SEDAC
SMART ENERGY DESIGN ASSISTANCE CENTER

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Facility Energy Assessment Report

Smart Energy Design Assistance Center (SEDAC)

Putnam County Junior High School

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Facility Location:	13183 N 350th Ave, McNabb, IL 61335
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Acknowledgements

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Executive Summary

The Putnam County Junior High School is owned by the Putnam County School District and located in McNabb, Illinois. The facility is used as a junior high school for students from grades 6 through 8 and has approximately 46,576 sq. ft. of usable space. The junior high is used by 170 students and 25 staff members and is fully occupied during the school year with minimal occupancy for maintenance activities during the summer months. This building is currently not used as a summer school location.

This report identified 4 potential energy cost reduction measures for implementation. After a thorough evaluation of each measure, 3 of the measures are recommended based upon their feasibility for implementation and strong return on investment.

Recommended Package (package 2) of Energy Efficiency Measures			
Simple payback (before incentives)	3.4 years	**Incentives Available**	$23,100
Annual Utility Cost Savings	$9,200	**Percent Annual Cost Savings Reduction**	19%
kWh Reduced/yr	47,500	**Percentage kWh Reduction**	15%
therms Reduced/yr	4,800	**Percentage therms Reduction**	25%

The recommendations in this report are designed to allow the facility to create an effective and financially prudent implementation plan to be used to help the building become more energy efficient. The report should be used as a tool to facilitate budgetary planning and obtaining funding/financing. Eligible public-sector incentives are described in this report as well as other opportunities for need-based grants and other funding sources. All information is current at the time of the assessment; for up-to-date information on funding or incentives, contact SEDAC any time at 800.214.7954. Alternatively, you may contact your utility. Implementing the recommendations in this report will reduce energy consumption, help improve occupant comfort and, reduce vulnerability to fluctuations in future energy costs. This report can also help towards obtaining LEED® and ENERGY STAR building certification.

Each of the 4 measures is discussed in detail in this report. Recommendations on HVAC, lighting, and plug loads improvements are included along with suggestions for additional cost reduction measures. Table E1 presents the facility's utility information, as obtained from Ameren Illinois documentation. Table E2 presents the results of the analysis performed on each Measure.

Table E1: Utility Information for October 2021 through September 2022

Fuel	Utility	Rate Class	Annual Consumption		Annual Cost ($/yr)	Annual Cost (%)	Unit Cost*	
Electricity	Ameren IL	DS-2	308,646	kWh	$30,576	64%	$0.10	$/kWh
Natural Gas	Ameren IL	GDS-2	19,254	therm	$17,497	36%	$0.91	$/therm
Floor Area	46,576 sf	Totals	2,978,500	kBtu	$48,073	100%		
Site Energy Use Intensity			64	kBtu/sf/yr	Energy Cost Intensity		$1.03	$/sf/yr
Electricity Use Intensity			7	kWh/sf/yr	Natural Gas Use Intensity		0.41	therms/sf/yr
***Note: Unit Costs are blended averages which include all taxes and demand charges.**								

Table E2: Energy Cost Reduction Measure Analysis

Measure #	Description	Potential Energy Savings				Estimated Project Cost	Potential Incentive	SPB w/o &w/ Incentive (yrs)[2]	IRR (%)	NPV ($)
		kW	kWh	Therm	$					
1	Remove Vending Machines	0	4,000	0	$400	$0	$0	0	N.A.	$3,200
								0	N.A.	$3,200
2	Implement Demand Controlled Ventilation	0	9,800	5,100	$5,700	$14,000	$9,300	2.5	39%	$29,500
								0.8	>100%	$38,900
3	Lighting Upgrades	20	33,700	(300)	$3,100	$16,800	$13,800	5.4	13%	$7,100
								1	>100%	$20,900
4	Heat Pump Water Heaters	0	(13,500)	2,400	$800	$11,000	$0	13	(5%)	($4,500)
								13	(5%)	($4,500)
PKG 1	All Measures	20	34,000	7,200	$10,000	$41,800	$23,100	4.2	20%	$35,300
								1.9	52%	$58,400
PKG 2	Recommended Measures (1-3)	20	47,500	4,800	$9,200	$30,900	$23,100	3.4	27%	$39,800
								0.9	>100%	$62,900

Notes:
1) "SPB" Refers to Simple Payback, or the amount of time that the projected energy savings will exceed the first cost of the project.
2) IRR (%) refers to Internal Rate of Return.
3) NPV ($) refers to Net Present Value.
4) Total values have been rounded from calculated values.

1 Introduction

The Public-Sector Design Assistance Program is an energy efficiency program that provides millions of dollars in rebates to public facilities that make large-scale equipment improvements to their electric and natural gas systems. SEDAC supports the Public-Sector Design Assistance Program in advocating the efficient and effective use of energy by businesses and public buildings throughout Illinois. The objective of SEDAC is to encourage communities, building owners and operators, design professionals, and building contractors to incorporate energy efficiency practices and renewable energy systems. SEDAC is managed by the University of Illinois at Urbana-Champaign.

The Smart Energy Design Assistance Center (SEDAC) has performed an energy savings and cost analysis for various energy cost reduction measures applied to the Putnam County Junior High School, located in McNabb, Illinois. The analysis is based on a site inspection conducted on November 1st, 2022, engineering calculations, and typical industry assumptions. This report presents the results of the analysis along with the methods and assumptions used.

Engaging in energy-efficiency strategies to control costs is more critical than ever as organizations face the lingering recession and budget challenges. Organizations that take a systematic and strategic approach toward energy management will acquire a broad array of tangible and intangible benefits of interest to themselves and the public at large.

The elevation of energy management to critical importance is a result of many factors, including an increasingly complex and volatile energy marketplace, a growing awareness about the realities of climate change, recognition of the rising importance of intangibles in calculating market value, and an expanding awareness of the importance to restrict the carbon footprint of organizations. According to the U.S Green Building Council, most commercial buildings use 10 to 30 percent more energy than necessary and have ample opportunities to reduce their energy consumption levels.

Public entities known for aggressive and proactive environmental policies stand to reap many intangible benefits including improved community relations, an enhanced reputation as a socially responsible entity, and improved productivity/morale. Energy management practices also help to ensure the reliability of equipment, which reduce the risks and costs associated with equipment failures and downtime.

2 Building Description

2.1 General

The analysis of the building was based on engineering calculations, rule of thumb assumptions, and experience of the engineer. The sections which follow describe details of the building and important input parameters of the calculations.

2.2 Site Conditions and Building Details

The junior high school operates for students grades 6-8 and has approximately 46,576 sq. ft. of usable space. The facility is used by 170 students and 25 staff members and is fully occupied during the school year with minimal occupancy for maintenance activities during the summer months. This building is currently not used as a summer school location. The original classroom wing, cafeteria, and gymnasium were built in 1963 with an additional classroom wing, front offices, and central communal library space added on in 1976.

2.3 Building Envelope

Roof:

The building has a white rubber (TPO) roof membrane, over a low-slope roof, which is approximately 8 years old. The roof membrane was noted to still be under warranty during our visit. Insulation values likely vary across the roofs from different additions. It is assumed the maximum R-value for the roof is R-10.

There is one arched, frosted, skylight on the roof of the 1976 addition that was previously used for a small greenhouse adjacent to the science room. This greenhouse is no longer used as a growing space.

Exterior Walls:

The building exterior walls are primarily CMU walls with exterior brick veneer. Some wall sections have a combination of brick veneer, cementitious siding, and/or metal siding. The walls are assumed to be uninsulated except for some portions of walls in the 1963 section that had windows removed and replaced with wood-framed, insulated walls. These are assumed to be insulated with R-13 batts.

Windows and Doors:

Windows and doors vary throughout the building due to the series of additions and renovations over time.

The original 1963 classrooms used to have exterior single-paned glass walls. These have been removed and replaced with framed walls and smaller vinyl-clad, wood framed, double pane windows. A similar new wall and windows were also installed in the communal library space. The 1963 gymnasium and cafeteria both contain narrow strip windows that appeared to be site-built, single-pane units. The 1976 classroom wing contains similar narrow strip, site-built, single-pane units. The office area, also built in 1976, contains one single-pane aluminum framed curtain wall assembly.

The main entry doors lead into the 1976 addition and are part of a roughly 20 foot long single-pane, aluminum framed curtain wall. This assembly includes two sets of exterior doors with bottom sweeps and weather stripping installed. One set of these aluminum doors included a central post with weatherstripping. There are two additional sets of single-pane, aluminum-framed doors leading out of corridors. There are also a number of single and double metal doors acting as emergency exits throughout the building, including in each classroom. The gymnasium has 2 sets of metal double doors with solid panels in place of original glazed panels and center posts installed. All the metal doors are assumed to be uninsulated.

Observed doors appeared to be in decent operating condition with some weatherstripping installed.

2.4 HVAC Systems

Heating:

Heat is provided via hot water to the original 1963 gymnasium, kitchen, cafeteria, and locker rooms by two Lochinvar, condensing, modular boilers. These units were installed in 2021 and have an estimated capacity of 800 MBH per unit. The 1963 classroom wing is heated by twelve residential furnaces and one residential mini-split. Each classroom has a dedicated furnace which feeds sub-slab ducts to perimeter diffusers along the exterior wall. These isolated furnaces are each controlled by a programable thermostat.

Heat for the 1976 addition is provided by five RTUs. The first of these units was manufactured by Lennox in 2004 and has a heating capacity of 240 MBH. The next RTU was manufactured by Bryant in 2015 and has a heating capacity of 115 MBH. The next RTU was manufactured by Mammoth and has two heating stages with capacity ranging from 40 MBH to 400 MBH. A second RTU manufactured by Mammoth has single stage heating with a capacity of 400 MBH. Lastly, there is another RTU manufactured by Lennox whose nameplate was inaccessible.

Cooling:

Cooling is provided to the 1963 classrooms by individual roof-mounted condensers tied into the individual, isolated programmable thermostats in each room. The condensers range in cooling capacity from 1.5 tons to 3.5 tons each.

Cooling is provided to the 1976 addition by the five RTU units. The first Lennox unit has a cooling capacity of 12.5 tons. The Bryant RTU has a cooling capacity of 6 tons. Both Mammoth RTUs have a cooling capacity of 21 tons each.

Ventilation:

Ventilation is provided to the 1976 addition through the five RTUs. The original 1963 classrooms are ventilated via outside air dampers connected to the individual furnaces.

Control System:

The building HVAC systems are controlled by isolated programmable thermostats within the original 1963 spaces and by programmable thermostats within the 1976 spaces. Temperatures and setpoints within the 1976 addition are visible on the school district wide BAS. However, there is no direct control from the BAS.

Kitchen:

The buildings kitchen contains the following equipment:

- A warm serving line
- A commercial 10 burner stove
- (2) double ovens
- (2) commercial double refrigerators
- (2) residential refrigerators

2.5 Lighting and Internal Loads

Indoor Lighting:

Interior lighting in the building includes both fluorescent and LED fixtures. The original 1963 classrooms are lit with 32W T8 fluorescent 2-lamp fixtures. The 1976 classrooms are lit with T8 fluorescent 4-lamp fixtures. There are T8 fluorescent 2-lamp fixtures throughout the kitchen and a few T12 fluorescent 2-lamp fixtures within the electrical and walk-in cooler rooms. A good portion of the exit signs throughout the building have been upgraded to LED but some are still lit by incandescent bulbs. The hallways, gymnasium, stage, and front office have been upgraded to LED fixtures. All interior lighting utilizes manual controls.

Outdoor Lighting:

The building's exterior lighting consists of HID wall pack fixtures. Photocells were observed on a few of these fixtures as well as a stand-alone photocell. It is assumed that some exterior lighting is controlled by photocells while the rest is timer controlled. Some of these lights, on the exterior of the cafeteria, were observed to be on in daylight during our visit. Depending on the specific controls for these fixtures it appears that a timer needs to be reset or a photocell has gone bad.

Internal Loads:

Typical internal loads within the building include:

- Computers
- Monitors
- Printers
- Personal space heaters, fans, microwaves, refrigerators
- Other office equipment

2.6 Domestic Hot Water

Domestic hot water is supplied to the original 1963 spaces by a conventional gas fired, 399,999 BTU, 80-gallon capacity unit from Bradford White manufactured in 2006. This unit is coupled with an 80-gallon capacity hot water storage tank manufactured by AO smith. This unit is installed with a recirculation system and all pipes are insulated.

The 1976 addition has a separate 50-gallon electric water heater feeding two restrooms. Observed piping had minimal insulation installed.

3 Energy Consumption Analysis

3.1 Electric and Natural Gas Utility Data Analysis

The building's energy consumption was obtained from utility bills provided by the Putnam County School District. Utility bills were analyzed for a twelve-month time frame from October 2021 to September 2022. The building is supplied with electricity by Ameren Illinois. Natural gas is distributed by Ameren Illinois.

The facility paid a total of $30,576 for electricity in this time frame and $17,497 for natural gas. The total utility cost for the facility from October 2021 to September 2022 was $48,073.

Table 1: Utility Information for October 2021 through September 2022

Fuel	Utility	Rate Class	Annual Consumption		Annual Cost ($/yr)	Annual Cost (%)	Unit Cost*	
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Electricity Use Intensity			7	kWh/sf/yr	Natural Gas Use Intensity		0.41	therms/sf/yr
***Note: Unit Costs are blended averages which include all taxes and demand charges.**								

Figure 1 represents the comparison of electricity consumption (kWh) and annual cooling degree days (CDD). A degree day compares the outdoor temperature to a standard indoor temperature of 65 degrees Fahrenheit. The more extreme the outdoor temperature, the higher the degree day number. Therefore, degree-day measurements can be related to the amount of energy needed for space heating and cooling as compared to the outdoor temperature.

Utility data provided shows a relationship between electrical usage and the school schedule with higher usage while school is in session. The data shows a spike in electrical usage at the beginning of the 2021-22 school year aligning with cooling needs as students return. As the school year proceeds, electrical usage slowly drops towards a baseline as school activity continues, and electric cooling is replaced by gas heating. A similar pattern is noticeable in the data available for the 2020-21 school year.

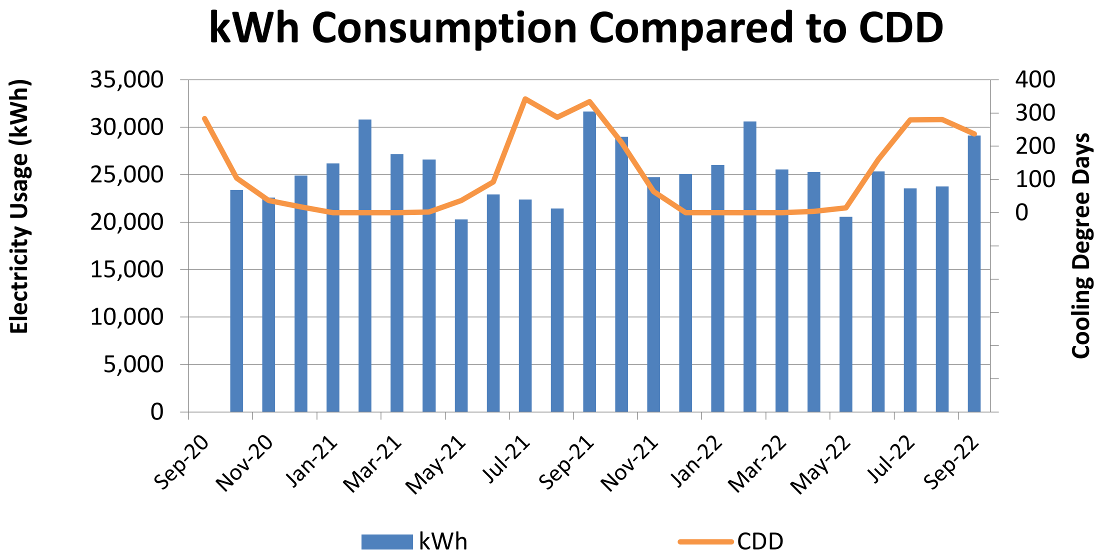


Figure 1: Comparison of Regional Cooling Degree Days versus kWh

Figure 2 represents the comparison of natural gas consumption (therms) and annual heating degree days (HDD). The primary sources of natural gas usage within the building are the gas fired boilers, DHW within the original building, gas fired furnaces for the original 1963 classroom furnaces, and gas fired RTU heaters for the new addition. The data provided shows a strong relationship between heating needs and natural gas usage as well as an overall drop in usage from 2021 to 2022.

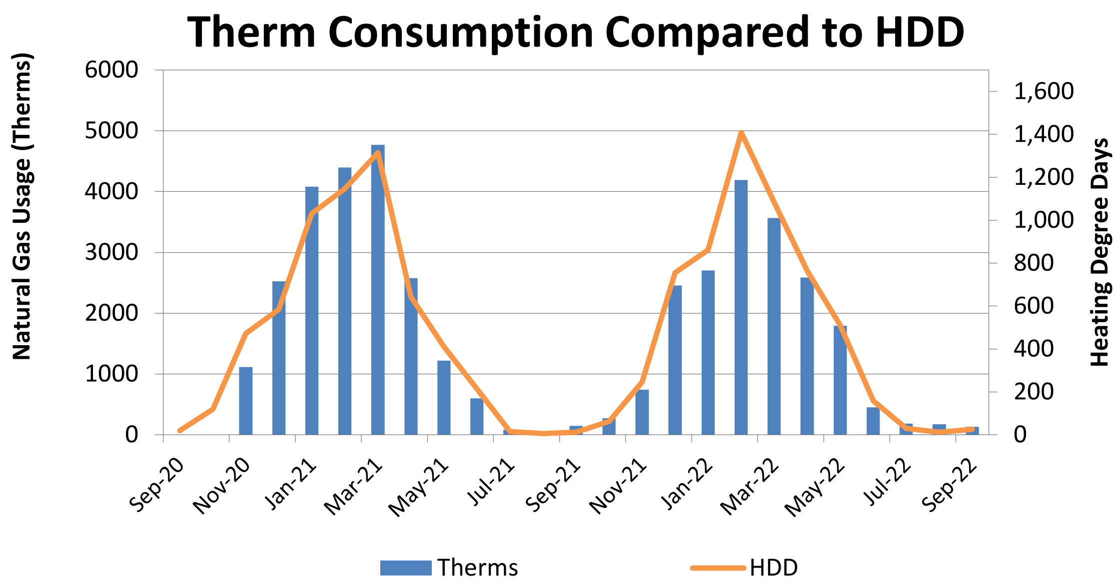


Figure 2: Comparison of Regional Heating Degree Days versus therms

3.2 Benchmarking

Benchmarking is a valuable tool for gauging energy usage relative to similarly classed facilities. Using the ENERGY STAR Portfolio Manager or Target Finder application, the facility's energy consumption can be compared to other facilities of similar size and use. Table 1 below shows the annual site energy consumption of a school building compared to the national average of a similar type of facility, as well as a facility with an ENERGY STAR score of 75, which is the minimum requirement to apply for certification. The results indicate that the Putnam County Junior High School has just above average performance. With a rating of 51, the junior high is not eligible to apply for the ENERGY STAR. Implementation of the recommended measures will help Putnam County School District improve the building's ENERGY STAR score and possibly qualify to become ENERGY STAR certified.

Table 2: ENERGY STAR Target Results

ENERGY STAR Portfolio Manager	Site Energy ($kBtu/ft^2/yr$)	Total Annual Energy Costs ($)	ENERGY STAR Score
Putnam County Junior High School	**64**	**$48,073**	**51**
National Average	64.9	$49,122	50
ENERGY STAR Rated	49.1	$37,148	75

3.3 Breakdown of Energy Consumption

Determining where and in what quantities energy is used throughout the building helps to prioritize energy improvement efforts to maximum effectiveness. SEDAC also estimated how energy is used throughout the junior high school and how much it costs for each function. Figure 3 shows all building energy use, both electric and natural gas, presented in terms of the proportional energy use for each function. Figure 4 shows the energy cost for each of these functions. The proportions are different between the two graphs because the per-unit cost of natural gas is less than the cost of electricity.

Figures 3 and 4 help visualize energy and money flows and give an indication of possible areas for improvement. The building's energy is dominated by building heat, making up 57% of yearly energy. Building cooling, interior and exterior lighting, and domestic water heating combined make up another 35% of yearly energy. The last 8% of 'Other' energy represents plug items such as computers, TVs, printers, personal space heaters, personal fans, and other miscellaneous electrical equipment. Improving the efficiency and operations of these areas can provide abundant savings. Measures address these areas later in this report.

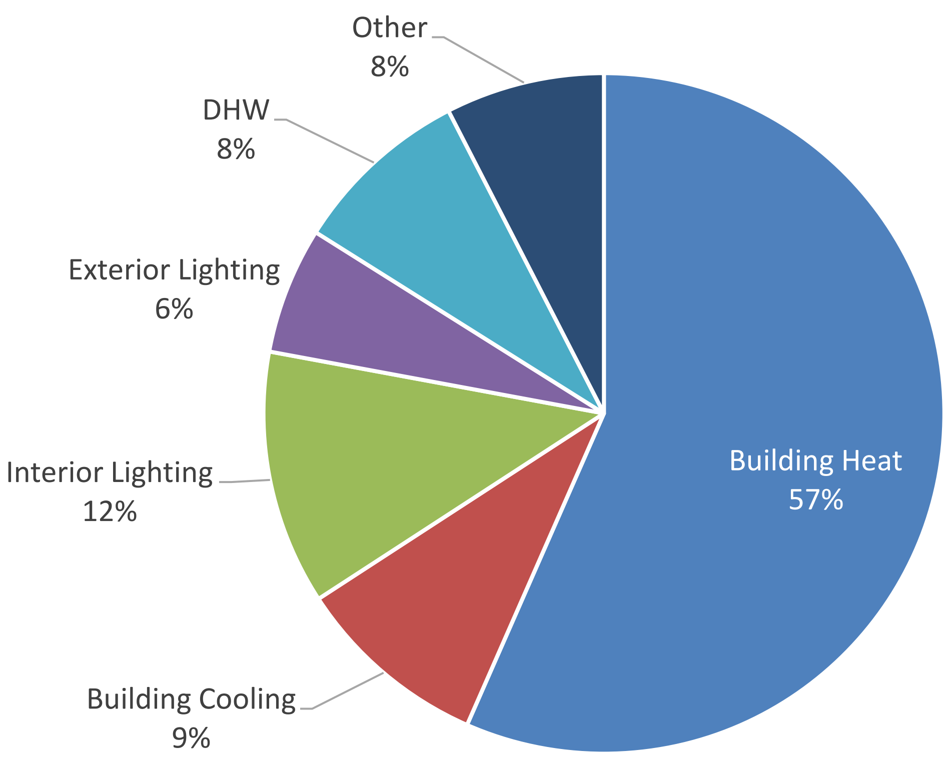


Figure 3: Energy Use Breakdown

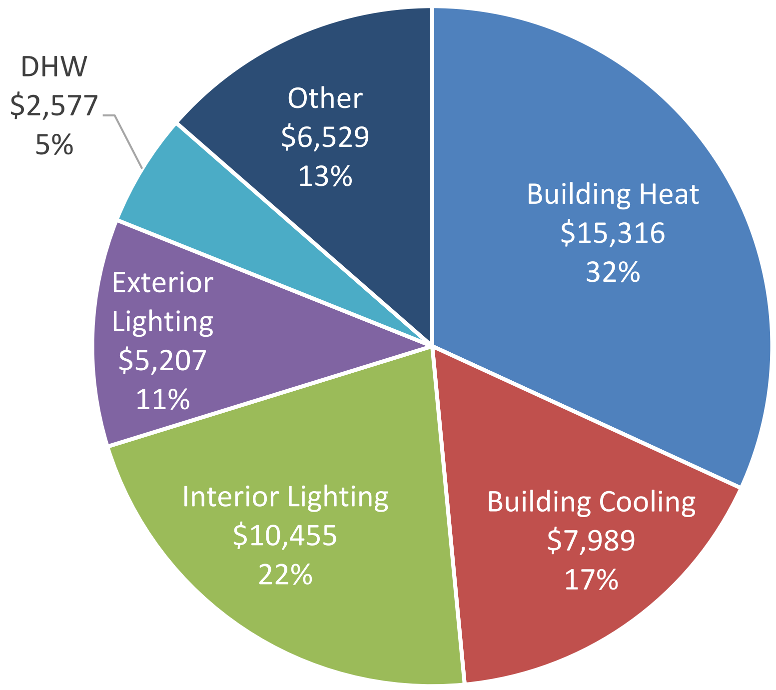


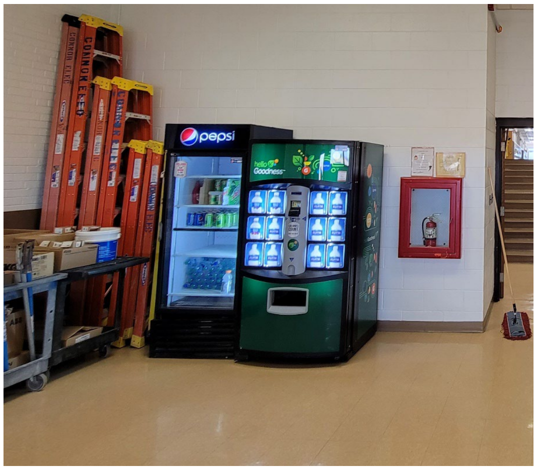
Figure 4: Energy Cost Breakdown

4 Energy Cost Reduction Measures

4.1 Measure–1 Remove Vending Machines

Issues and Observations:

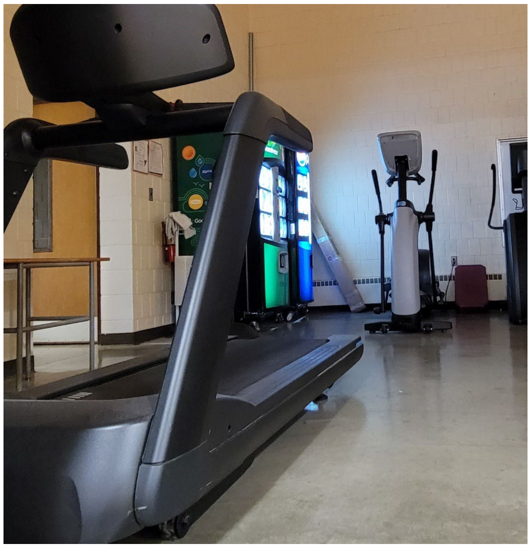
It was observed during our visit that the school building houses a number of vending machines. There are a total of four vending machines throughout the building and conversations on site indicate they are rarely used. There is one vending machine in the cafeteria, one in the teacher's lounge, and two located on the gymnasium stage.



Recommendations:

It is recommended that some or all vending machines be removed in order to save on energy costs associated with their use. Calculations for this measure assume all four vending machines are removed.

Based on the economics, this measure is recommended



4.2 Measure–2 Lighting Upgrades

Issues and Observations:

Interior lighting in the building includes both fluorescent and LED fixtures. The original 1963 classrooms are lit with 32W T8 fluorescent 2-lamp fixtures. The 1976 classrooms are lit with T8 fluorescent 4-lamp fixtures. There are T8 fluorescent 2-lamp fixtures throughout the kitchen and a few T12 fluorescent 2-lamp fixtures in the electrical and walk-in cooler rooms. The hallways, gymnasium, stage, and front office have been upgraded to LED fixtures. All interior lighting utilizes manual controls.

Recommendations:

It is recommended to continue upgrading the building with LED lighting by replacing the remaining fluorescent fixtures or lamps. Calculations for this measure were based on tubular (TLED) replacement lamps which can be used within existing fixtures. It is anticipated that these new lamps would consume 17 watts each as compared to the current lamps of 32 watts each.

Type B TLED lamps offer the lowest cost of ownership when compared to type A LED lamps. While type B lamps will require some rewiring to supply line voltage directly to the sockets, it eliminates the need for a ballast and a future point of failure. It also avoids ballast compatibility issues which can lead to undesirable results.

Selection of new lamps should be coordinated with existing fixture outputs in order to ensure spaces are not over-lit by new LEDs. Ameren's Small Business Direct Installation program provides substantial incentives and may cover the majority of the cost of the project. It also includes the installation labor, which could be beneficial given the district's present maintenance staffing level and summer project needs.

This recommendation includes replacing the incandescent exit signs. As exit signage is lit 24/7, there is an opportunity for savings and reduced maintenance by changing out old bulbs. LED exit signs are expected to use only 5 watts of power and may last up to 10 years.

Based on the economics, this measure is recommended.

4.3 Measure–3 Implement Demand Controlled Ventilation

Issues and Observations:

The HVAC systems presently operate in a constant ventilation mode. This leads to the system operating at its full ventilation output regardless of the actual occupant load. This can lead to spaces overcooling which then requires the building reheat system to compensate. This can also lead to higher energy consumption when the building is not fully occupied, as the HVAC systems have no ability to stage or modulate.

Recommendations:

It is recommended that the existing HVAC system be upgraded in order to implement demand controlled ventilation (DCV). This will provide some staging capability such that the HVAC system can operate at a lower capacity matched to actual occupancy. If and when needed, the system would still have the capability to run at full capacity if the demand exists. Existing CO_2 sensors within spaces may be compatible with new controls and DCV implementation.

One option to implement DCV throughout the entire building would be to replace all thermostats with a wireless-enabled thermostat system. Such a system would be capable of controlling the entire building and would add more visibility and control than the existing systems and BAS currently allow. Some features to consider include:

- Demand control ventilation (CO_2 monitoring) capability
- Ability to set daily schedules
- Remotely monitor and manage thermostat settings
- Ability to prevent or limit adjustability by building occupants
- Fault detection and reporting capability

Based on the economics, this measure is recommended.

4.4 Measure–4 Heat Pump Water Heaters

Issues and Observations:

Domestic hot water is supplied to the original 1963 spaces by a conventional gas fired, 399,999 BTU, 80-gallon capacity unit from Bradford White manufactured in 2006. This unit is coupled with an 80-gallon capacity hot water storage tank manufactured by AO smith. This unit is installed with a recirculation system and all pipes are insulated.

The 1976 addition has a separate 50-gallon electric water heater feeding two restrooms. Observed piping had minimal insulation installed.

Recommendations:

Installing a heat pump water heater would reduce the electricity consumed to provide domestic hot water. Instead of using electricity to heat water, it uses around ¼ of the electricity to move heat from the surroundings into the water. This has some side effects, including providing some cooling to the surrounding space and some nominal dehumidification, which can be beneficial in some spaces. Given the relatively low water use of the facility, it would be wise to install a heat pump water heater when the time comes to replace the existing water heaters. Additionally, the water heater can be downsized when replaced.

Based on the economics, this measure is not recommended at this time.

4.5 Potential Measures Not Quantified

Occupancy Sensors

Installing occupancy sensors in spaces with intermittent occupancy would reduce electrical energy used for lighting. Spaces such as corridors, restrooms, the cafeteria, the gymnasium, and the common library space could all be good candidates for lighting controls such as occupancy sensors. When installed, these devices allow the lights to be turned on only when occupants are present and for a period of time (typically 20 minutes or less) following unoccupancy. Ultrasonic or combination (passive infrared and ultrasonic) sensors are best where the sensor may not have direct line of sight of occupants, such as in bathrooms with partitions.

High Performance Water Fixtures

Based on observed fixtures, it is assumed that the facility uses typical water fixtures, particularly in lavatory faucets. These use 1.2 gallons per minute. New high-performance fixtures can use 0.5 gallons per minute and are as simple to upgrade as changing the aerator. Users typically perceive needle point spray aerators, such as shown below, as higher performance even with the low flow.

Move Walk-In Condenser away from Walk-In Cooler

The air-cooled condenser for the cafeteria walk-in cooler is located directly adjacent to the cooler itself. If possible, it would be best to move this condenser to a new location. Condensers should be located in a space with adequate ventilation, roughly 200 cfm for low temperature units. It is also best to locate condensers where they are easily serviced. The visible damage to the cooling coil demonstrates this condenser is located in a troublesome location. Moving this unit may not only make necessary repairs easier but will also increase the efficiency of the cooler.

Verify Programming of Programmable Thermostats

It was noted during our visit that portions of the building HVAC system are controlled via individual programmable thermostats. The primary spaces controlled in this way are the original 1963 classrooms. It is recommended to verify that these thermostats are operational and set to the same schedules that accurately reflect building operation and occupancy.

5 Incentives

Listed below are various additional opportunities to consider. Please note that the incentive information provided is current at the time the assessment is completed. For up-to-date information on available incentives, contact SEDAC any time at 800.214.7954. Alternatively, you may contact your utility.

5.1.1 Utility Incentive Offerings

The Ameren Illinois Rebate Program offers rebates for energy efficiency improvements that save electricity. Categories of rebates include lighting, HVAC, water heating, specialty equipment, water-saving devices, variable frequency drives, new construction, retro-commissioning, compressed air leak survey & repair, and custom projects. More information and applications can be found here: https://amerenillinoissavings.com/business/find-incentives-on-energy-efficient-equipment/

Lighting upgrade rebate programs include the Instant Incentive Program and the Small Business Direct Install (SBDI) Program. Instant incentives are available through Ameren's online store with quantity limits or through authorized distributors without quantity limits. The SBDI Program is available through registered trade allies and avoids the paperwork of standard and custom incentives. SBDI services include a lighting assessment and project quote, including installation. The SBDI program has higher incentive levels than standard incentives; the incentives may cover up to 100% of the material and labor costs.

Instant Incentives: https://amerenillinoissavings.com/instant-incentives/.

Small Business Direct Install: https://amerenillinoissavings.com/business/industry-solutions/small-business/.

Table 3: 2023 Ameren Incentives

Ameren Offerings	Information
Linear T-8 LED 4' Tube	$10/lamp (SBDI)
Linear T-12 LED 4' Tube	$9/lamp (SBDI)
LED Fixture Replacing T-8 lamps	$0.70/watt reduced (SBDI) $0.50/watt reduced (Standard)
LED Exit sign replacing incandescent sign	$23/sign (SBDI)
Demand Controlled Ventilation	$0.20/square foot controlled
Custom	$0.24/kWh saved $2.00/therm saved

5.1.2 Contractors and Installers

Visit the Ameren Illinois Energy Efficiency Program Allies website for a list of mechanical and lighting contractors, engineers, architects, energy service companies, wholesalers, distributors, and retailers that can help get your energy efficiency project implemented.
https://amerenillinoissavings.com/business/business-contractors/

6 Conclusion

This report by the Smart Energy Design Assistance Center evaluated 4 Measures for potential application by the Putnam County Junior High School to reduce electrical and natural gas consumption and thereby save on utility costs. After thorough evaluation, 3 of the measures are recommended for implementation based on their effective rates of return.

The facility management and operators should be commended for their ongoing efforts to reduce energy consumption. As noted in Section 3 – Energy Consumption Analysis, the junior high school site energy use of 64 kBtu/ft2 is just below the Energy Star U.S. National Median Reference Value. Implementation of the recommended package of measures would yield an ENERGY STAR score of roughly 74. This would bring the junior high very close to qualifying for ENERGY STAR certification. By also participating in a Smart Energy Design Assistance Center Program energy audit, the facility is exhibiting a sharpened focus as an organization dedicated to energy management practices. Undergoing an energy audit analysis sends a very strong message to one's community of a solid commitment to energy efficiency and sustainable business practices.

SEDAC recommends that the energy savings initiatives identified in this report be implemented to decrease the building's overall energy consumption. A total reduction of 47,500 kWh and 4,800 therms is possible through the implementation of the suggested measures shown in Tables E2. This represents an approximate 19% utility cost savings and 15% energy savings. SEDAC recommends implementing this Measure package, which includes:

- Measure-1: Remove Vending Machines
- Measure-2: Lighting Upgrades
- Measure-3: Implement Demand Controlled Ventilation

The suggested measures will significantly reduce the electrical and natural gas consumption of the facility while providing an estimated annual total gas and electric utility savings of $9,200 (at current costs).

The items included in this report are the primary elements of creating and managing a sustainable building; they are to serve as guides to implementation.

We ask that you keep us apprised of all work towards implementation of our recommendations; this information will allow us to accurately reflect subsequent savings. We may also contact you periodically to discuss, answer questions, and review status.

Thank you for the opportunity to be of service. Please do not hesitate to contact us if we may be of further assistance.

7 Customer Interest Form

Below is a selection form that will allow SEDAC to gauge the interest of the client in implementing each individual measure. Please fill this out and return to SEDAC.

Measure ##	Measure Description	Interest in Implementing?		Estimated Completion Date
		YES	NO	
1	Remove Vending Machines			
2	Lighting Upgrades			
3	Implement Demand Controlled Ventilation			
4	Heat Pump Water Heaters			