARS system,

this time through AEP Ohio's Custom Program.

"Each energy efficiency project brings a lot to the table," says Michael. "We have a goal to lower our energy usage by 3 to 4 percent every year. The more energy we save, the cheaper it is to produce an item. By producing a lower cost product, we increase sales. And we show the community our commitment to sustainability, which improves our company image." ■



Efficiency is **their recipe**

Wendy's energy efforts beef up brand, profitability and customer experience

When it comes to beefing up its energy efficiency efforts, Wendy's is serving up a triple with all the toppings.

The Dublin-based restaurant chain has gone all-in on upgrading its restaurants. During the past three years, Wendy's has made significant progress in reducing energy use by implementing over 1,100 individual energy upgrade projects at more than 550 restaurants.

"Quick-service and fast casual restaurants with long operating hours are great candidates for energy efficiency programs," said Angie Rybalt, AEP Ohio's EE/PDR business channel coordinator.

In Ohio, Wendy's took a leadership role when it implemented energy upgrades at nearly 30 Columbus-area restaurants and its Restaurant Support Center. Wendy's was recognized by AEP Ohio for its commitment to energy efficiency in 2014. The company saved more than 1.2 million kilowatt hours (kWh) annually, equivalent to removing more than 1,000 tons of carbon dioxide and nearly 200 cars per year.

Besides the company's deep dedication to efficiency efforts, Wendy's had two other strengths that contributed to its success: timing and geography. "The best time to consider energy efficiency incentive options is during the design phase of renovation or building," said Rybalt.

Wendy's Restaurant Support Center in Dublin features many efficiency upgrades.
Photo courtesy of Loeb Electric

The company's Dublin headquarters made it simple for AEP Ohio and Wendy's to collaborate while renovation and construction projects were still on the drawing board.

Many of the projects are under the watch of Scott Moline, project engineer at Wendy's. "Energy efficiency is always a consideration when we're selecting equipment, goods and services," he said. "AEP Ohio has been a great utility partner because its people and programs make it so easy to find the best incentive opportunities." Moline also credits Loeb Electric for its help in the lighting upgrades.

So far, Wendy's has earned more than \$168,000 worth of incentives from AEP Ohio.

“Energy conservation makes good business sense, and it is a reflection of the responsibility we feel to be a good neighbor and steward of the environment.”

Scott Moline, Project Engineer, Wendy's

Wendy's efficiency projects have included the installation of LED lights in the interior and exterior, upgrading HVAC systems and installing more efficient motors in walk-in coolers. These actions have saved more than 13 million kilowatt hours (kWh), roughly equal to the amount of electricity used to power nearly 1,200 average U.S. homes for a year.

The exterior and parking lot LED upgrades add plenty of aesthetics and a sense of safety to customers. "They really make our restaurants pop," adds Moline. Inside, the LEDs make the dining room more pleasant. Even inside the walk-in coolers, the LEDs provide another type of efficiency altogether—

improved productivity. Employees can find chilled and frozen ingredients easier and faster due to the better light coverage and instant brightness. "LEDs love the cold so they light up instantly," he said. "There's no place for items to hide, so you can quickly find what you're looking for."

The new motors on the walk-in coolers and freezers not only operate more efficiently, they're also quieter, making for a more pleasant work and dining environment. Wendy's has also found savings in the sizzle, installing ENERGY STAR® certified fryers and grills whenever possible.

Then, there's the new ultra-high efficiency HVAC systems to be installed in all new restaurant construction. The installations are

just beginning, but if the system brought on-line at a Wendy's central Ohio Hilliard location last fall is any indication, the savings will be enormous. So far, electrical usage is down 66 percent. "We knew it was going to be good, and it's even better than we imagined," said Moline.

With all of this success, it's no surprise that Wendy's was early to the table as a participant in the Department of Energy's Better Buildings Challenge. Among the first restaurants to join the Challenge, Wendy's committed to reduce energy consumption in its U.S. company-owned restaurants by 20 percent per transaction by 2025.



By the numbers

Wendy's

Total Project Cost

\$731,121

Incentives Paid

\$168,123

Annual Energy Savings (projected)

\$188,416

Annual kWh Savings (estimated)

1,884,162

Project Payback Time with AEP Ohio Incentives

2.9 years

Value Added

Enhanced brand image; improved dining ambiance

Wendy's all-in approach to efficiency has had a positive impact on its brand image as a fresh, contemporary restaurant that's a cut above its competitors. The lighting and design of the restaurants deliver a striking street appearance and improved customer experience, and the efforts as a whole enhance the company's reputation as a great corporate citizen.

"Energy conservation makes good business sense, and it is a reflection of the responsibility we feel to be a good neighbor and steward of the environment," said Moline. ■

Agri-Cultural Phenomenon

High-efficiency ventilation fans and milking pumps make for contented cows inside the Four Pines Farm milking parlor.



New milking parlor, above, at Four Pines Farm just outside of Sugarcreek



Bill Deetz, left, next to the high-efficiency plate cooler that pre-chills the fresh milk before it enters the refrigeration tank

As always, the original green industry reaps what it sows

Many associate agriculture with rustic barnyard images and centuries old production processes.

The reality is that today's ag-operations are as much about Silicon Valley as they are silos and barns. Large-scale refrigeration, lighting and HVAC needs make them a natural for efficiency upgrades.

Here's how a couple of long-time Ohio agribusinesses made hay with incentives from AEP Ohio's Business Incentive Programs.

Churn and change: Four Pines Farms

The year was 2011. Bill and Tina Deetz, owners of Four Pines Farms, a five-generation dairy farm located near Sugarcreek, were at a crossroads.

“It has been a great benefit to our business.”

Tina Deetz, Co-Owner and Office Manager, Four Pines Farm

Should they risk putting capital into a complete overhaul of their farm and increase their herd from 700 to over 1,000?

“We knew it would be like starting over,” said Bill. “We were maxed out at the old farm.”

The upgrades under consideration included a new state-of-the-art milking parlor. The old parlor was over 25 years old, and an AEP Ohio energy audit had just demonstrated that it guzzled electricity the way a hungry teenager downs

a quart of milk. The Deetzts also were mulling over the building of two free-stall barns and completely updating their manure handling system.

The Deetzts decided the overhaul was a go, but it was a tough call. “It took a lot of research, professional counsel, financial consideration and prayer,” said Tina. The Deetzts also took advantage of an incentive from AEP Ohio's New Construction Program to help offset the costs. They broke ground in the fall of 2012 and moved the operation to the new site on January 20, 2014.

The new facility is brimming with energy conservation features. “It's a slick set up,” said Dana Koppes, P.E., owner and lead engineer at New Energy Systems who consulted with the Deetzts on the project.

Variable speed technologies assure that vacuum pumps and ventilation fans operate at peak efficiency. The fans also can be switched on and off via a hand-held controller from anywhere at the farm. Because cooling milk drinks up a significant percentage of a dairy farm's energy costs, a high-efficiency plate cooler is used to pre-chill the milk with cool well water before it enters the milk tank to reduce the load on the tank's refrigeration unit. The farm also uses high-efficiency T5 fluorescent lighting throughout the farm, which uses 35 percent of the electricity that the old-style metal halide fixtures do.

So far, the Deetz family is pleased with the new facility. “It's been a great benefit to our business,” said Tina. Koppes estimates that based on his benchmarking of

By the numbers

Four Pines Farm

Total Project Cost
\$163,813

Incentives Paid
\$52,300

Annual Energy Savings (projected)
\$85,781

**Project Payback Time with
AEP Ohio Incentives**

1.3 years

Value Added

Substantial production increase

other farms with similar technology, the Deetz can expect to cut their energy costs by at least 25 percent.

The new technologies also have peaked the interest of a sixth Deetz generation. Spencer Deetz came on board after graduating from college, and younger brother Dawson is set to do the same when he completes his studies. Although her college degree isn't in agriculture, daughter Mackenzie, the oldest of the Deetz children, is considering joining her brothers. "She hasn't totally ruled it out," said Tina. "I guess you could say that it's in our blood."

Carving usage at Cooper Farms

Cooper Farms is a turkey processing company in Van Wert. Founded over 75 years ago by Virgil Cooper, it has become fully integrated over the course of time, acquiring feed mills, grow-out farms, a processing facility and a cooked meats plant. The company today is run by his children

Jim, Gary and Dianne, along with several grandchildren.

The focus of Cooper's initial energy efficiency upgrades was its cooked meats plants, where they could get the most bang for their buck. "This is a family-owned business," said Brad Alspaugh, Cooper Farm's maintenance project engineer. "When you reinvest back into the business, you have to spend wisely. Investing in energy efficiency is a smart thing to do because of the long-term benefits."

The challenge to installing energy efficiency measures was preserving the plant's production schedule and to introduce as few foreign materials as possible into the processing facility.

"We received regular updates from our AEP rep, and we knew that there were qualified electrical contractors that would help us," said Alspaugh, a 20-year employee at Cooper Farms. "But the incentives really pushed us to do this project. They helped the return on investment look a lot better."

Sarka Electric, Cooper's partner in the installation, worked around the plant schedule by working overnights and weekends to install new lamps and retrofit variable speed drives (VSD) into the ventilation system.

"Sarka's crew knocked out the installation of the lights quickly in spite of having to schedule and re-schedule their work around us," said Alspaugh. The VSDs also required a weekend installation because the air compressor could not be shut down during regular business hours. The air compressor serves the main processing building and is required to maintain a steady 90 pounds per square inch even as the load demand changes as equipment starts and stops.



(top) Mature Cooper Farms turkey at its Fort Recovery facility; (bottom) Cooper Farms has a diverse line of products including chicken eggs for consumer table use.

The investment returns have been robust so far. "We've been delighted in the reduction in our energy bills," said Gary Cooper. The success of the energy efficiency installations in Cooper Farms' cooked meats facility has inspired plans for similar projects. "New buildings are on the drawing board, and the plan is to make them energy efficient from the ground up," said Cooper. ■

By the numbers

Cooper Farms

Total Project Cost
\$137,555

Incentives Paid
\$35,204

Annual Energy Savings (projected)
\$86,037

Annual kWh Savings
860,374

**Project Payback Time with
AEP Ohio Incentives**

1.2 years

Value Added

Reduced maintenance costs

“...the incentives really pushed us to do this project. They helped the return on investment look a lot better.”

Brad Alspaugh, Maintenance Project Manager, Cooper Farms



A tale of two grocers

Chains large and small find savings in cool places

The beautifully arranged and presented merchandise in your favorite supermarket can make you forget that this is one very tough business.

In the grocery trade, razor-thin profit margins means that every dollar of profit is hard-won, and any reduction in cost provides precious breathing room for bottom lines.

Energy efficiency can provide cost savings by the cart full for grocery stores, as they're open long hours and depend greatly on refrigeration and lighting.

Two Ohio-based chains recently took advantage of AEP Ohio's Business Incentive Programs: Kroger, the nation's largest grocer, and family-owned Carnival Foods, a three-store independent grocer based in Lancaster.

Kroger: Cool and in control

Browse through the refrigerator and freezer cases of almost every central Ohio Kroger store and you'll find telltale signs of energy efficiency at work.

By the numbers

Kroger

Total Project Cost

\$10,604,729

Incentives Paid

\$1,613,763

Annual Energy Savings (projected)

\$2,658,032

Annual kWh Savings (estimated)

26,580,320

Project Payback Time with AEP Ohio Incentives

3.4 years

Value Added

Constant temperature control

Kroger took advantage of AEP Ohio's Self-Direct and Custom programs to help offset installation costs on many of the projects. "The Kroger Company is committed to environmental sustainability," said Jason Case, energy engineer at Kroger. "Working with our partners at AEP Ohio, we are able to reduce overall energy consumption at our stores, which translates to cost savings and a healthier planet."

Kroger retrofitted its refrigerator cases with cool and efficient LEDs in every central Ohio location. In the vast majority of the stores, temperature sensors keep tabs on the refrigerator cases via a monitoring system that can be controlled remotely with Internet access and a password. The remote monitoring system alerts management when a case is below or above its proper temperature range. This heads off energy-wasting temperature corrections and reduces or eliminates the need for expensive complete defrosts.

The Kroger Company is committed to environmental sustainability.

Jason Case, Energy Engineer, Kroger

(L-R) Retrofitted LEDs in Kroger meat case; LEDs installed in Kroger showcase produce





(L-R) Retrofitted doors in dairy section of Carnival Foods store in Lancaster; Recently installed high bay LEDs brighten Carnival Foods' Lancaster store; Carnival Foods owner **Dan Bay** leads the independent grocer's efficiency efforts

In more and more Kroger freezer aisles, motion-detection LEDs light up when a customer opens a door and reaches for a frozen treat.

Every Kroger store built since 2010 has an innovative energy saving feature called daylight harvesting. On bright sunny days, a light level sensor mounted in the skylights communicates with the building control system, which in turn shuts down some of the overhead lighting. In Kroger stores open 24 hours, one third of the sales floor lighting shuts off during overnight hours.

Carnival Foods: Brighter cases, warmer aisles

Making energy efficiency upgrades is nothing new to Dan Bay, who owns Lancaster-based Carnival Foods.

"About fifteen years ago, we replaced the old ballasts in our fluorescent lights with new electronic ones," said Bay. A few years later, Bay swapped out the T-12 bulbs for T-8s and has now begun to put high bay LEDs in his stores.

"We always get great returns when we upgrade lighting—it always pays for itself in three years or less," said Bay. Bay credits the AEP Ohio reps for taking care of all the paperwork. "They really know their stuff," he says.

More recently, Bay's lighting upgrades were focused on the refrigerator aisle, where LEDs were retrofitted into

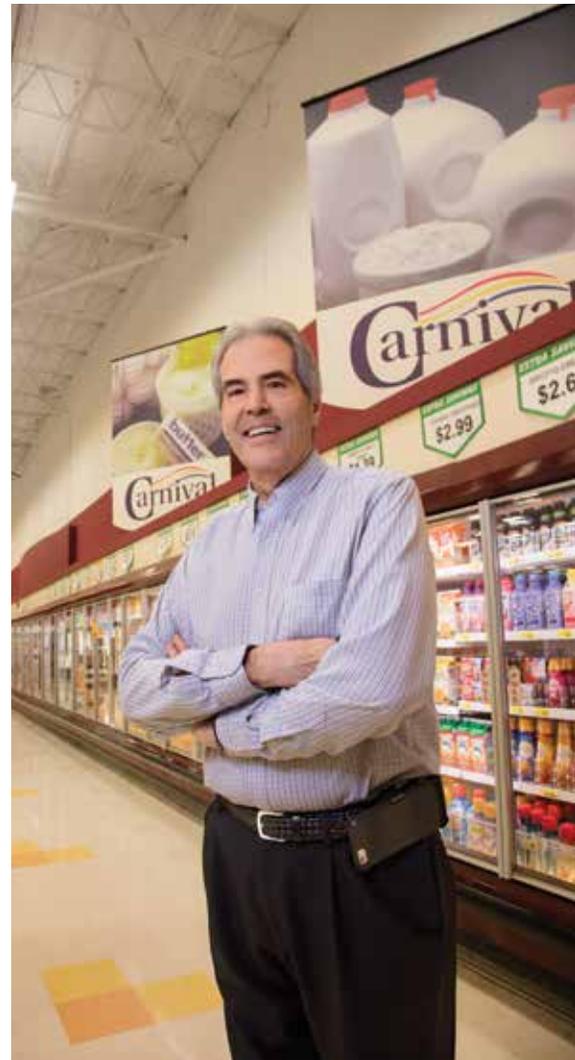
the cases. While he was impressed with the cost savings, he raves about the upgrade in aesthetics. "The old bulbs had a yellowing effect on the merchandise; the new LEDs make things really pop," said Bay. "It's just a brighter light." One surprising benefit was that customers could read the small nutritional fact section on product

“We not only brightened up the cases, we warmed up the aisles.”

Dan Bay, Owner,
Carnival Foods

packaging. The LED case lights last a lot longer, so the maintenance cost of changing lamps is virtually eliminated.

Along with the lighting, another efficiency retrofit that paid off in unexpected ways was the addition of doors to the refrigerator cases in the dairy section. The old open cases allow cold air to escape, and during the peak air conditioning usage in the summer months, customers would freeze. "People noticed the difference immediately," said Bay. "We not only brightened up the cases, we warmed up the aisles." The doors also kept the products cold during power outages, providing an extra 15 hours of protection versus open cases. ■



By the numbers

Carnival Foods

Total Project Cost
\$211,735

Incentives Paid
\$54,549

Annual Energy Savings (projected)
\$82,433

Annual kWh Savings (estimated)
824,330

Project Payback Time with AEP Ohio Incentives
1.9 years

Value Added
Customer comfort; added merchandise appeal

Lima swings for the fences



Efficiency creates savings in both expected and unexpected places

Summer evenings in Lima bring a buzz of activity at Simmons Field.

That's the home turf of the Lima Locos, a beloved team of collegiate baseball players and 2015 champions of the Great Lakes Summer Collegiate League (GLSCL). Made up of players from colleges across the nation, Locos games have become a popular gathering place for family and friends.

The Locos were almost lost to another facility in the region when the GLSCL required renovations to the field that weren't in the city budget.

“Our electrical usage has gone way down, along with our maintenance costs.”



David Berger, Mayor,
City of Lima

Fortunately, Mayor David Berger and the people of Lima stepped up to the plate, taking advantage of a pilot program from AEP Ohio that put \$75,000 into the city's budget. All of the incentive

dollars went to renovations at the ballpark, which included energy-efficient lighting for night games.

The program, called Community Energy Savers, rewards a community for encouraging energy efficiency among its residents and businesses.

In Lima, nearly everyone within the city limits received information about energy-efficient light bulbs, as well as online and in-home energy audits. “We did some serious educating and recruiting,” said Mayor David Berger, who also implemented door-to-door canvassing to bolster the program's mass marketing efforts.

Community Energy Savers was just one of many energy efficiency programs the city took advantage of. “AEP Ohio's top management came to see us personally and walked us through all of the potential incentives and savings,” said Berger. “They've been very responsive to our needs, and their people stay in constant contact with us.”

One of the programs provided incentives for converting some of Lima's street lamps to super-efficient LEDs. “They sip electricity and they last forever,” said Berger. “Our electrical usage has gone way down, along with our maintenance costs.”

The LED conversions weren't limited to street lights. Inside city buildings, more and more fluorescent fixtures have been swapped out for more efficient new ones. Beyond lighting, AEP Ohio incentives helped

fund improvements and replacements to pumps and processors at the city's water treatment facilities.

For city governments like Lima, the savings generated by energy efficiency programs can help make up for lost revenue. "Conservation can't make up for all of the lost ground, but it can help balance budgets while making improvements," said Berger.

It can also help a community go to bat and save a local institution. ■

By the numbers

City of Lima

Total Project Cost

\$1,777,080

Incentives Paid

\$319,007

Annual Energy Savings

\$463,818

Project Payback Time with AEP Ohio Incentives

3.1 years

Value Added

Local institution saved; participating residents able to save energy and money; goodwill



(L-R) LED-retrofitted street light in downtown Lima; High efficiency lighting at Simmons Field; Energy-efficient pump at Lima's water treatment facilities; One of downtown Lima's many historic buildings; Lima Locos receive pregame instruction at a summer night game.



Business Savings Incentive Programs



Agribusiness

Agribusinesses often have large-scale refrigeration, lighting and HVAC needs, making them a real natural for energy efficiency upgrades.

Project examples:

LED lighting upgrades, advanced lighting controls, variable speed drives on refrigeration units and HVAC systems, new production facilities

Applicable programs:

New Construction & Major Renovation, Prescriptive, Custom, Express Direct Install



Government & Non-Profit

Energy efficiency improvements make sense for governments and non-profit organizations grappling with tightening budgets.

Project examples:

Replacement of street lights and traffic lights with LEDs, office lighting LED upgrades, advanced lighting controls, variable speed drives for pumps and fans at water and wastewater treatment facilities, community outreach for efficiency efforts

Applicable programs:

New Construction & Major Renovation, Prescriptive, Custom, Data Centers, Community Energy Savers, Express Direct Install



Retail

With their dependence on lighting and HVAC, as well as long operating hours, retail stores can often ring up large savings from energy efficiency installations.

Project examples:

Variable frequency drives in HVAC systems, LED lighting, advanced lighting controls

Applicable programs:

New Construction & Major Renovation, Prescriptive, Express Direct Install



Grocery & Convenience Stores

With their long operating hours and reliance on refrigeration and lighting, grocery and convenience stores stand to save big on energy efficiency improvements.

Project examples:

Temperature monitoring systems and sensors; LEDs for refrigerators, freezers and high bay fixtures; advanced lighting controls; retrofitted refrigeration and freezer case doors

Applicable programs:

New Construction & Major Renovation, Prescriptive, Express Direct Install



Hospitals & Health Care

By improving energy efficiency, hospitals and health care facilities can save money, help prevent greenhouse gas emissions, improve the air quality of their communities, and support their commitment to public health.

Project examples:

Variable speed cooling fans in data centers, variable frequency drives in HVAC systems and LED lighting, advanced lighting controls, retrocommissioning studies to reveal areas of efficiency improvement, employee efficiency education programs

Applicable programs:

New Construction & Major Renovation, Prescriptive, Custom, Retrocommissioning, CEI, Data Centers, Express Direct Install



Manufacturing & Warehousing

Manufacturing facilities are among the most energy-intensive operations. Whether making batteries, bottling drinks, or canning vegetables, there is great potential for energy efficiency improvements. Also, the buildings required for warehousing have large footprints and massive lighting and HVAC needs.

Project examples:

Variable frequency drives in HVAC systems, LED lighting, advanced lighting controls, battery-charging systems, open-loop cooling systems, retrocommissioning studies to reveal areas of efficiency improvement, employee efficiency education programs

Applicable programs:

New Construction & Major Renovation, Prescriptive, Custom, Self-Direct, Retrocommissioning, CEI, E-motor Rewind, Express Direct Install



Office Buildings

Savvy owners of commercial buildings are actively invested in energy efficiency, cutting energy costs while improving building performance and financial returns.

Project examples:

Variable frequency drives in HVAC systems, LED lighting, advanced lighting controls

Applicable programs:

New Construction & Major Renovation, Prescriptive, Express Direct Install, Self-Direct



Small Business

Energy efficiency measures can be a game changer for small businesses, as they can provide significant expense reductions and operational improvements.

Project examples:

LED lighting retrofits, advanced lighting controls, variable frequency drives in HVAC systems

Applicable programs:

New Construction & Major Renovation, Prescriptive, Custom, Express Direct Install



Schools & Universities

By improving energy efficiency, colleges and universities can distinguish themselves as environmental leaders and save money for repair and renovation, hiring of new faculty, new construction, and other core activities.

Project examples:

New school buildings, variable speed fans to cool data centers, LED lighting retrofits, advanced lighting controls, variable frequency drives in HVAC systems

Applicable programs:

New Construction & Major Renovation, Prescriptive, CEI, Data Centers, Custom



“It was common to receive a call every day regarding a malfunctioning traffic signal or street light. Those calls have dropped to one per week.”

Doug Serban, Signal and Lighting Supervisor, City of Canton

City Engineer **Dan Moeglin** and Traffic Engineer **Eduardo Molina** pose underneath an LED retrofitted street lamp in Canton's revitalized West Park neighborhood.

LEDs a new avenue of savings in Canton

New traffic signals and street lights pay off in the most important way

The story of the city of Canton's energy efficiency efforts should brighten every taxpayer's day.

Lighting the way was Douglas Serban, Canton's signal and lighting supervisor, the city's Engineering Department, and AEP Ohio's Business Incentive Team.

During a 10-year period, Canton installed LED traffic signals at 175 intersections and retrofitted LEDs into 85 backlit street signs and 1,405 decorative street lamps.

Yes, there were substantial cost savings. And, the flattering white glow of the street lamps put Canton in the best possible light. "The new LEDs give the city a feeling of vibrancy," said City Engineer Dan Moeglin. "We often get comments about how much better they look."

Perhaps the biggest dividend of Canton's switchover to LED lights was increased safety for motorists, pedestrians and city employees.

The new street lights enhance visibility—those out for an evening stroll can see their surroundings much more clearly. There's also a larger illumination footprint that reduces unlit areas. Since they use so little energy, the lights can be left on longer into the night. The overall sense of safety the lights provide has helped revitalize Canton's West Park neighborhood along 12th Street.

Traffic lights are easier for motorists to see even during periods of low sun. Since the new lights require little or no maintenance, the need to put work crews at risk while disrupting vehicular and pedestrian traffic is virtually eliminated. "It was common to receive a call every day regarding a malfunctioning traffic signal or street light. Those calls have dropped to

one per week," said Serban. The city also has replaced traffic signal controls with sophisticated new technology designed to reduce accidents and energy usage.

Over the course of the installations, Canton has seen nothing but plummeting electric bills. "We have seen a substantial monthly savings in our energy bills and the City Council has seen it too. Each year, they have been able to budget less and less money for the city's electric bills," said Serban. "In fact, our City Council is reinvesting the savings into more energy efficiency measures with the incentives earned from AEP Ohio."

Traffic Engineer Eduardo Molina, who has worked alongside Serban and Moeglin to make the municipality more energy efficient, is spreading the word. "When I'm asked if I have any advice for an energy efficiency project, I have a simple answer," he says. "I tell them to do the project. Find the money and do it. It will pay for itself—and in a shorter time with the incentives from AEP Ohio." ■

By the numbers

City of Canton

Total Project Cost
\$645,064

Incentives Paid
\$71,238

Annual Energy Savings
\$131,925

Project Payback Time with AEP Ohio Incentives
4.3 years

Value Added
**Safety for citizens;
reduced maintenance**



New school efficiency

Unique energy usage inspires innovation

“Thanks to AEP Ohio’s data center incentives, we aced every efficiency test.”

Joel Mengerink, Superintendent, Continental Local Schools

With their lengthy shutdown periods and large-scale lighting and HVAC needs, school buildings respond beautifully to a variety of solutions.

Two school districts that recently took advantage of AEP Ohio Business Incentive Programs were Continental Local Schools, a rural district in northwest Ohio, and Dublin City Schools, a large suburban district just northwest of Columbus.

Continental plays it cool in the data center

What’s the coolest place to be in any high school? Usually, it’s the data center.

That coolness comes at a heavy price, as the servers require a chilly environment, generating huge electric bills.

“At a district our size, every penny counts,” said Joel Mengerink, superintendent at Continental Local Schools.

Continental had used a massive 270-ton chiller housed at a campus central plant to keep the data center cool. It had to run constantly, and vast areas of the 92,000 sq. ft. school building were cooled when unoccupied during evenings and weekends.

Fortunately, AEP Ohio’s Data Center Energy Efficiency Team had an answer. They recommended the installation of a dedicated cooling unit sized for the 1,200 sq. ft. data center, with 50 percent of the cost covered through an incentive from AEP Ohio’s Data Center Incentive Program. According to recent figures from the U.S. Department of Energy, data center efficiency projects can reduce electricity consumption by more than 80 percent.

At Continental, the dedicated cooling unit’s impact was felt immediately by dramatically lowering operating costs. And the incentive from AEP Ohio cut the project’s payback period in half.

“Thanks to AEP Ohio’s data center incentives, we aced every efficiency test,” exclaims Mengerink. “It allows us to spend our resources on educating our students.”

By the numbers

Continental Local Schools

Incentives Paid

\$31,158

Annual Energy Savings

\$27,099

Annual kWh Savings (estimated)

270,998

Value Added

Savings applied to education; community goodwill



Dedicated cooling unit for **Continental Local Schools** in Continental, Ohio



Dublin Schools: Efficiency takes center stage

The city of Dublin is northwest of Columbus, and it has been a suburban boomtown since the 1980s.

The Dublin City School District has naturally grown along with it, encompassing 20 school buildings, nearly 15,000 students and 1,800 teachers and staff. Its electric consumption rivals a large university or small town. Many of the district's buildings predate modern energy efficiency technology, as they were built in the 1980s and '90s.

However, large energy consumption provides more opportunities for big savings, which is exactly what the district has done in conjunction with AEP Ohio's Business Incentives Program.

The best evidence that Dublin has made the most of its savings opportunities are found in one stunning statistic: the district's power bills are lower in 2016 than they were 20 years ago. This is in spite of the fact that several new buildings have been built, and that new technologies (computers, monitors, etc) have greatly increased the demand for electricity.

Since 2009, Dublin City Schools has saved 8,504,257 kilowatt hours (kWh) in electricity and earned \$288,001 in incentives from AEP Ohio. It did so by replacing inefficient lights and steam boilers, installing a multitude of controls (lighting, HVAC, vending, etc.), implementing a district-wide energy management system and much more.

"It takes a lot of planning, people and communication to pull all of this off," said Jeffery Krouse, who spearheads many of the efficiency efforts in his role as HVAC/maintenance supervisor for Dublin Schools.

The most recent energy efficiency installation was replacing the house



Jeffery Krouse shows off the energy efficient house lights at the Dublin Scioto High School Cultural Arts Center

“It takes a lot of planning, people and communication to pull all of this off.”

**Jeffery Krouse, HVAC/Maintenance Supervisor,
Dublin City Schools**

lights in the stage area at two of the district's cultural arts centers. The old-tech quartz and high-pressure sodium lights were replaced with dimmable LEDs. Krouse said the installation was handled with his in-house team.

"And we're not done. We're always on the lookout for more ways to save energy," adds Krouse. With such outstanding efficiency performances, it's no wonder that efficiency has taken a starring role on center stage at Dublin Schools. ■

By the numbers

Dublin City Schools

Incentives Paid

\$340,523

Annual Energy Savings

\$393,361

Annual kWh Savings (estimated)

3,933,612

Value Added

**Savings applied to education;
community goodwill**



Unexpected dividends at PNC Plaza



Upgrades reduce strain on budgets and eyeballs

When Arthur Goldner & Associates (AGA) selected Rick Aronhalt to manage their PNC Plaza property in Columbus, he saw a golden opportunity to drastically reduce the strain of operating expenses for the 23-story, 358,000 sq. ft. office building.

Aronhalt knew the value and benefits efficient lighting could bring to the management company, the tenants, and the environment, while increasing overall property value. While the CFLs installed at the time reduced energy costs over incandescent bulbs, LED lighting provided an even greater opportunity for energy savings.



He huddled with AEP Ohio's Business Incentive Team and lighting efficiency specialist, Green Light National, to design a solution.

A \$60,000 incentive from AEP Ohio's Business Incentive Program helped reduce up-front costs, while new LED technologies eliminated the need for expensive ballast replacements.

The Green Light National team worked evenings and weekends during a 30-day period, converting 7,499 lighting fixtures in the office building and the garage.

The results were impressive. AGA was happy with the reductions in up-front and operating costs. "We've cut our electric consumption

from lighting by nearly 60 percent," said Aronhalt.

As for the tenants, they were delighted with the reduced eye strain and greater sense of safety that came with the new lighting. "Recent studies have shown that buildings that converted to LED lighting attract more tenants, because they feel that the ownership is more active," says Adam Glod of Green Light National.

"It was the epitome of a win-win-win," said Aronhalt, who is on the lookout for more efficiency upgrades funded with incentives from AEP Ohio.

Aronhalt is planning additional lighting and exit sign upgrades, occupancy sensors and cooler roof technology.

By the numbers

PNC Plaza

Total Project Cost
\$485,000

Incentives Paid
\$60,000

Annual Energy Savings (estimated)
\$66,011

Annual kWh Savings (estimated)
660,119

Electric Consumption Reduction
60%

Value Added
Customer comfort; added merchandise appeal

“Recent studies have shown that buildings that converted to LED lighting attract more tenants, because they feel that the ownership is more active.”

Adam Glod, Green Light National

"It's more than good stewardship of the environment," he says. "I also want to show other property managers that energy efficiency can be done successfully and save you money." ■

Small Business Spotlight

Mannino's Grand Slam

An upgrade to LED lighting literally covered all the bases for Mannino's Grand Slam, central Ohio's leading provider of indoor softball and baseball batting cages, private lessons, fall and winter leagues, camps, clinics and cage rentals.

Prior to its lighting makeover, Mannino's used more than one hundred 400w metal halide high bay light fixtures to illuminate the 18,000 sq. ft. facility. The out-of-date fixtures guzzled electricity and were expensive to maintain, costing about \$3,000 per year for lamp and ballast replacement plus labor costs. The fixtures also took about 20 minutes to come up to full brightness.

“As a small business, we couldn't have done this upgrade without the incentives from AEP Ohio.”

Brian Mannino, Owner,
Mannino's Grand Slam

The old technology caused dark places in nooks and crannies throughout the facility. This was especially troublesome in the batting cages, where shadows created difficulty in seeing the ball, safety issues and customer complaints.

“Those shadows were the one thing that customers complained about,” said Owner Brian Mannino. “And our goal is to provide the best playing experience for every ballplayer.”

With an assist from Spectrum LED Solutions and AEP Ohio's Business Incentive Programs, the lighting system was made over with LED technology. “As a small business, we couldn't have done this upgrade without the incentives from AEP Ohio.”

From the batting cages to the business office, the benefits were seen and felt immediately throughout Mannino's.

“Customers noticed immediately something was different,” said Mannino. The cleaner, more balanced light of the LEDs creates fewer shadows so batters can see the ball better. Customers who once had to wait for the old lights to warm up appreciated the “instant on-off” of the LEDs.

Another instantaneous change was the lower electric bills, as Mannino's electric usage dropped more than 80 percent. The new bulbs have a 10-year warranty and don't require the use of ballasts, virtually eliminating maintenance costs.

With reduced costs, enhanced aesthetics and improved player experience, this lighting upgrade truly covered every base for Mannino's Grand Slam. ■



Community Focus

The Discovery District in Columbus

A convergence of culture, art and academia, the Discovery District is an area of enrichment along the northeast crescent of downtown Columbus.

Often referred to as the city's "creative campus," the area is home to the Columbus Museum of Art, the Columbus College of Art and Design, Columbus State Community College and the Columbus Metropolitan Library.

Recently, the District enriched itself in another way by participating in AEP Ohio's Community Energy Savers Program. The program works with communities to encourage residents and businesses to participate in energy efficiency programs offered by AEP Ohio. Not only do community members benefit from saving energy and money in their homes and businesses, their actions also help the community receive incentives from AEP Ohio that can be put toward an improvement project identified by the community.

Working with the Discovery District, AEP Ohio established a goal of 100 participants by the end of June 2015. The District exceeded the goal and received \$10,000 to use toward energy efficiency projects at the Thurber Center, Kelton House and Kappa Kappa Gamma.

Remaining funds will be used for a celebratory event to further promote sustainability. And AEP Ohio will provide a sustainability Roadmap that will provide a framework for their ongoing sustainability initiatives.

For more information on how your community could possibly participate, visit AEPOhio.com/ItsYourPower. ■





Nine industrial energy wasters

1 Unnecessary Running or Idling

Powering down equipment, motors and lighting during nonproductive or inactive periods saves energy. Turn off, or dial back equipment to minimum levels on weekends, nights, breaks and downtimes. Install automatic sensors and timers to automate the process.

2 Leaks

Identify and fix any and all leaks. Whether it's heat, steam, vacuum, water or compressed air, any leak wastes energy.

3 Friction Loss

Check filters, outlets, inlets, nozzles and transfer services such as coils and radiators. Clean them systematically and regularly.

4 Sub-Optimized Efficiency

When you're using redundant, old or worn out equipment, or your equipment is poorly maintained, you are operating at a sub-optimal level.

5 Malfunctions

Broken equipment uses more energy. Excessive vibration, heat and noise are the best indicators of a malfunction.

6 System Imbalance

Most systems are oversized to respond to peak or worst-case conditions, yet often run at a constant rate. Make sure your systems can respond to requirement variations.

7 Misapplication

Sometimes, the wrong piece of equipment is used to do a repetitive task, for example, when compressed air is used for drying when there's a less expensive option available.

8 Underutilization

Scheduling choices and constraints affect energy usage. Last minute changes and rush orders reduce process and energy efficiency. Underutilizing equipment creates excess capacity, which means increased fixed costs in products relative to generated revenue.

9 Traditional Lean Waste

Traditional lean waste consumes energy without adding value. Product overprocessing, excessive material handling and excessive scrap or rework are just a few traditional lean wastes. Reducing these wastes can result in energy savings.



Industrial energy tips: compressed air

- **Turn off systems during evenings and weekends:** Most compressed air systems only run at or near full capacity between 60-100 hours of a 168 hour week. Turning off the systems during downtimes (depending on shift patterns) can reduce energy bills up to 20 percent.
- **Fix existing leaks:** A quarter inch leak at 100 pounds per square inch will cost over \$2,500 per year. And, systems over 5 years old have about 25 percent leakage. 80 percent of air leaks are not audible, so it pays to have third-party help to find them.
- **Prevent new leaks:** Check the inside of your piping system to make sure it's clean and dry to ward off any corrosion issues. Dirt and moisture create sludge which can corrode the system very quickly, causing pressure drops and increased risk for product contamination.
- **Don't run above recommended pressures:** Each 2 pounds per square inch reduction reduces energy usage a percentage point. Keep an eye on the system pressure and resist the temptation to increase it to compensate for pressure lost due to leaks or clogs. A central supply side controller can greatly reduce the operational pressure band and increase efficiency.
- **Check condensate drains:** Drains on timers should be adjusted regularly to assure that they're working properly and not stuck open. Consider replacing timer drains with zero-loss drains to stop compressed air waste.
- **Review piping infrastructure and make sure it's optimized:** The piping system design should optimize transfer of the compressed air at the desired flow and pressure to the point of use. Increasing the size of a pipe an additional two to three inches can reduce pressure drop up to 50 percent. Shortening the distance air has to travel can further reduce pressure drops another 20-40 percent.
- **Change ALL filters on schedule:** Change them systematically versus "every once in a while." Check the entire system, from the compressor room to air-line and point-of-use filters.
- **Recover heat and reuse it:** Compressed air generates heat, and up to 90 percent can be recovered and redirected to heat water and supplement HVAC systems.
- **Emphasize proper maintenance:** Proper, regular compressor maintenance can reduce your energy costs 1 percent, and helps prevent breakdowns that cause expensive downtime and production loss.
- **Identify inappropriate use:** Compressed air usage can be inefficient when used for such applications as cooling, where non-compressed air can work just as well and is far less expensive.

Business Energy Tips

Switch to LEDs: LEDs last up to 10 times longer and use at least 75 percent less energy than incandescent lamps while providing better light. They work in practically all applications and their price has come down significantly.

Install lighting controls: Depending on baseline conditions and the strategies used, lighting controls can reduce lighting energy use by up to 60 percent.

Cut down on over-lit parking lots: High efficiency light sources and occupancy-sensing lighting controls can cut energy usage by up to 40 percent.

Install advanced rooftop unit controllers: Retrofitting advanced rooftop unit controllers in place of existing old ones improves functionality and offers potential savings of up to 20 to 50 percent.

Commission your building: When done well, a commissioning or retrocommissioning study can yield energy savings and increase occupant comfort in a building by improving the energy system's performance. For a standard 50,000 sq. ft. building, commissioning can often uncover around \$17,000 in annual savings.



Ready to **SAVE?**

AEP Ohio's Residential Energy Efficiency Programs allow you to save significantly on your electric bills with no sacrifice in comfort.

For example, take advantage of our hassle-free Appliance Recycling Program, and have your old working refrigerator or freezer removed free of charge. Then, receive a check to help offset the cost of a new energy efficient refrigerator that can save you up to \$150 annually in energy costs.

And, you can choose rebate programs on other energy-efficient appliances and lighting, or opt for one of our In-Home programs that provide tailored recommendations to help you save money and energy.

If you're looking to save, turn to AEP Ohio's Energy Efficiency Programs. Visit AEPOhio.com/ItsYourPower.

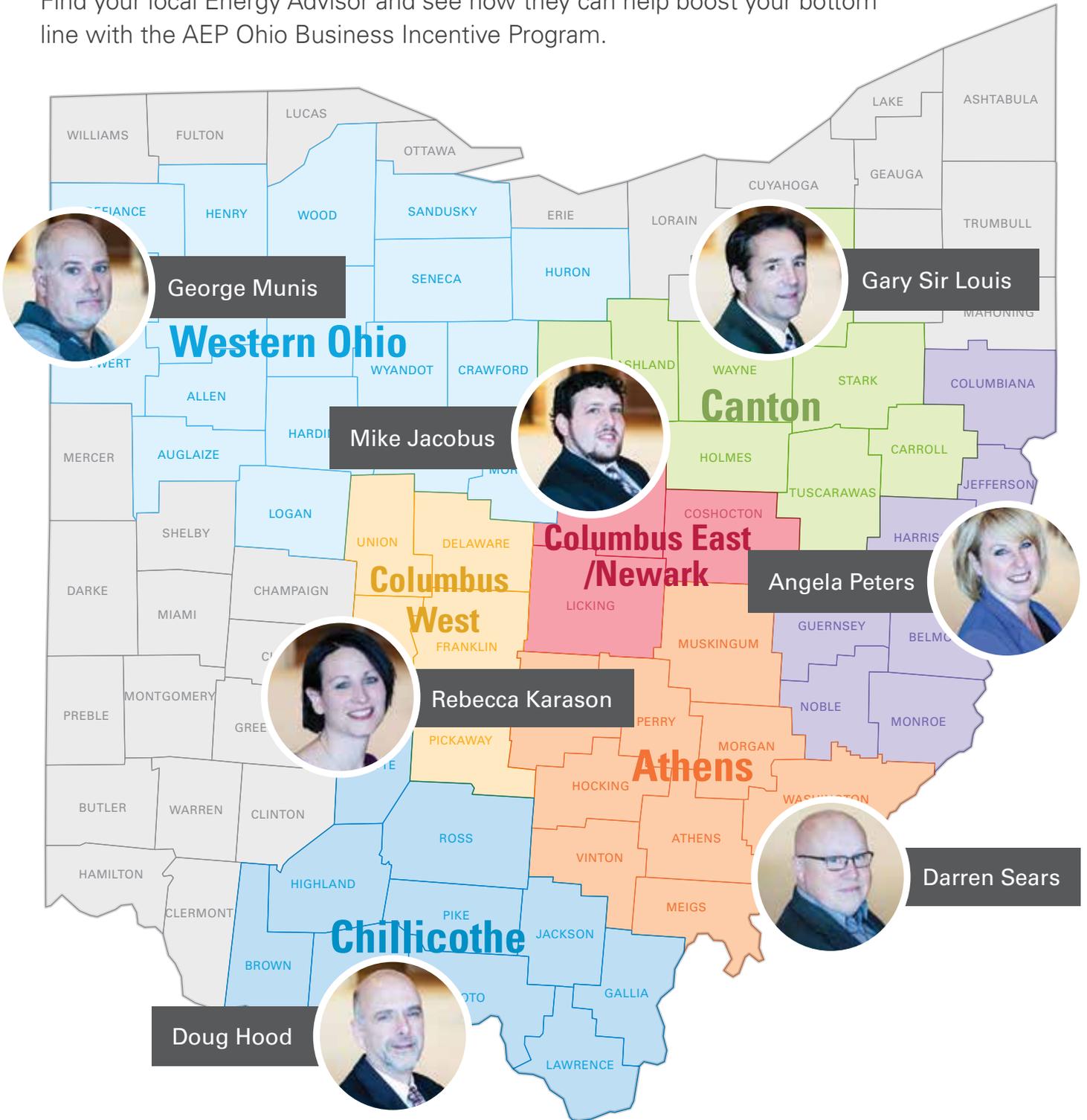
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Get in touch.

Contact our Business Outreach team at **614-610-9649** or aepohiosolutions@clearResult.com.



With today's LEDs, your lighting will last longer than many marriages.
Make sure you don't walk down the aisle with a cheap date.



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