MILWAUKEE
PUBLIC SCHOOLS

Inspiring District-Wide Energy Action in Schools

Milwaukee Public Schools

May 2024

Team Description: Location & Demographics

Milwaukee Public Schools (MPS), located in Milwaukee, Wisconsin, is the largest school district in the state and the 47th largest school district in the nation.

Milwaukee Public Schools

- Grades: K through 12
- 65,000 students
- 156 schools
- 9,948 full-time staff
- 12% English learners
- 70 languages spoken
- 20.3% special education
- 76.6% economically disadvantaged

Student Demographics

- 49.9% African American
- 28.1% Hispanic
- 9.3% White
- 8.3% Asian
- 4% Multiple (two or more)
- 0.4% American Indian
- 0.1% Hawaiian/Pacific Islander

MPS Facilities Management

Milwaukee Public Schools Department of Facilities & Maintenance manages approximately **17.3 million square feet** of facilities at **206 sites including:**

142 School Buildings

8 Support Buildings

41 Recreation Sites

Four Stadiums

11 Vacant Buildings
(1,271 acres of real estate)

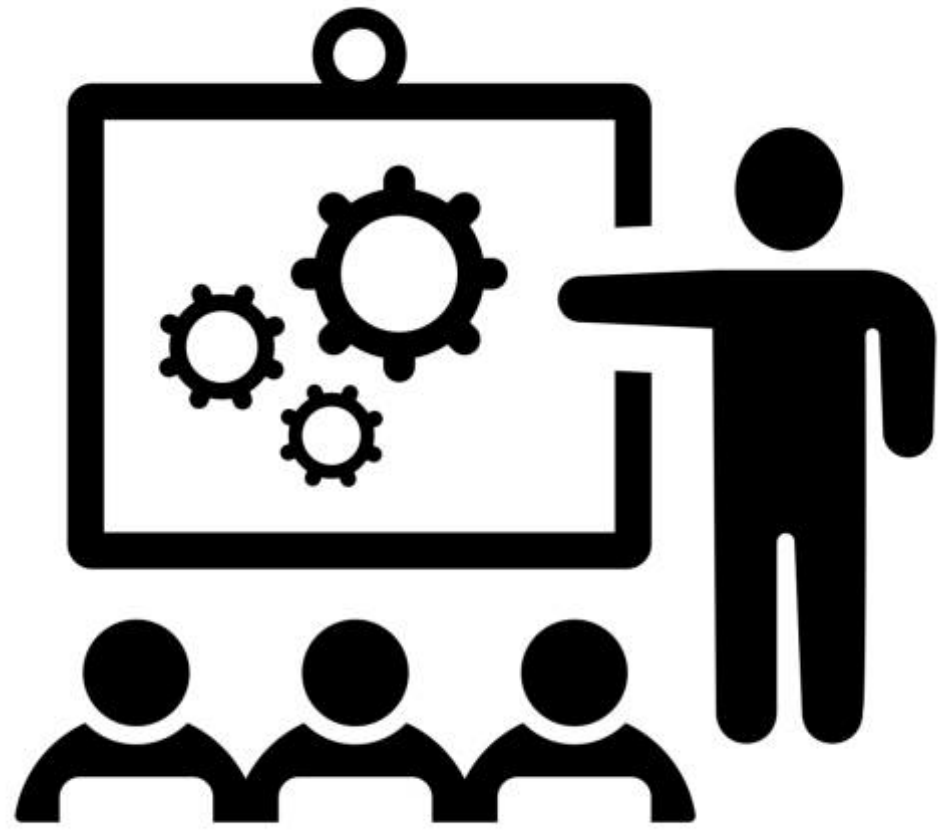
Many MPS buildings have difficulty meeting the district's goal of offering schools that provide 21st-century learning opportunities and the ability to support the needs of diverse learners.

Utilization of Training & Coaching Programs

Multiple departments within MPS utilized the training network and portal to enhance their capacity, gaining a deeper understanding of the significance of this initiative and learning practical strategies for accomplishing it with limited resources.

MPS Training Participants

- ✓ Sustainability Project Specialist
- ✓ Design & Construction
- ✓ Environmental and Safety Team
- ✓ Grant Development and Finance



The Department of Facilities and Maintenance Services (DFMS) also recently added a second Sustainability Project Specialist to the team who will focus on energy conservation and management.

The portal courses are being incorporated into the onboarding program, beginning with Stakeholder Engagement and Resilience Series. The team will continue to utilize the training over the next several years as more individuals become involved.

Progress and Associated Impacts

MPS Department of Facilities and Maintenance Services staff, in collaboration with new partners from Undaunted K12, Citizen Action, Green Homeowners United, and Slipstream, convened to garner consensus about moving the district toward large-scale energy reduction.

The team agreed to reduce energy consumption and diversify on-site energy by tackling items on the deferred maintenance list where alternative energy sources could be used or energy efficiency measures could be implemented.

Progress and Associated Impacts

The MPS Department of Facilities and Maintenance Services has established criteria for systematically selecting facilities for energy conservation and efficiency measures. These criteria will guide the ongoing selection of schools for upgrades.

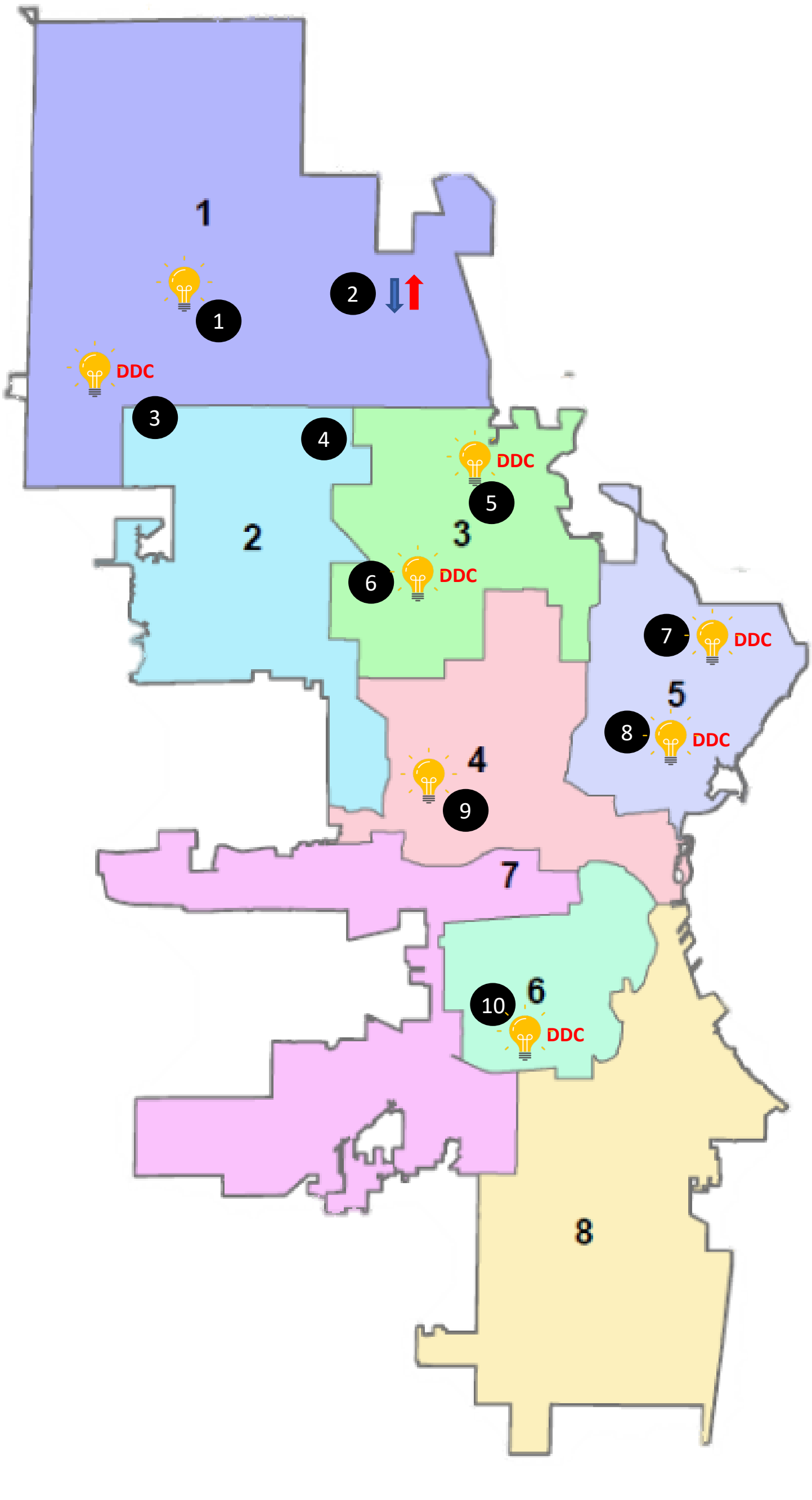
CRITERIA FOR SELECTING FACILITIES

1. **Facilities with deferred maintenance issues**
2. **Facilities lacking improvements over the past decade**
3. **Schools with high energy usage and energy use intensity**
4. **Schools suitable for geothermal heat pumps and rooftop solar installations**

"The Milwaukee Public School District faces approximately $319 million in deferred maintenance."

Summary of Facilities Addressed

The following ten Milwaukee Public School District Schools were selected for Energy Upgrades for Renew America Schools Application



Milwaukee Public Schools District Map Symbols

- District 1
- District 2
- District 3
- District 4
- District 5
- District 6
- District 7
- District 8

Outline = City of Milwaukee

LED Lighting Project

DDC Energy Management System Controls Project

Geothermal Heat Pump Project

1. Morse Middle School for the Gifted and Talented
2. Clara Barton Elementary School
3. Engleburg Elementary School
4. Hampton Avenue Elementary School
5. Samuel Clemens School
6. Dr. Benjamin Carson Academy
7. Cass Street School
8. Golda Meir Upper Campus
9. Milwaukee High of the School Arts
10. Alexander Mitchell Elementary School

Summary of Proposed Building Upgrades

Milwaukee Public Schools Facilities and Maintenance Services identified five project types to be pursued over the next five years that support the reduction in energy use, cost, and improve the learning and working environment across all schools in the district.

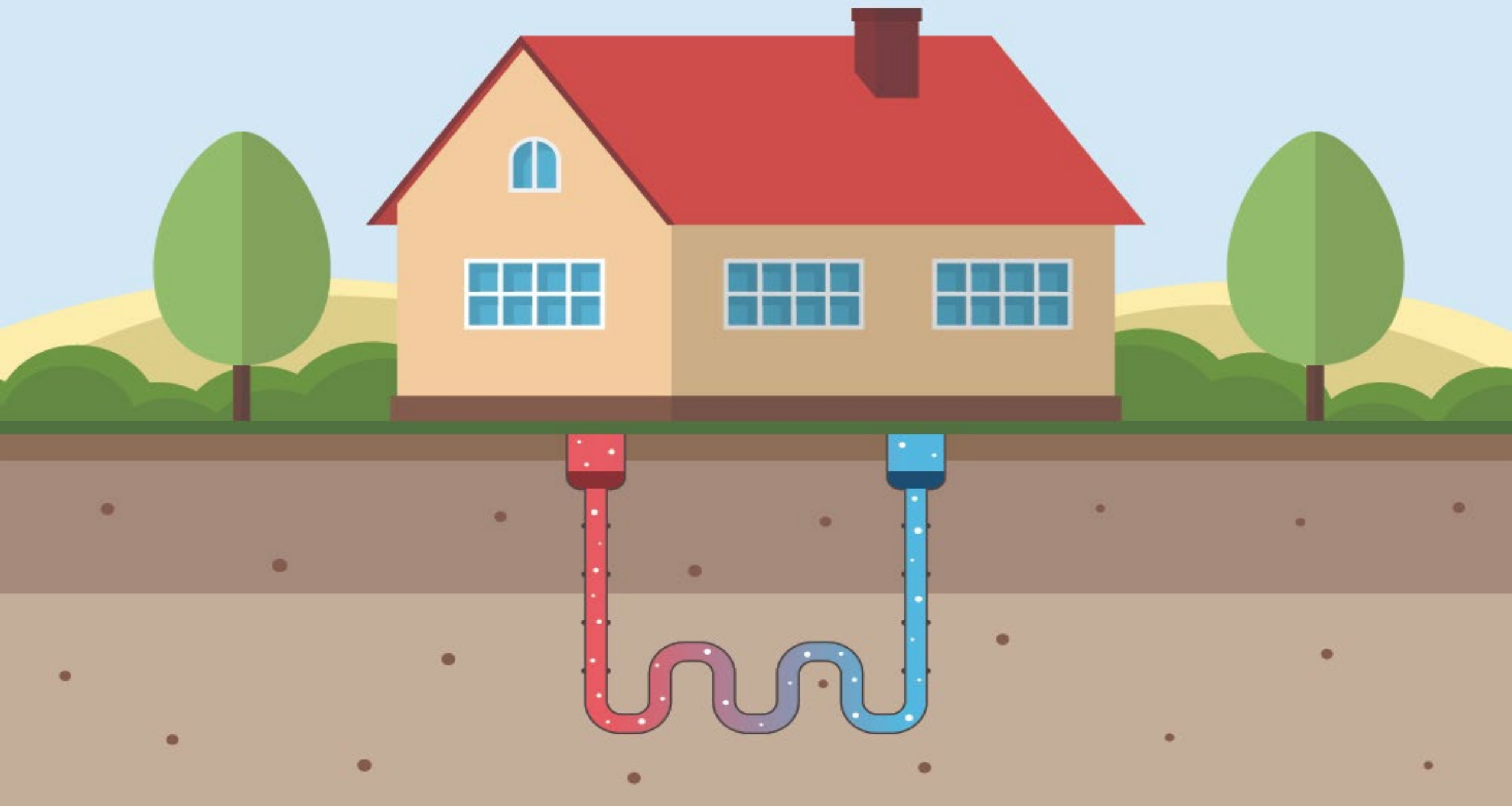
Goal	Metric	Strategy	Action
Write a Sustainability Action Plan inclusive of carbon reduction strategies.	Baseline kWh/yr & therms/yr	Hire a consultant to conduct a baseline ecological footprint study.	Benchmark buildings against each other and peers.
Reduce energy use by 45% (from 2010 baseline) by 2030	Electricity use-kWh/yr	- Repair and upgrade existing DDC energy management systems to optimize energy efficiency -Install new DDC energy management systems in buildings that currently use pneumatic controls	Identify buildings to upgrade (see Table 1.0)
	Therms use-therm/year		
	Electricity use-kWh/yr	-Replace corridor, gym and lunchroom lighting with LED lighting -Pilot LED color-tunable lighting in select classrooms that serve children on the autism spectrum	Identify buildings to replace lighting (See Table 1.0)
	Therms use-therm/year	Install the first geothermal system in one school.	-Identify the school to install the new system (see Table 1.0) -Hire engineering firm to evaluate heat pump types and cost -Work with Finance to determine how to use tax credits

Summary of Impacts

Baseline ecological footprint study and energy benchmarking

In 2022, the Milwaukee School Board of Directors passed Resolution 2223R-007 “Uniting With the City and County to Meet Intergovernmental Panel on Climate Change Climate Justice Targets. This resolution declares that MPS will reduce carbon emissions by 45% (from 2010 levels) by 2030.

Conducting a baseline ecological study of the district with subsequent benchmarking will be essential in prioritizing the next wave of projects to meet that reduction target. Additionally, the City of Milwaukee’s new benchmarking ordinance will enable the public, including teachers and students, the capability to engage with the district’s energy data providing a level of transparency and accountability that does not currently exist.



Ground Source Heat Pumps

MPS has approximately $45 million in deferred maintenance specific to boiler and HVAC systems across the district. Ground source heat pumps have lower operational costs and can provide reliable heating and cooling throughout the year. The district does not utilize heat pumps for heating or cooling purposes. Installing a ground source heat pump at a smaller school such as Clara Barton will serve as a

a means to introduce and train our DFMS team in operating and maintaining these systems. Through this pilot project, we aim to showcase the scalability and financial viability of heat pump technology, evidenced by reduced operational and maintenance expenses.

Lighting Upgrades

Research supporting the benefits of improved lighting in schools is abundant and spans various areas:

Academic Performance

Studies have found a positive correlation between natural light exposure and academic performance. For example, a study published in the journal “Building and Environment” in 2019 found that classrooms with more natural light had higher student test scores in math and reading.

Health and Well-being

Research has shown that exposure to natural light can improve mood, reduce stress, and enhance overall well-being. A study published in the “Journal of Clinical Sleep Medicine” in 2016 found that increased exposure to natural light during the school day was associated with better sleep quality and mood in students.

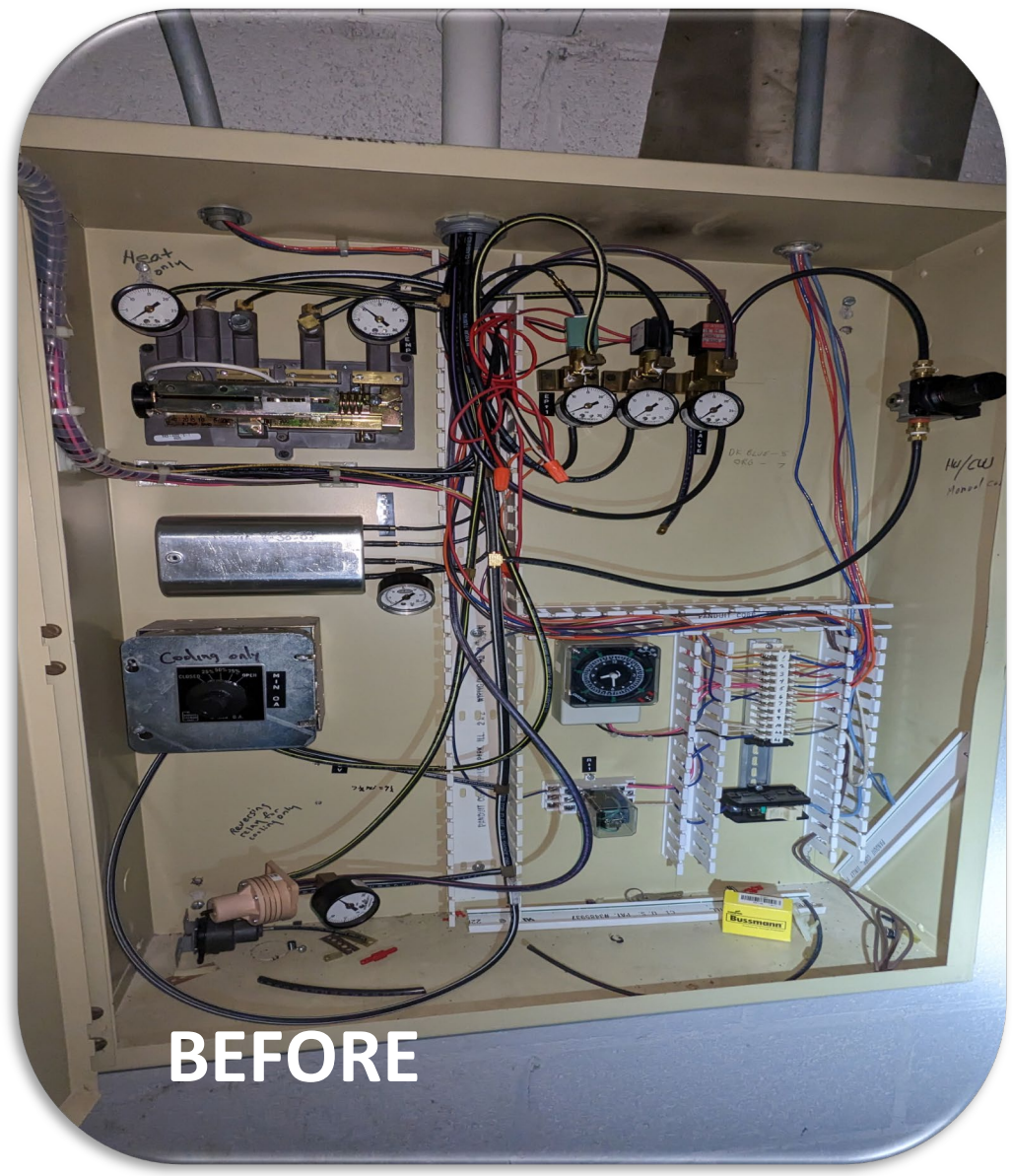
Alertness and Concentration

Proper lighting levels and quality can positively impact students’ alertness, concentration, and cognitive function. A study published in the “Journal of Environmental Psychology” in 2017 found that higher illuminance levels were associated with increased alertness and improved cognitive performance in students.

Energy Management Systems

Upgrading and installing new energy management systems will enable the DFMS team to monitor energy use more efficiently across the district.

Some schools on the deferred maintenance list need upgrades to their current systems while others still use pneumatic systems and will be upgraded to DDC controls.



Both strategies can reduce energy costs and consumption while creating a more comfortable learning environment.

Summary of Next Steps for Implementation

Implementing these projects will require multiple funding streams.

In April of 2024, MPS received a $50,000 Energy Innovation Grant from Wisconsin’s Public Service Commission to conduct a baseline ecological footprint study of the district.

The baseline study will begin in the fall of 2024 and findings will inform the District's sustainability action plan. This plan will include strategies to reduce energy consumption to meet our 45% emissions reduction goal by 2030.

MPS intends to apply for the Renew America Schools grant. If received, matching funding will be sourced from our Green Revolving Funds (2223R-019), DFMS funds, and Focus on Energy (Wisconsin’s statewide energy program) rebates for qualifying projects.

Additionally, we will apply for energy tax credits made available by the IRA to reduce the relative price points for clean energy technologies.