

# Energy Savings Prize

Paducah Public Schools  
Paducah, KY 42001

*Discover how strategic enhancements at Paducah Independent Schools have transformed educational spaces and enriched student experiences. This presentation will explore the effective upgrades and the vision driving sustained excellence.*

<https://www.paducah.kyschools.us>





# Our Mission

At PPS, we strive to inspire all students to achieve excellence, explore opportunities, and realize their full potential with the goal of preparing each student to be college or career ready upon graduation.

# Our Vision

“Know Every Student by Name and Need”

- Empowering every student through tailored educational strategies.
- Building strong, individual connections within our school community.
- Enhancing learning through focused, personal attention.



# Our Kids, Our Community: Fun Facts and Demographics

Paducah spans approximately 249 square miles containing 11,922 households of supremely talented families. For detailed demographics, visit [Demographics | City of Paducah \(paducahky.gov\)](https://www.paducahky.gov/demographics)


56 State Championships All Sports. Paducah Tilghman is the only school in the state with 800 + wins in varsity football & 2,000+ plus wins in boys varsity basketball.

## A Snapshot of Excellence

Captured here is the dynamic energy of our Paducah sports teams, showcasing the skill and spirit that have contributed to so many victories in varsity sports.

Each game not only highlights our athletic prowess but also strengthens our community spirit.



A woman with glasses and a blue shirt is pointing at a wall. A child in a plaid shirt and safety vest is looking at the wall. The background is a blue-tinted image of a classroom or office setting.

The training sessions and coaching provided by coach Maddy Albee proved to be exceptionally beneficial, offering clear guidance and valuable insights. These programs significantly enhanced our team's understanding in key areas, including:

- Energy savings contracts
- HVAC systems and controls
- Air quality improvements
- Electric vehicle charging stations and bus fleet management

The knowledge acquired is crucial for our district leaders as they continue to implement and finance future energy-saving initiatives, ensuring sustainable progress.

# Powering Progress: Training and Coaching

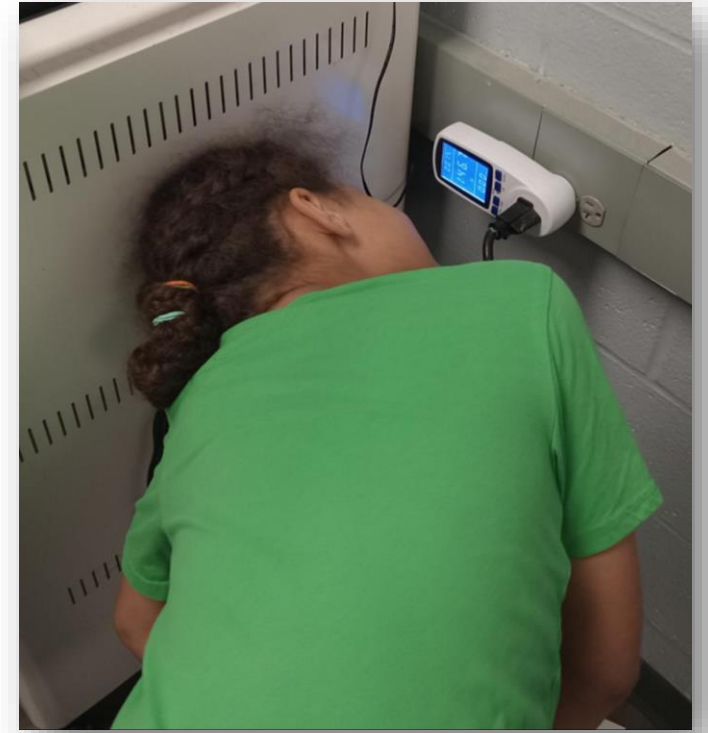
# Progress and Impacts

During Phase 2, significant strides were made in enhancing the school's infrastructure and educational approach to energy conservation



## 43 Air Purification Installations:

Engaging educational activities led by teachers and students to promote energy awareness and conservation.



## ENERGY STAR Treasure Hunts:

Enhanced air quality in essential areas such as classrooms, offices, and libraries.

# Strategic Facility Targeting

Our improvement plan encompasses strategic enhancements at key locations to maximize impact and efficiency.

## Included In Our Plan:

- ✓ Paducah Tilghman High School
- ✓ Paducah Middle School
- ✓ Innovation Hub
- ✓ Clark Elementary
- ✓ Preschool
- ✓ McNabb Elementary
- ✓ Morgan Elementary
- ✓ Central Office
- ✓ Transportation & Maintenance Offices
- ✓ Choices Learning Center



ENERGY CONSERVATION MEASURE	PADUCAH TILGHMAN HIGH SCHOOL	PADUCAH MIDDLE SCHOOL	CLARK ELEMENTARY SCHOOL	MCNABB ELEMENTARY SCHOOL	MORGAN ELEMENTARY SCHOOL	BUS GARAGE	MAINTENANCE BUILDING
1. Thermal Envelope Improvements	✓	✓	✓	✓	✓	✓	✓
2. Water Conservation Measures	✓	—	✓	✓	✓	—	✓
3. Domestic Water Heater Upgrades	—	—	✓	✓	✓	✓	—
4. Kitchen Hood Upgrades	✓	—	✓	✓	✓	N/A	N/A
5. Kitchen Freezer   Cooler Upgrades	✓	—	✓	✓	—	N/A	N/A
6. HVAC Equipment Upgrades	✓	—	✓	—	—	—	✓
7. Heating Equipment Upgrades	—	—	—	—	—	✓	✓
8. HVAC Boiler Upgrades	✓	—	N/A	N/A	N/A	N/A	N/A
9. Heat-Pump Loop Pump Upgrades	✓	—	N/A	N/A	N/A	N/A	N/A
10. DDC Control Platform Upgrades	✓	✓	✓	✓	✓	✓	✓
11. Refrigerant Line Set Insulation Replacement	—	—	✓	✓	✓	—	—
12. Exhaust and Ventilation Control Optimization	✓	—	✓	✓	✓	—	—
13. Interior and Exterior Lighting Upgrades	✓	✓	✓	✓	✓	✓	✓
14. Vending Machine Upgrades	✓	✓	✓	✓	✓	N/A	✓
15. Compressed Air Optimization	N/A	N/A	N/A	N/A	N/A	✓	✓
16. Bus Block Heater Control Upgrades	N/A	N/A	N/A	N/A	N/A	✓	N/A
17. Electric Resistance Heating Upgrades	N/A	N/A	✓	✓	N/A	N/A	N/A
18. Water-Source Heat Pump Upgrades	✓	—	N/A	N/A	N/A	N/A	N/A
19. Destratification Fan Deployment	✓	✓	✓	✓	✓	—	—
20. HVAC Rejuvenation	—	—	✓	✓	✓	—	✓

# Elevating Standards: Priority Building Upgrades

Paducah Public Schools has recently upgraded our facilities, setting new standards in efficiency and sustainability. These enhancements reflect our dedication to providing state-of-the-art learning environments for our students.

Most of the energy conservation measures already deployed at each site can be seen in the chart. Some of the most prominent upgrades include HVAC controls and Lighting in the Elementary, Middle and High Schools

## Planned Enhancements: An Inspiring Future

Our plan focuses on significantly reducing energy consumption by 30% by 2028 through targeted infrastructure improvements. These upgrades are contingent on securing necessary funding, anticipated from state funding sources and grants.

### Forest Hills Solar Initiative:

We have preliminary plans for a Solar PV layout at the Forest Hills site, to implement an environmental mitigation project aimed at the removal of a problematic building to create ground for a solar installation estimated at around 450 kW. The outlined Scope of Work (SOW) from our CCBGP grant submission highlights key points:

- Remediation and demolition of the existing Brownfield site (Forest Hills School).
- Replacement with an approximately 300 kW solar PV array, in collaboration with Paducah Power System.
- Aimed at reducing district energy costs and improving the environment.



### Electrifying Transportation:

The first grant will fund rapid charging stations, six electric maintenance vehicles, and a bus fleet of twelve. These will be strategically located near Interstate 24, a high-traffic corridor, to serve commuters and generate revenue. Savings from reduced fuel consumption and maintenance costs are expected. Martin Electric and Marcum Engineering are evaluating the site's suitability for ten rapid charging stations.



### Additional Plan Highlights:

Paducah Public Schools remains committed to a culture of continuous improvement, addressing not only major endeavors but also smaller, yet impactful, upgrades. Among these planned facility improvements are the installation of HVAC controls at Tilghman sports centers, districtwide implementation of air purification systems, and the lighting system upgrades at Tilghman Gymnasium and Tennis Center.



# Overview of Impacts

The proposed facility upgrades at Paducah Public Schools are designed to yield significant benefits across three key areas: cost savings, health improvements, and enhancement of the learning environment:

- \$30,000 – Stipends to 10 staff members for additional energy and air quality duties and trainings.
- \$41,340 - Installed air purification machines in classrooms, front offices, cafes, locker rooms and media centers.
- \$3,000 - Energy savings team meetings and trainings- Students and staff food, t-shirts, back packs, and water bottles.
- The remaining balance of \$25,660 will be allocated for additional air purification machines, led lighting and controls.

**These upgrades are not just about enhancing physical spaces but are also integral to our commitment to each student's well-being and academic success.**

## Cost Savings:

Efficient operations reduce overhead costs, allowing more resources to be redirected towards educational activities and programs.



## Health Improvements:

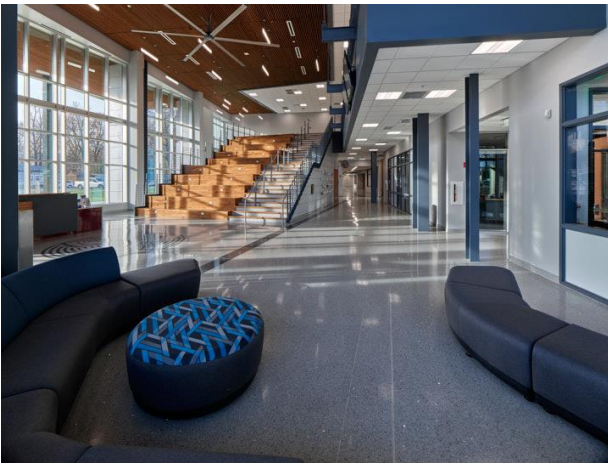
Enhanced air quality and better environmental controls contribute directly to the physical and psychological well-being of both students and staff.



## Learning Enhancement:

By creating more comfortable and conducive learning environments, we facilitate better academic performance and engagement, helping each student explore and realize their full potential.





# Cost Savings and Enhanced Operational Efficiency

The implementation of HVAC and lighting upgrades in our facilities aims to reduce not only our energy consumption but also our operational costs. By integrating modern technologies and systems management strategies, we are setting a standard for sustainability and cost-efficiency in our operations.



- **Energy Savings:** By installing control settings for HVAC systems and lighting with automated controls, we significantly reduce energy usage during both operational and non-operational hours. This proactive approach ensures that energy is used only when necessary, thereby minimizing wastage and optimizing resource use.
- **Operational Costs:** Upgraded systems are easier to manage and maintain. With advanced HVAC and lighting systems, we experience fewer breakdowns and lower repair needs, which translates into reduced maintenance costs. Additionally, efficient systems management leads to prolonged equipment lifespans and fewer capital expenditures in the long run.

# Health Benefits: Air Quality Improvements

Improving the air quality in our schools is key to fostering a healthier, more productive learning environment. By enhancing indoor air quality (IAQ), we see notable improvements in student and staff performance and a reduction in absenteeism.

These efforts align with our commitment to providing a supportive educational setting where every student can succeed.

- **Performance Improvement:**  
Enhanced IAQ has been linked to a 6-9% increase in academic and work performance, reflecting in better test scores and daily productivity.
- **Infection Control:**  
Installing air purification devices cuts the risk of respiratory infections by up to 73%, maintaining a healthier school environment and consistent educational activities.
- **Attendance Benefits:**  
Cleaner air reduces allergens and irritants like mold spores and VOCs, crucial for reducing asthma and allergy symptoms. This leads to higher attendance and better learning outcomes.





These targeted improvements make our school a safer, more comfortable place to learn and work, directly contributing to better educational outcomes and a more secure campus environment.

## Boosting Comfort and Safety in Our Facilities

The recent improvements to HVAC and lighting controls at Paducah Tilghman High School are designed to significantly enhance both the comfort and safety of our facilities. These upgrades focus on precise environmental regulation and advanced safety features to create an optimal atmosphere for both learning and physical activities.



## Boosting Comfort and Safety in Our Facilities

More specifically, the HVAC and lighting improvements at Paducah Tilghman High School are anticipated to benefit the district in four distinct ways:

**Increased Indoor Environmental Comfort:** By more closely regulating the space temperature and lighting levels to the anticipated functional uses of each space, users will be more comfortable and will demonstrate better athletic performance.

**Lower Operational Costs:** Allowing HVAC systems to go into Unoccupied Mode and lighting to automatically turn off during unoccupied periods will yield significant energy savings.

**Greater Diagnostic Capabilities:** These upgrades give district maintenance personnel the opportunity to see and anticipate systems operations and maintenance issues in a timely manner and more accurately identify the root cause.

**Improved Safety:** By utilizing occupancy sensing, lighting can be automatically enabled when occupants are present.



# Implementation and Engagement: Steps Forward

## Funding Strategy:

- Secure funding through a combination of private donations, local business support, grants, and allocations from the district facilities budget.

## Community and Stakeholder Engagement:

- Focus on educating students, staff, and community members about the importance of air quality and energy conservation.
- Implement educational strategies that students can share with peers and family.

## Resource Sharing and Training:

- Disseminate information through the district's website and social media platforms.
- Offer online training sessions for community members interested in learning more about energy savings and air quality improvements.