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The Community Energy Planning Project

Energy is a topic that affects every household, business, and organization in the community. Yet, it's so ever-present that it's often taken for granted. Energy is rarely featured as a topic in communities' strategic or comprehensive plans. Because of this, local priorities regarding energy remain largely unexplored.

OKI received grant funding to produce Community Strategic Energy Plans for eight interested local communities in southwest Ohio. To produce these plans, OKI partnered with the Greater Cincinnati Energy Alliance. The grant award also included $120,000 as a fund dedicated to implementing objectives of the eight plans.

These plans are generally based on content from the US Department of Energy's guide entitled *"Community Greening: How to Develop a Strategic Energy Plan."* However, OKI worked with each of the local governments to tailor each plan to the local community's situation; and each plan featured robust public input.

Ways this project benefits the local Community and the Region:

- Builds awareness of how energy affects local communities and ties into traditional community planning topics like transportation, housing, economic development, and natural systems
- Develops a knowledge base, data, and indicators that can be used to understand energy impacts throughout the region
- Provides funds to kick-start the implementation of the plans
- Builds stronger awareness of local priorities regarding energy, which is expected to lead to further local and regional activity on energy issues

Energy Use in the Village of Cleves

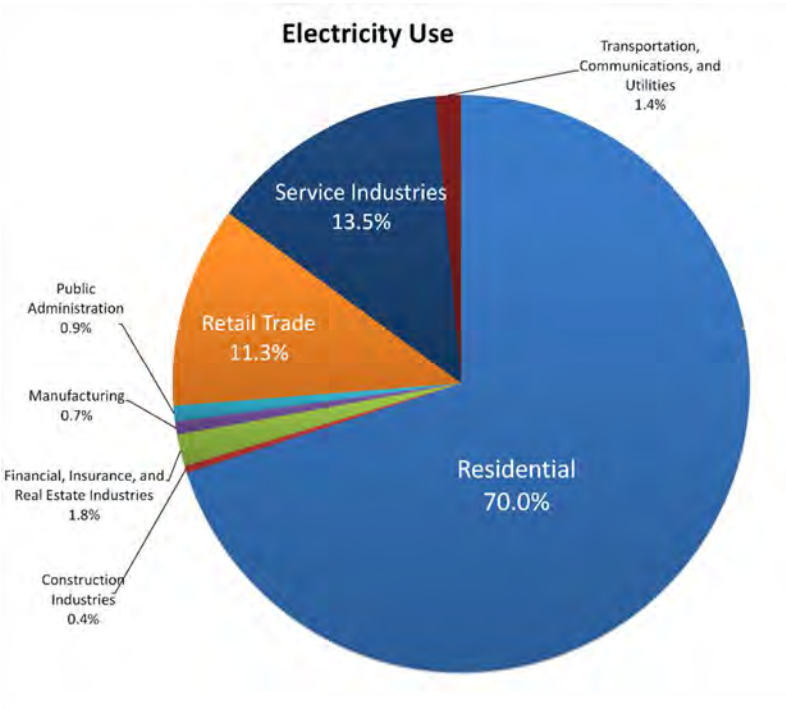
Cleves, Ohio is a village situated to the west of Cincinnati in Hamilton County. Located near the confluence of the Great Miami and Ohio Rivers, State Route 50 runs directly through the center of the village. The village covers an area of 1.58 square miles.

The village features a business district along Miami Avenue. The district includes a diversity of businesses, including restaurants, a hardware store, gas station, and some offices. There is also a branch library and senior center.

Cleves has a wide variety of housing, from 19th Century houses in the core community along Miami Avenue, to modest homes from the postwar era through the 1980's to modern subdivisions built in the 2000's. Most of the Village's housing is single family (83.7%), but an increasing amount of housing is multi-family (2 or more unit structures). The percentage of overall housing that is multi-family is growing from 8.7% of structures in 2010 to 15.5% in 2016. Likewise, the percentage of renter occupied housing in the village has also increased from 26.8% in 2010 to 31.7% in 2016.

Like the village's housing, its residents also show diversity. The Census Bureau estimates the total population count to be 3,371 in 2016; a modest growth from the count of 3,115 registered in the 2010 census (a 1.3% annual growth rate). The village's population is getting younger, as median age has fallen from 36.1 in 2010 to 34 in 2016. This has been accomplished both through an increase in percentage of residents under 18 years old, and a reduction in percentage of residents over 65.

Median household income in the village is $64,848 per year. 15.6% of households earn less than $25,000, while 28.6% earn over $100,000. Also, the unemployment rate has shown marked increase since 2010; being 4% in 2010 and 9.3% in 2016. In fact, the unemployment rate has been over 9% every year since 2014; this after being below 4.5% from 2010 through 2012. Despite this, the poverty rate in the community showed a slight decrease between 2012 and 2016, while the rate of childhood poverty showed an even more significant drop.

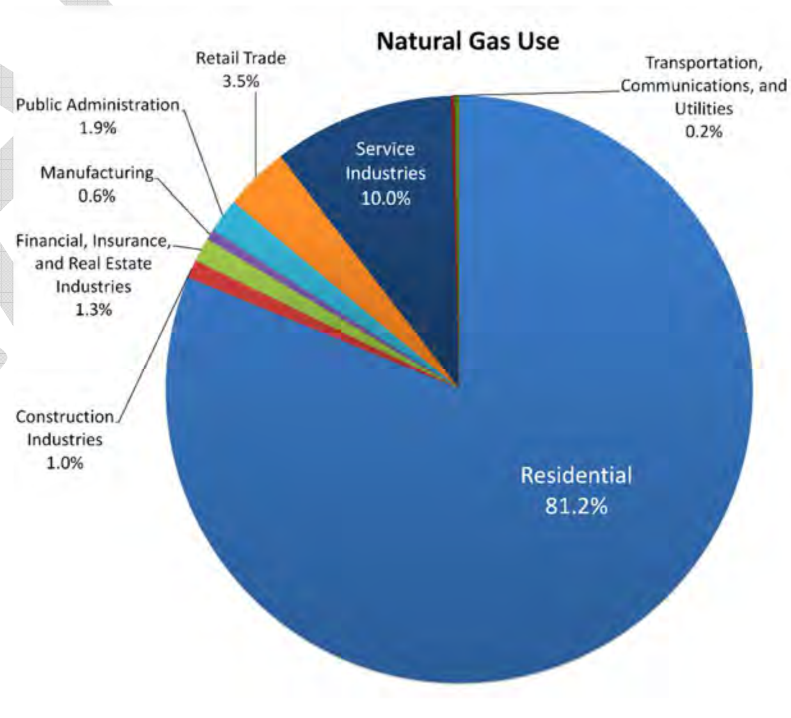


Energy use in the village is dominated by residential. Overall electric use in Cleves is 29,715,515 kWh per year. Total natural gas use in the village is 872,048 CCF per year. Service industries and retail are the second and third most energy users. It is important to note that the service industries category includes schools, and the new Three Rivers Schools campus is a significant portion of the energy use included in this category.

These figures serve to illustrate which land uses make up the majority of the village's overall energy picture. This can inform priorities when deciding between efficiency initiatives that target different users. These figures also stand as a community baseline used to measure the impact of future energy efficiency initiatives in the community.

Transportation Energy Use

Measuring the use of energy for transportation for a local community is a very difficult task. The variety and number of vehicles, trips both in and outside the community, and fuel sources make gathering meaningful direct data nearly impossible. The solution we opted for is to look at means of



transportation to work gathered by the US Census Bureau as part of the American Community Survey. This data is available for any local political jurisdiction. This data can be tracked for changes over time, and can be compared with other communities.

The data we are interested in is the percentage of workers living in a community who opt to commute in a way which saves energy – by carpooling, riding the bus, biking, walking, or working from home. It should be recognized that some workers may commute to work via the above means for reasons other than conserving energy. Never the less, these means of travel are more energy efficient than commuting to work alone in a car, which is how the majority of people commute.

The table to the right illustrates how the residents of Cleves commute to work compared with residents of selected peer communities and residents of Hamilton County as a whole. The peer communities selected were Addyston, North Bend, Hooven, Delhi, Whitewater, and Miami Townships.

On the surface, it appears that Cleves performs slightly worse in key categories compared to the peer average. However, the advantage of the peer community average in each category is driven by a different community. For example, Delhi's 1.4% of workers commuting by public transportation drives the peer community average of 0.94% use of public transportation. Delhi's strong showing in this category is likely driven by the relatively good access to bus lines in the eastern portion of the township. The rest of the peer communities post similarly low rates of bus use as Cleves.

Means of Communiting to work

	Cleves	Peer Communities	Hamilton County	Regional Average
By Car	95.3%	92.7%	87.8%	90.8%
Carpooling	10.6%	10.0%	8.1%	8.0%
Public Transportation	0.0%	0.9%	3.7%	2.0%
Walking	0.7%	1.5%	2.9%	2.1%
Bicycle	0.0%	0.1%	0.3%	0.2%

The only category where Cleves is notably outperformed by nearly all the surrounding peer communities is the rate of people who walk to work. All the peer communities beat Cleaves' 0.7% with all but North Bend and Miami Township meeting or exceeding the peer average of 1.5%. Cleves is a relatively walkable community with sidewalks and ample crosswalks throughout the business district and adjacent housing. The areas of housing on the west side of US 50 and on top of the hill remain cut-off from the business district due to the difficulties of persistent traffic and elevation respectively. All of the pedestrian accessible portions of the village are served by sidewalk.

One recent change in transportation options had a negative effect on Cleves residents opting to commute using energy efficient means. In 2012, the 50X Metro Express bus route was shortened to Saylor Park. This route used to serve Cleves. At the time of this change, nine residents regularly rode this route, while in 2013, just after the change, no Cleves residents reported regularly riding the bus to commute to work. Without a bus option, Cleves residents have little option other than to drive downtown. Metro has been in the mode of pairing back service and routes over the past decade, so the situation in Cleves is not unique. If Metro shifts into expansion mode, the village should be welcoming of a reinstatement of bus service in Cleves.

Municipal energy use is covered in the section titled: Cleves Facility Assessment on page XX.

As a land use, Residential is the largest energy user, and thus offers the largest potential for reducing energy use. However, reaching this potential would require reaching the approximately 1,200 households in the village.

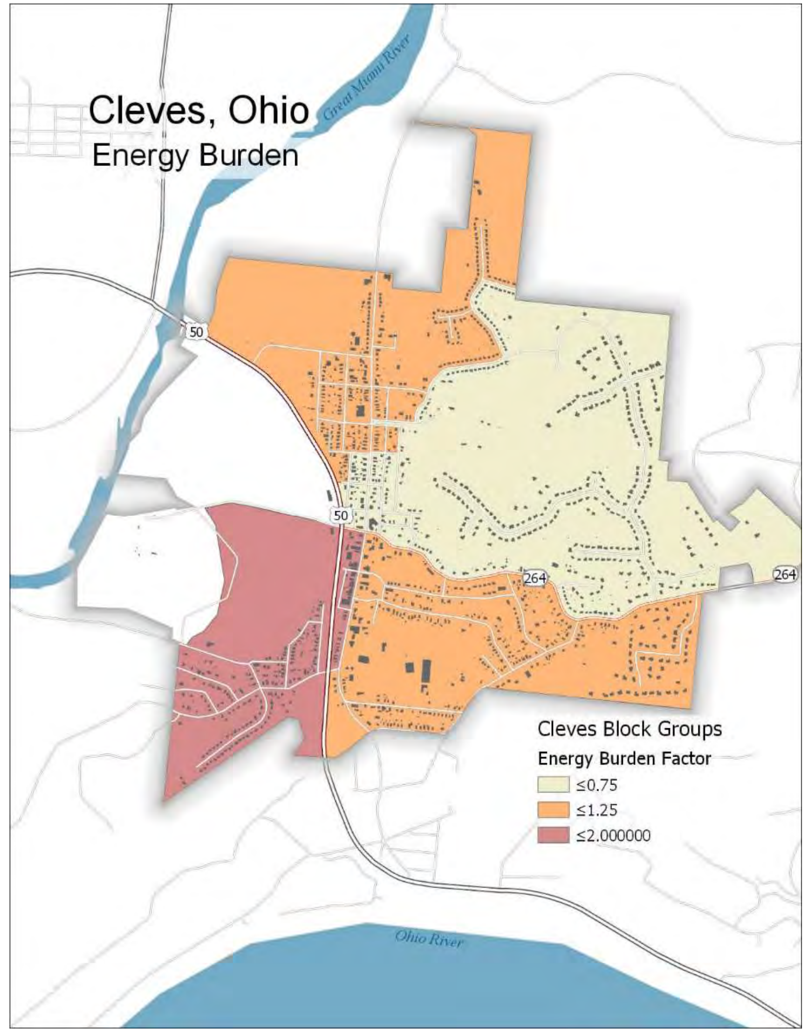
Given the data available for analysis, the Three Rivers School District, with the new school campus, the older Charles C. Young Building, and a fleet of school busses, appears to be the largest single entity energy user in the village.

Energy Burden

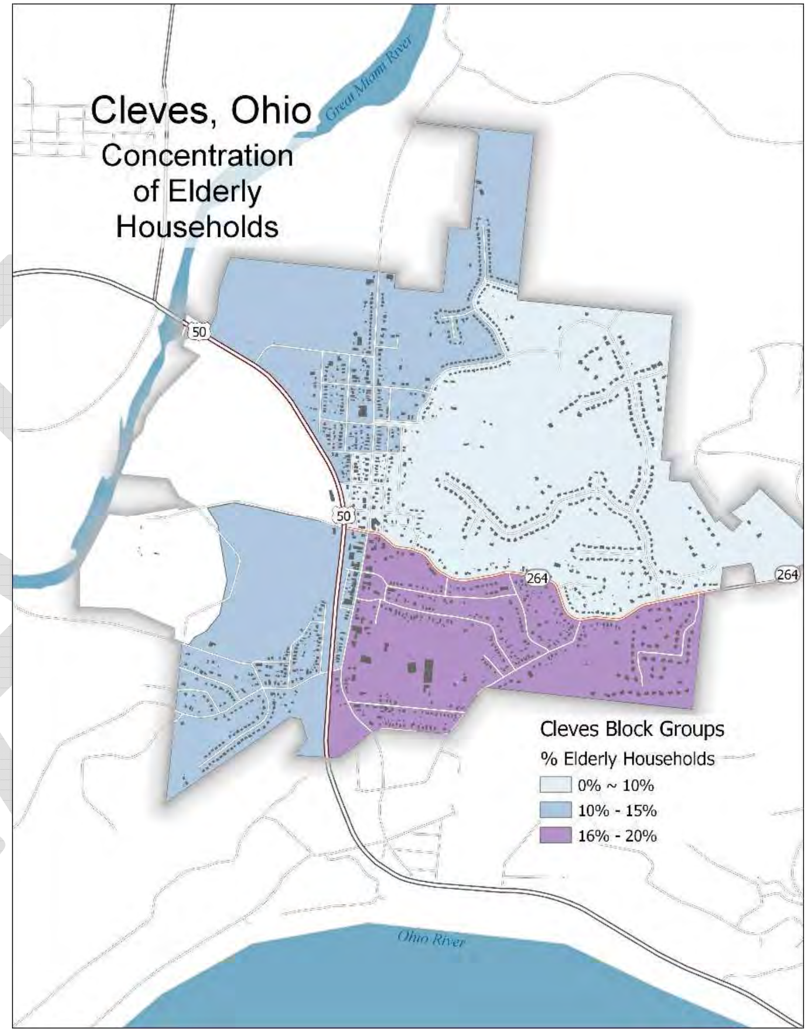
Energy burden is the percentage of a household's total income that is spent on energy. The higher the percentage, the higher the energy burden. This measure illustrates how the impact of high energy prices and inefficient housing are disproportionately felt by different population groups or households in different parts of the community. This information can be used to guide efforts to specifically reach out to households with high energy burdens with programs that can improve energy efficiency and costs.

Energy burden was measured by combining the average electricity and natural gas sales in a census block and dividing by household income. The result was then divided by the community average. Values over one indicates an average household energy burden greater than the community average. Values less than one indicate energy burden that is less than average.

The prevalence of energy burden in Cleves is worst in the southern half of the community, as seen in the map to the right



We also looked at populations that sometimes coincide with energy burden. In Cleves, these groups are low-income and elderly populations. As expected, the areas of highest energy burden correspond to the areas of highest concentrations of low-income households. It was also found that areas with higher concentrations of senior population also experience higher energy burden.

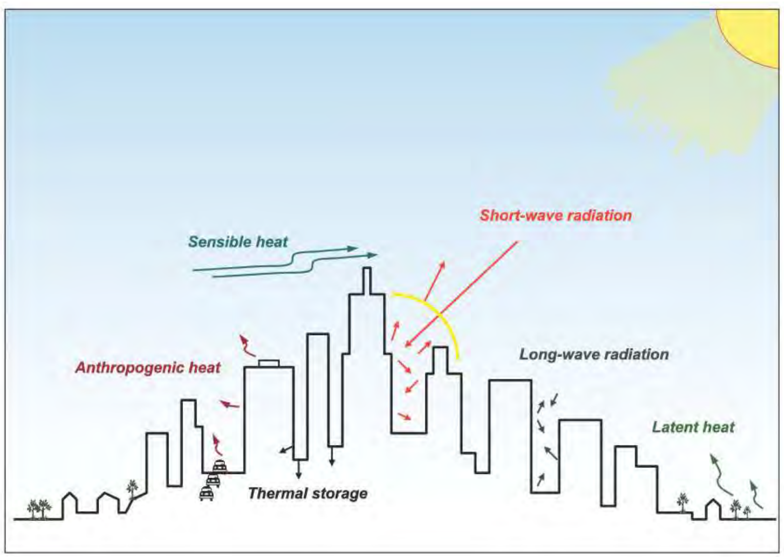


Reducing energy burden in the community is a two-pronged strategy of reducing the amount of energy used by affected households, and also reducing the cost of energy. To reduce the amount of energy used by households with high energy burden, investments must be made in improving the energy efficiency of the dwelling and equipment used in the home. Reducing the cost of energy can be done through aggregation deals and with income-based energy cost assistance programs.

Energy efficiency improvements to the home can vary widely in cost and return on that investment. A more detailed look at the scope of these improvements can be found beginning on page XX.

Urban Heat Island

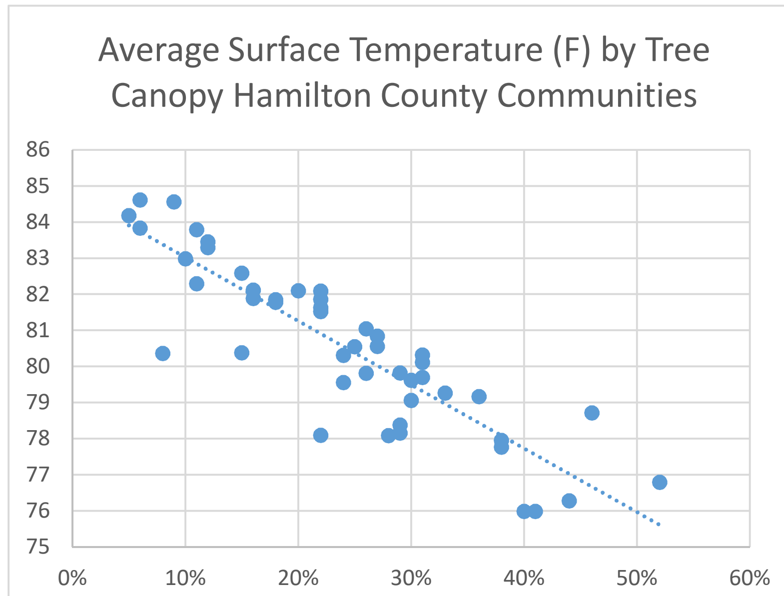
The urban heat island effect is created by impervious surfaces, like roads, parking lots, and buildings, which retain heat from the sun's radiation. Then during the night, these surfaces release that heat, creating a localized area of higher temperature. Together, all of these localized "hot-spots" in the urbanized area create a dome of hot air over a metropolitan region. This phenomenon is important to energy because, in the summer, it causes air conditioners to run more often, and for longer periods of time due to the increased air temperatures.

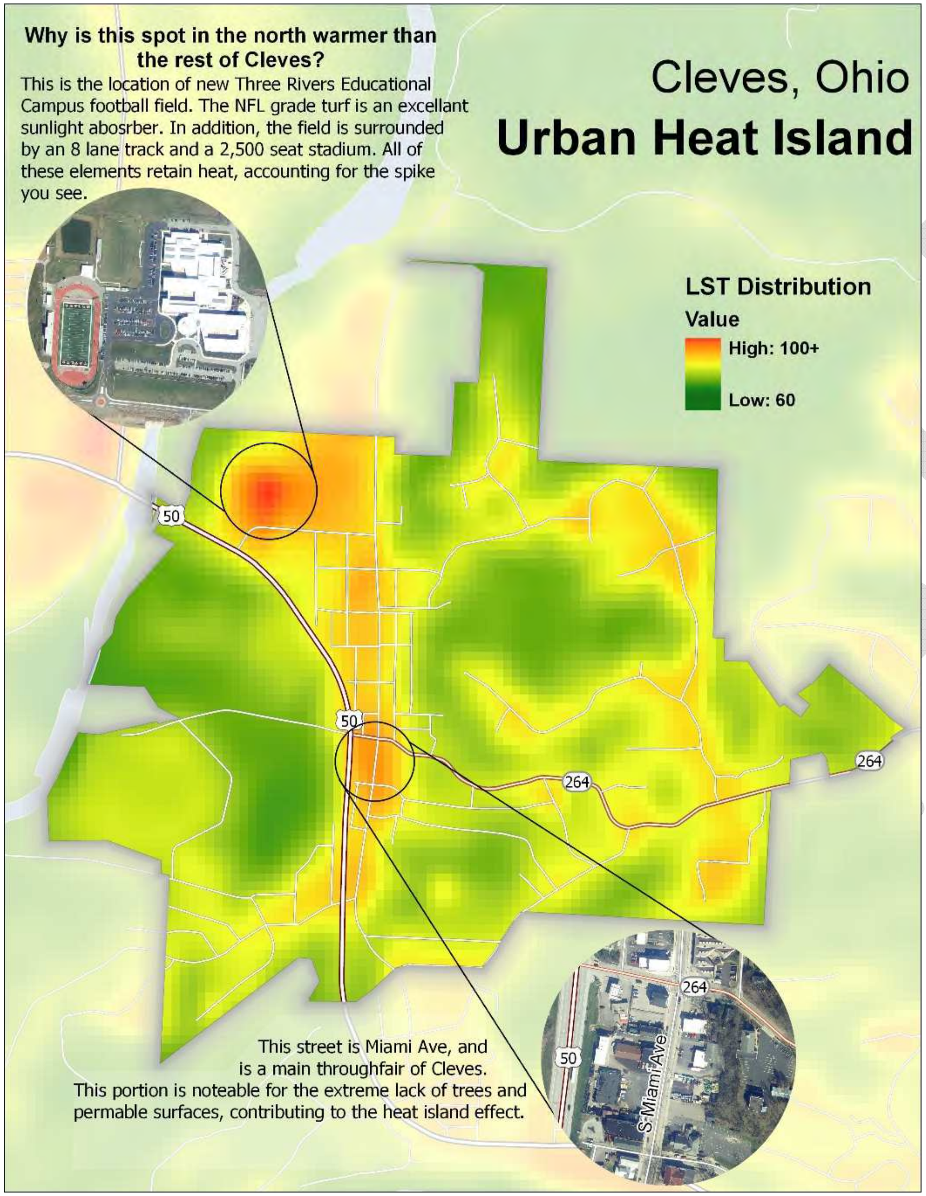


Source: US EPA

The map on the next page shows average land surface temperature which corresponds to intensity of the urban heat island effect. You can see the streets and parking lots show up in yellow to red tones indicating elevated surface temperatures. The hottest spot in Cleves is the synthetic turf football field at the new Three Rivers School complex.

Areas that have tree cover show cooler tones. In fact, the prevalence of tree cover in a community is found to be the leading indicator of heat island effect. The chart below shows the clear relationship between the two.



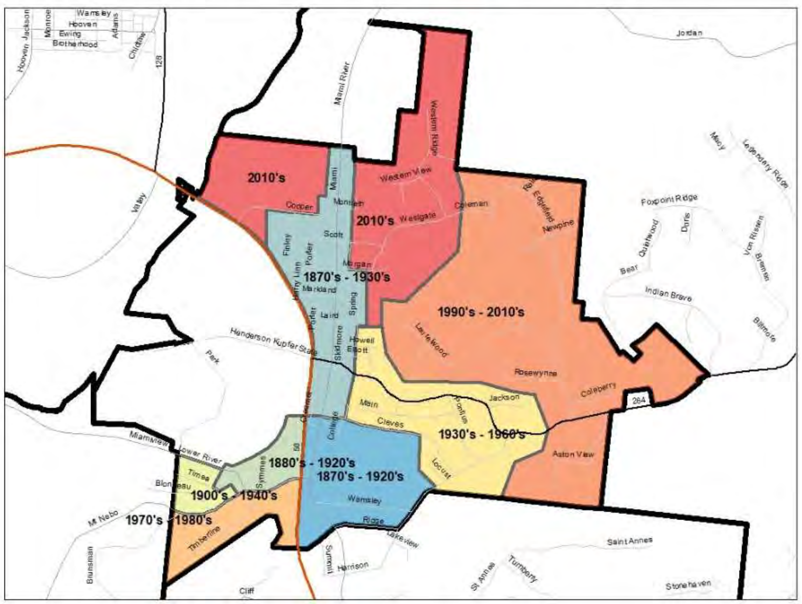


The best ways to combat the urban heat island effect is by limiting the amount of large impervious surfaces like roofs, streets, and parking lots within the urban landscape; and by reducing the amount of heat absorbed by these features by using light colored coatings and providing as many deciduous shade trees as possible in their vicinity.

Residential Energy Efficiency

The Village of Cleves contains a diverse housing stock that has developed over time. The oldest homes can be found near the historic business district with newer housing developments surrounding the historic core. In general, each development contains homes that were built during the same era that share similar characteristics. These characteristics help to define the energy efficiency of the home and dictate the type of improvements required to improve efficiency. This section provides an analysis of the most important efficiency improvements recommended for certain eras of residential structures in the Village.

Cleves - Predominant Building Age



- **Pre 1940's**

  Homes built during this period were not designed with energy efficiency in mind so there are significant opportunities to reduce energy usage and improve comfort. The following characteristics are common in homes built during this period:

  Knob and tube wiring: Homes built during this period may contain knob and tube wiring which became widespread in the 1920s. This wiring does not meet current electrical codes and should be replaced. In addition, installing wall and attic insulation over existing knob and tube wiring can cause it to overheat and catch fire.

  Wall insulation: Whether the home is solid brick or framed with wood siding, exterior walls were not insulated during this period. Homes with wood siding used balloon-frame construction which results in stud cavities that are open to both the basement and the attic. These cavities can be insulated by dense packing the walls once all knob and tube wiring has been removed. Insulating solid brick homes is difficult due to the lack of wall cavities and the presence of plaster and lath walls. In these instances, insulation can be added by framing new walls on the interior of the home, installing insulation, and finishing with drywall.

Heating systems: Homes from this period were heated using hot water or steam boilers. If an older boiler is still in use, it should be replaced with a new is 95% efficient ENERGY STAR unit. In addition, all accessible distribution piping should be insulated. Asbestos was commonly used to insulate heating systems during the 1940s. It may be wrapped around boiler distribution systems or the boiler itself. Contact a professional to remove the asbestos or to ensure that it is properly encapsulated which will prevent the fibers from becoming airborne. Other homes from this period may have a forced air system that was installed at some point in time. Older furnaces should be replaced with an ENERGY STAR high efficiency unit. If natural gas is not available, then a ground source or air source heat pump should be installed. Duct work should be sealed with mastic and insulated if located in unconditioned space.

- **1950's and 60's**

The end of World War II brought with it a housing boom that extended well into the 1950s. Large numbers of Cape Cod and ranch style homes were built during this period. The following characteristics are common in homes built during the 1950s and 1960's:

Attic insulation: Energy continued to be cheap during the 1950s, so attic insulation was not commonplace. The second floor of Cape Cod style homes built during this period are often hot in the summer and cold in the winter due to the lack of insulation. The attics, slopes, and knee walls of Cape Cod style homes should be properly insulated to save energy and improve comfort. Ranch style homes are easier to insulate due to the open attic spaces and may have already had insulation added. ENERGY STAR recommends that attics in this region have insulation levels between R38 and R60.

Vermiculite is a lightweight brownish-gold mineral that became a popular insulation material in the 1950s. Unfortunately, most of the vermiculite used in insulation was contaminated with asbestos. If you suspect that your insulation is vermiculite, do not disturb it. Contact a qualified professional to test the insulation for asbestos. Vermiculite insulation must be removed before additional insulation is installed. Homeowners may qualify for financial assistance with removing vermiculite. Visit http://www.zonoliteatticinsulation.com/ for more information.

Windows: Home built during this period originally had steel or aluminum single pane windows which were viewed as an upgrade over wood windows. The windows were not designed to prevent air infiltration or to provide any insulation value. While replacement with modern energy efficient windows is the best solution, windows that are not replaced should be sealed and caulked to reduce infiltration. Storm windows are a more cost-effective option to replacement, but do not provide the benefits associated with new windows.

- **1970’s and 80’s**

Energy efficient construction methods became more common during the 1970s due to the energy crisis. However, energy codes were in their infancy so there are plenty of improvements that can be made to homes from this period. The following characteristics are common in homes built during the 1970s and 80s:

Basements and crawlspaces: Uninsulated rim joists allow cold air to enter the home. All exposed rim joists in basements and crawlspaces should be insulated and air sealed to prevent air infiltration. Wall insulation is recommended in basements that are used as conditioned space. However, any moisture issues must be addressed prior to insulating. When a crawlspace is present, either the ceiling or walls should be insulated. Fiberglass insulation installed in the floor joists should be covered with an air barrier. A vapor barrier should also be installed on the floor of the crawlspace to prevent future moisture issues.

Attic insulation: Attic insulation became standard in the 1970s with most homes having R-19 insulation when constructed. Additional insulation may have been added over time. Ductwork in the attic should be properly insulated. Attics connected to living spaces should have the connecting wall insulated as well. ENERGY STAR recommends that attics in this region have insulation levels between R38 and R60.

Vermiculite is a lightweight brownish-gold mineral that continued to be a popular insulation material in the 1970s. Unfortunately, most of the vermiculite used in insulation was contaminated with asbestos. If you suspect that your insulation is vermiculite, do not disturb it. Contact a qualified professional to test the insulation for asbestos. Vermiculite insulation must be removed before additional insulation is installed. Homeowners may qualify for financial assistance with removing vermiculite through the Zonolite Attic Insulation Trust.

- **1990’s and newer**

Energy efficiency became an integral component part of new homes construction methods in the early 2000s. Energy code requirements for insulated windows, higher R-rated insulation in the walls and ceilings, and a tighter building envelope began during this period.

Living spaces above garages: Many homes built during this period have living spaces located above the garage. If the living space is consistently cold in the winter, then the ceiling of the garage may not be insulated and sealed properly. Verify if insulation is present and install if needed.

Air sealing: Homes from this period can benefit from air sealing in order to reduce air infiltration. Penetrations and gaps in the attic plane such as electrical boxes, plumbing stacks, ductwork, chimneys, and chases should be sealed prior to adding additional insulation. All penetrations in the foundation should be properly air sealed. Any doors that are original to the home should be weather stripped. If the home is sealed too tight, then mechanical ventilation will be needed.

A number of programs exist to help homeowners improve the energy efficiency of their homes.

- **Duke Energy**
  Duke Energy offers a wide range of programs to help homeowners reduce their energy usage.

  Smart $aver: Rebates are available to help offset the costs associated with installing certain approved energy efficiency measures. As of 2018, Duke Energy offers rebates for heat pump water heaters, insulation and air sealing, variable-speed pool pumps, and high efficiency air conditioners and heat pumps.

  Home Energy House Call: Homeowners may request a free in-home energy assessment that will identify ways to improve energy efficiency.

- **State of Ohio ECO-Link Loan Program**
  The Office of the Ohio Treasurer of State works local lending partners to provide up to a 3% interest rate reduction for loans that are used to fund energy efficiency improvements. Additional information is available at www.ECOLink.ohio.gov.

- **People Working Cooperatively**
  People Working Cooperatively offers programs that provide weatherization assistance to homeowners and renters in Hamilton County that meet certain income guidelines. Assistance includes free energy audits, installation of insulation and air sealing improvements, lighting upgrades, as well as other efficiency related measures.

- **Zonolite Attic Insulation Trust**

  Homeowners that have asbestos-containing vermiculite insulation in their attic may qualify to receive financial compensation to offset the costs associated with removing the hazardous substance.

Homeowners who think they may have asbestos-containing vermiculite insulation should visit www.zonoliteatticinsulation.com for additional information.

Distributed Generation

Distributed generation refers to electricity that is generated, and in many cases fed to the electric grid, from sources that are dispersed throughout the community. The most common example of this are privately owned solar panels that provide energy for individual homes or businesses, but also feed excess power back to the grid through net metering. Distributed generation is also becoming a larger portion of the nation's energy generating capacity. In 2017, the US Energy Information Agency projected a 400% increase in solar distributed generation capacity by 2040, making it the fastest growing sector of new electric generation capacity.

Distributed generation offers several key benefits to a community. First, most sources of distributed generation are renewable – solar, wind turbine, or geothermal. Also, these energy sources provide power with no emissions. To be fair, there are also some distributed generation sources that are based on combustion and do involve emissions; such as municipal solid waste incinerators and gas turbine generators. Distributed generation improves the resiliency of the utility network because they lessen the chance of an event knocking out a critical portion of generating capacity on the grid. Finally, distributed generation, because it is located closer to the point of use, reduces line losses from the transmission of electricity over longer distances.

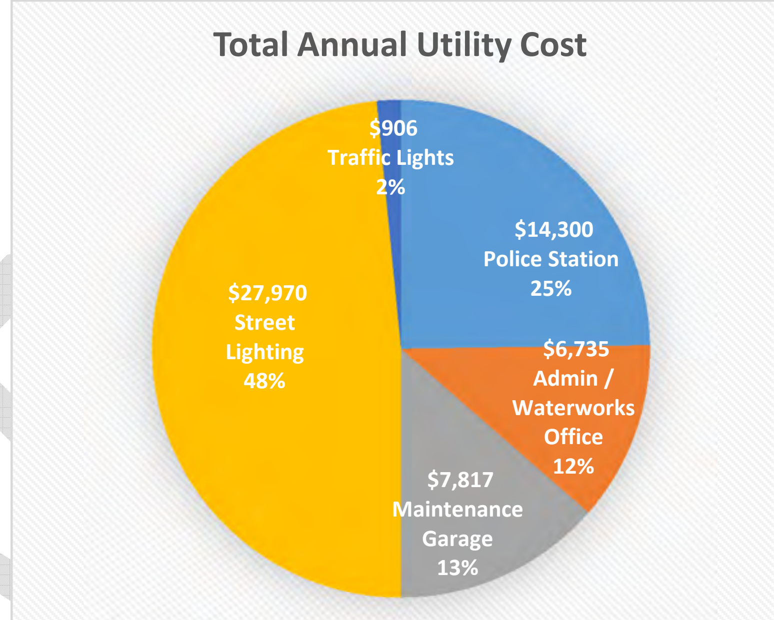
The public benefits of distributed generation are strong enough that the California Energy Commission now requires all new homes in the state be equipped with solar panels. Each new home and business adds to the need for new generating capacity, causing the existing power plants to work harder and, as a result, increasing air pollution. Once enough new homes and businesses are added a new power plant would be required to keep up with the demand. Solar panels can greatly offset the demand increase from new development, reducing air pollution and the need for additional power plants in the future.

Cleves Facility Assessment

This planning process included a walkthrough facility energy assessment of the four main village facilities – the Police Station at 101 N. Miami Ave., the Administration Office at 92 Cleves Ave., the Maintenance Garage on E. Miami River Road, and the Waterworks Facility on Kilby Road. The facility energy assessment was conducted by Energy Optimizers of Tipp City, Ohio. The assessment is based on 12 months of actual electric and natural gas usage information, and considered the buildings' envelope, including windows and doors, indoor and outdoor lighting, heating ventilation and air conditioning (HVAC), and water heating.

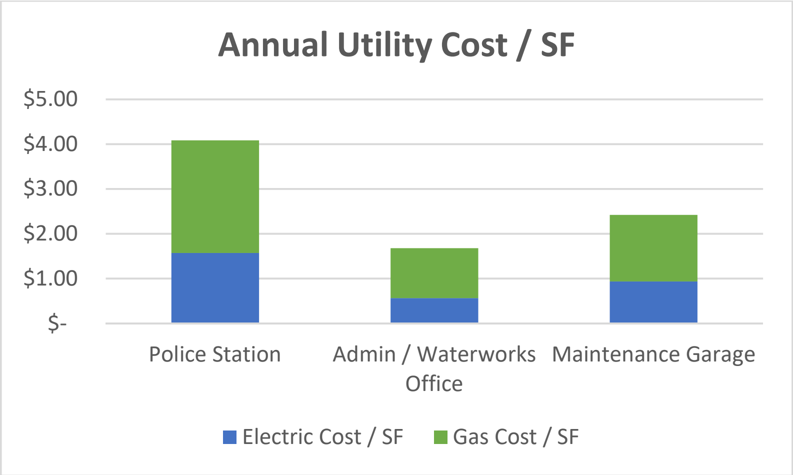
According to the report, the objectives of the assessment were to:

- Confirm heating fuel and electric use and costs for the facilities
- Analyze utility use based on building size
- Assess current levels and patterns of energy use
- Compare performance benchmarks with similar facilities
- Identify low-cost operational opportunities to reduce energy consumption and costs
- Identify capital project opportunities that would reduce energy consumption and costs



Police Station

The Police Station located at 101 North Miami is a 3,500 square foot office building constructed in 1960. The facility uses 129.09 kBtu/ft^2 compared to a national average of 120.1 kBtu/ft^2. This difference can be explained in part by the fact that the facility is in use 24 hours a day, 365 days a year while a typical office building is not. Even with this in mind, the analysis of the utility bills revealed that the kBtu/ft2 attributable to heating is higher than the national average. This indicates that there are significant opportunities for energy efficiency gains that can lower the annual heating costs for the facility.



The assessment identified the following improvements for the facility:

- **Window Replacement:** The facility currently has the original single pane steel frame windows. The windows allow significant levels of air infiltration and have a minimal insulation value. The assessment proposed to replace the 37 existing windows with Low-E, double pane, insulated windows.

  The modeling conducting by Energy Optimizers indicated that the new windows would have an extremely low ROI. However, if the air infiltration reduction provided by the new windows is taken into consideration, the ROI should increase significantly.

- **Domestic Water Heater:** The existing domestic water heater is nearing the end of its life expectancy. Given that there is not a consistent demand for hot water in the facility, the assessment recommended that the village consider installing a tankless water heater that would provide hot water on demand.

- **Ductless Split System:** The facility currently uses window air conditioning units for cooling and a boiler for heating. The assessment proposed replacing the window units with a high efficiency ductless heat pump system with multiple zones to control the temperature in different parts of the building. The existing boiler would be used for supplemental heating.

- **Lighting:** The facility currently has a large number of fluorescent and incandescent bulbs that require significant amounts of energy. The assessment proposed replacing the existing bulbs with energy efficient LED bulbs that would reduce energy consumption. The assessment also proposed to strategically install lighting controls and occupancy sensors throughout the facility.

<u>Administration Building</u>

The Administration Building located at 92 Cleves Avenue is a 4,000 square foot office building constructed in 1985. The facility uses 36.87 kBtu/ft^2 compared to a national average of 120.1 $kBtu/ft^2$. This discrepancy may be due to its operating hours or the fact that the construction of the building is more efficient than a typical office building.

The assessment identified the following improvements for the facility:

- **Lighting:** The facility currently has a large number of fluorescent and incandescent bulbs that require significant amounts of energy. The assessment proposed replacing the existing bulbs with energy efficient LED bulbs that would reduce energy consumption. The assessment also proposed to strategically install lighting controls and occupancy sensors throughout the facility.

Maintenance Building

The Maintenance Building located at 680 North Miami is a 3,230 square foot facility constructed in 1985. The facility uses 62.1 $kBtu/ft^2$. A national average for facilities of this type was not available.

The assessment identified the following improvements for the facility:

- **Lighting:** The facility currently has a large number of fluorescent and incandescent bulbs that require significant amounts of energy. The assessment proposed replacing the existing bulbs with energy efficient LED bulbs that would reduce energy consumption. The assessment also proposed to strategically install lighting controls and occupancy sensors throughout the facility.

Recommendation

The facility assessment revealed that there are several ways to improve the energy efficiency of buildings owned by the Village of Cleves. One improvement that each of the buildings have in common is the need for energy efficient lighting. The village should consider upgrading the lighting in its facilities to energy efficient LED bulbs, fixtures, and controls. The lighting upgrades will provide significant annual energy savings and pay for themselves in under 5 years.

The village facility that presents the greatest opportunity to improve overall energy efficiency is the police station. The improvements identified during the assessment would result in a significant investment into the facility at a relatively low ROI. However, many of the recommended improvements are essential to the operation of the facility and will need to be replaced at some point in the future. Whether the village decides to undertake a large-scale energy efficiency retrofit or upgrade the equipment on an as needed basis, it should ensure that any future improvements utilize energy efficient equipment.

Energy Conservation Measure	Annual Utility Savings	Annual Maintenance Savings	Project Cost	Utility Rebate Amount	ROI
Lighting	$4,823	$1,456	$36,420	$3,975	19.35%
Window Replacement	$401	$1,200	$93,200		1.72%
Domestic Water Heater	$100	$150	$3,870		6.46%
Ductless Split System	$2,140	$450	$46,200	($480)	5.66%
Project Subtotal	$7,464	$3,256	$201,090	($4,455)	5.33%
Project Total			**$196,635**		**5.45%**

It is also important to note that each of the recommended improvements, with the exception of lighting, have a low ROI industry wide. The village may be able to increase the expected ROI through a competitive bidding process that would enable it to obtain prices lower than those utilized in the energy modeling.

Energy Resiliency

Resiliency is how susceptible a community is to threats, and how capable that community is in overcoming threats when they do occur. In regards to energy infrastructure, there are a number of common, and not so common events that may test the resiliency of the system. First and foremost on this list are weather events that can impact above-ground power and communications networks. Wind and ice events are the most common phenomenon that have the ability to impact utility networks. Underground utilities are also susceptible to disruption by shifting ground or by accidental damage from construction activity.

There are three components to a resilient energy system: prevention, recovery, and survivability[1].

Prevention

This is about preventing damage to the distribution system. Damage can occur in numerous ways. The most common are as the result of weather incidents or traffic accidents. The utility works to minimize the risk of damage through design standards, inspection procedures, and maintenance routines. The utility will periodically trim trees and vegetation in the vicinity of transmission or distribution lines to reduce the risk of damage in a weather event. The distribution network is designed to provide multiple pathways to deliver electricity in the event of damage to a portion of the network.

Recovery

Recovery is about how the community and the utility works together to quickly assess and repair damage to the energy utility network. In the aftermath of a major weather event that causes significant damage to the energy utility network, communication between local emergency responders and the utility companies is essential to identifying and assessing locations where disruption of the network occurred and how to get utility crews to those locations. Coordination is often

[1] Electric Power Research Institute (www.epri.com)

required between local responders and utility crews on dealing with downed trees or accident scenes.

The Hamilton County Emergency Management Agency (EMA) maintains an emergency response plan, and provides information to local governments to prepare their own emergency response plans. Regarding energy, the county emergency response plan designates the local community responsible for assessing local conditions, areas affected by shortages or outages, communication and coordination with utilities regarding outages and facilities of high priority, communication with residents and businesses providing energy information and recommending actions to conserve energy. Cleves coordinates with the Hamilton County EMA and is equipped to perform the necessary functions in the event of a significant energy outage.

Survivability

The survivability component refers to a community's ability to continue to provide essential functions and service through an energy shortage or outage. Essential functions typically include communications, public order and safety, potable water, and essential power to certain health care facilities. The role of ensuring these core functions typically fall to local governments and institutions.

Cleves maintains a backup generator at their water treatment plant. In the event of a power outage, the generator will power the pumps and all essential water treatment functions to ensure adequate water pressure and the delivery of safe drinking water to the village.

A new aspect to the survivability function is allowing for distributed generation (privately owned solar panels and wind turbines). These facilities can be of use in a power outage situation, but also can pose a risk to utility crews working to repair the electric grid. In an outage situation, distributed solar panels or wind turbines could push power out onto the electric grid, which would endanger workers working to repair the grid. It is very important that

Goals and Objectives

The following goals and objectives were drafted by the plan steering committee after reviewing the information included in the preceding chapters. A draft version of these goals were presented for public review at an open-house style meeting on February 8, 2018 at the Charles T. Young School Building and displayed on the Community Energy Plan website at energy.oki.org.

Feedback was also solicited via a web survey, which received 41 responses. The results of the survey is shown in the Appendix of this document. The open-house meeting was promoted via the energy.oki.org website, a display banner at the senior center, and via the Village Facebook page. Also, the meeting was promoted via boosted social media posts, reaching over 2,100 Facebook users in the Cleves area. Eight residents attended the open-house meeting.

1. The Village will look to make sound investments in infrastructure and energy efficiency of Village facilities to save taxpayers money.
    a. Continue to work with Duke Energy to upgrade streetlights to energy efficient LED lights

2. Promote energy efficiency programs that align with the needs of residents and businesses, and that promotes investment in the Village's building stock.

3. Find ways to incorporate more trees in the downtown area to help reduce heat islands.
    a. Update the zoning code to require shade trees in or around new parking lots
    b. Incorporate street trees in any future plans for sidewalk / streetscape improvements along Miami Ave.

4. Continue to coordinate with the County Emergency Management Agency and Duke Energy regarding response to future emergencies, including widespread utility outages.

Appendix