

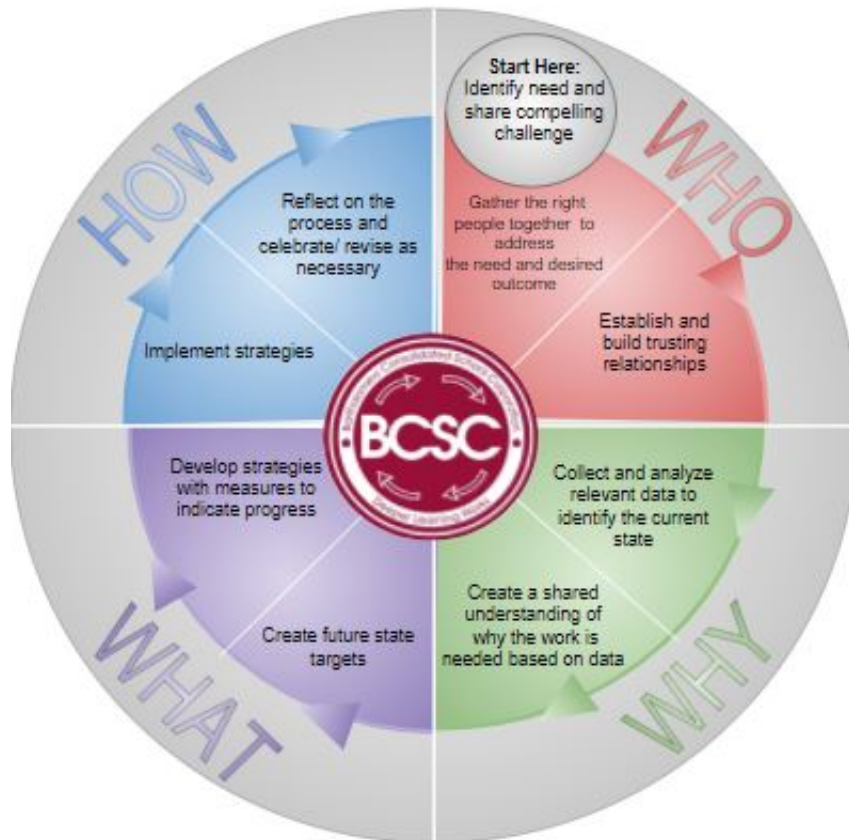
# Energy Sustainability Management Plan 2020



# Message from the Director

BCSC strives to be both fiscally responsible and mindful of its carbon footprint as it strives to be the district of choice in South Central Indiana. BCSC has made great strides in each of these areas since 2005 across its 18 school campuses and 21 total buildings. Each member of the school community plays a role in the district's goals within the Sustainability Management Plan (SMP). The attached document highlights accomplishments and progress towards these goals.

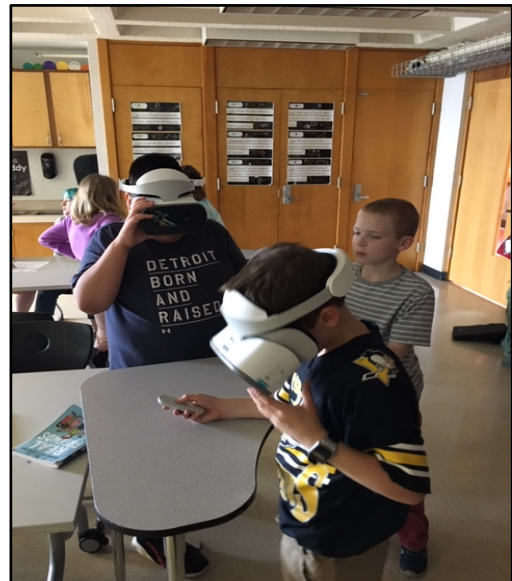
Dr. Brett J. Boezeman  
Director of Operations



# Executive Summary

Bartholomew Consolidated School Corporation (BCSC) continues to make efforts to incorporate sound fiscal decisions regarding energy management. District utility budgets exceed \$2,500,000 annually. Efforts have been made since 2005 to not only reduce cost but reduce the carbon footprint caused by BCSC facilities. On average, BCSC has reduced demand by 2% (\$75,000) each year since the focused efforts began. Below is a synopsis of successes from 2019-2020 and a list of strategies for 2020 and beyond.

- BCSC will join the Metropolitan Energy Gas Association (MEGA) beginning in November of 2021, after the current district contract expires. MEGA is a natural gas purchasing cooperative composing of more than 18 large public school districts. BCSC expects to reduce natural gas cost by approximately 10% annually as a result of this action.
- By 2021, 95% of BCSC facilities will utilize LED lighting. BCSC expects to reduce electricity costs by \$290,000 annually.
- Solar-powered (PV) systems will be added to Northside Middle School and Taylorsville Elementary School in 2020. Savings are expected to be \$161,000 annually.
- Northside Middle School will receive new HVAC controls in 2020, increasing building efficiency. Savings are expected to be \$30,000 annually.
- BCSC continues to implement holiday, weekend, and extended break shutdown procedures, facilitated by all district staff members.
- By 2021, all schools will have water bottle filling stations, reducing the need for disposable containers and encouraging healthy behaviors by students and staff.
- HVAC equipment purchased in 2020 is considered high-efficient and Energy Star © rated.
- Energy usage decreased by 35,824 kWh in 2019.
- Natural gas usage decreased by 12,129 Dtherms in 2019.





## About BCSC

Bartholomew Consolidated School Corporation is the 13th largest school district in the State of Indiana and is home to just over 12,000 students aged 3-21 and more than 1,900 staff members. BCSC serves the majority of Bartholomew County and is located 45 miles south of Indianapolis.

BCSC is a top-performing district, consistently recognized nationally and at the state level for student and staff excellence.

- 96% of educators were rated effective or highly effective by the Indiana Department of Education (Indiana average: 82%).
- 98% of graduates took the ACT.
- 57.2% of students passed ISTEP+ (Indiana average: 53%).
- 85.7% of students received Advanced Placement, Dual Credit, or Industry Certification credits (Indiana average: 54%).

The district owns approximately two million square feet of building space. The 21 facilities include:

- 11 elementary schools
- 2 middle schools
- 3 high schools
- 1 online academy
- Preschool programs at 6 locations
- Magnet programs at 5 locations (Project Based Learning, Spanish Immersion)
- 1 adult education center, 3 administrative centers (BCSC Administration, Information Services Center, Transportation and Maintenance Center)



# Sustainability in BCSC

## *Introduction and Background Information*

BCSC formally developed a Sustainability Management Plan in 2019 as a way to communicate district progress towards energy management goals to the community and other stakeholders. Efforts to reduce energy use and cost date back to 2005 and have been highlighted nationally. BCSC gathered input in the development of the plan from a variety of district stakeholder groups ranging from parents, students, employees, business owners and consultants.

## BCSC Energy Management Vision Statement

Bartholomew Consolidated School Corporation shall demonstrate a commitment to responsible stewardship of resources (natural, physical, material, and financial) while supporting the district's educational and operational needs in a changing world.

### Tenets

The following tenets embody the foundation for the district's sustainability goals and strategies:

1. **Support** the district's educational mission by providing environments that promote student and staff health, productivity, and safety.
2. **Reduce** operational costs through energy and resource efficiency further supporting the district's educational mission and fiscal responsibilities.
3. **Balance** educational, financial, and conservation needs in both daily decision-making and long range planning.
4. **Collaborate** with partner organizations and agencies on best practices that support education in a diverse and changing world.
5. **Measure** and monitor goals and strategies to ensure positive outcomes for the educational and build environment.

## Introduction

Bartholomew Consolidated School Corporation is committed to reducing the use of natural resources by collaborating with the community, governmental agencies, design partners, and businesses to employ common sense reuse, engage in single stream recycling, participate in energy conservation, and implement current technologies in green building and operational efficiencies. This *Sustainability Management Plan* extends the principles of sustainability across all district operations and provides an integrative and collaborative approach toward goals while supporting the district's educational mission and fiscal responsibilities.



Using 2015 as a baseline, reduce district-wide site Energy Use Intensity (EUI) by an average of 2% per year through 2025

### Strategies:

- Lighting and daylighting
  - During design, orient classrooms to maximize daylighting with minimal heat and glare.
  - Implement lighting controls to reduce electric lighting and encourage natural light as the primary source of illumination.
  - Use blinds to reduce impact on daylighting.
  - Develop LED (light-emitting diode) lighting replacement plan for both interior and exterior lighting.
- Building envelope
  - Use insulation with an R-value of R-30 for new roof systems.
- Reduce energy consumption
  - District Energy Manager will turn off loads when buildings are unoccupied.
  - Purchase Energy Star rated equipment and implement guidelines for use to reduce plug loads.
  - Implementation of cloud-based and off site servers.
  - Investigate and implement renewable energy sources such as photovoltaic (PV) systems.
- Student and Staff Participation
  - Train building staff in measures to reduce energy consumption.
  - Create written building occupant guidelines.
  - Conduct nighttime audits to evaluate potential reductions.
  - Improve reporting systems to determine inefficiencies.
- Process Implementation
  - Evaluate establishing recommissioning program for all sites.
  - Use master plan matrix to evaluate best use of funds for facility improvements.

**Energy Use Intensity** is a building's energy use as a function of its size or other characteristics. A lower score equates to a more energy efficient building.

**R-value** is a measure of thermal resistance.



By 2025, BCSC facilities will average an Energy Use Intensity (EUI) score of 50.

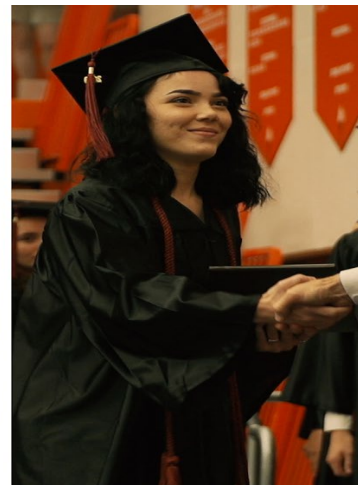
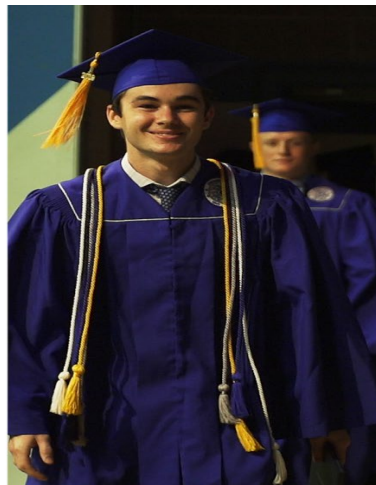
### Strategies:

- Replace, as able, building automation systems (BAS) to improve efficiencies in HVAC controls.
- Replace T8 lighting with LED fixtures across all campuses, both interior and exterior.
- Implement energy management process during low occupancy times.
- Perform commissioning on building envelopes, mechanical systems, and controls.
- Monitor ongoing data of mechanical systems for operational efficiency.
- As building roofing systems are replaced, implement PV solar systems to help move building toward net zero energy usage.
- Review available rebates prior to purchase of replacement equipment, dedicate staff and collaborate with local partners to ensure rebates are obtained.

A **Net Zero energy** building produces as much energy as it consumes annually.

### Recognitions and Benchmarks

- Indiana Department of Education Green Ribbon School – Columbus North High School – 2015
- Energy Star Ratings:
  - Columbus North High School – 2014
  - Columbus East High School – 2014
  - CSA New Tech High School – 2014
  - CSA Lincoln Elementary School – 2014
  - Clifty Creek Elementary School – 2014
  - CSA Fodrea Elementary School – 2015
  - Information Services Center School – 2015
  - Parkside Elementary School – 2016
  - Richards Elementary School – 2016
  - Central Middle School – 2018



## BCSC Facility Current State of EUI

\*2019 data

Location	Electricity Use (kWh)	Fossil Fuel Use (Mbtu)	Square Feet	EUI
North HS	3,935,158	16,312	537,002	55.3
East HS	5,163,953	12,833	502,160	63.4
Northside MS	2,113,479	9,011	170,231	83.6
Central MS	1,718,166	5,342	171,484	70.2
Southside ES	1,060,584	7,051	151,517	78.4
Mt. Healthy ES	788,351	2,645	60,730	64.2
Clifty Creek ES	362,750	2,925	88,177	57.5
Rockcreek ES	756,310	n/a	55,495	55.4
Schmitt ES	670,910	3,587	90,500	66.4
Parkside ES	718,980	2,580	85,934	55.4
Richards ES	613,900	2,571	90,929	53.9
Taylorville ES	634,626	2,090	88,577	48.2
Administration	490,906	1,398	40,000	103.3
CSA Fodrea ES	624,976	2,365	63,018	78.6
Smith ES	508,000	3,235	78,185	59.7
CSA New Tech HS	470,400	1,241	46,189	64.2
CSA Lincoln ES	394,830	813	41,064	56.3
McDowell	276,347	2,050	34,072	83.1
Transportation	172,349	1,313	25,577	81.1
Johnson ELC	172,907	934	21,602	73.3
Info Serv Center	116,699	302	8,998	78.1
Average				68.1

## Historical Energy Use

\*data reflects district-wide use

Year	Electricity (kWh)	Electricity Cost	% Change
2019	22,010,797	\$ 2,180,446	-2%
2018	22,701,931	\$ 2,216,270	1%
2017	23,251,195	\$ 2,257,094	-1%
2016	23,928,000	\$ 2,209,670	-2%
2015	24,736,934	\$ 2,239,505	-1%
2014	24,831,289	\$ 2,481,148	1%
2013	24,560,662	\$ 2,291,295	n/a





## Successes and Accomplishments 2019

BCSC recognizes the importance of being fiscally responsible while lessening its carbon footprint. Funds dedicated to energy efficiency have supported many projects resulting in significant achievements in resource efficiency. Progress toward these goals in 2019 include:

- LED lighting upgrades at every building campus (21)
- Improving insulation at Taylorsville Elementary in roofing system from R-13 to R-23
- Installation of two high-efficient condensing boilers at Administration building
- Installation of new chiller at East High School
- Replacement of 66 double-paned, high efficient windows in Memorial Gym at Columbus North HS
- Recommission HVAC systems at CSA Lincoln and Southside Elementary Schools
- Reduced electric usage across the district by 691,134 kWh in 2019
- Reduced natural gas usage by 12,129 Dtherms in 2019
- Obtained rebates in the amount of \$10,379 for lighting projects

## LED Lighting Upgrade Overview 2019-2020

Cost of LED	Cost of Electricity 2018	Expected Savings (annual)	Expected Savings (10 years)
\$1,700,000	\$2,216,270	\$290,000	\$2,900,000

Utilizing funds from a general obligation bond, BCSC contracted with Energy Systems Group via an open public bid to replace and upgrade nearly every T8 light at East High School, North High School, Northside Middle School, Central Middle School, and Southside Elementary School to high efficiency 10.5 watt LED bulbs. The remainder of BCSC facilities will be upgraded during calendar year 2020. The Return on Investment (ROI) with this project is 5.2 years without factoring in expected rebates from utility providers. The expected life of LED bulbs are also 5 years longer, on average, than existing T8 bulbs. Most importantly, LED lights provide a better lighting environment for teaching and learning in BCSC schools.



# BCSC Current State of LED Lighting

\*expected savings are estimated and do not include acquired rebates

Location	Electricity Cost	Expected Savings (annual)	% of LED project complete (2/1/20)
East HS	\$487,187	\$73,000	
North HS	\$390,359	\$64,000	15%
Northside MS	\$207,702	\$23,000	95%
Central MS	\$172,698	\$22,000	95%
Southside ES	\$106,368	\$26,000	
Mt. Healthy ES	\$90,255	n/a	100%
Clifty Creek ES	\$88,278	n/a	100%
Rockcreek ES	\$96,042	\$5,800	
Schmitt ES	\$68,020	n/a	100%
Parkside ES	\$72,210	\$12,750	
Richards ES	\$63,152	n/a	100%
Taylorville ES	\$65,215	\$13,400	
Admin	\$54,631	\$6,000	
CSA Fodrea ES	\$62,604	\$9,450	
Smith ES	\$51,962	\$11,700	
CSA New Tech HS	\$48,210	\$7,000	
CSA Lincoln ES	\$40,476	\$6,200	
McDowell	\$28,770	n/a	100%
Transportation	\$19,121	\$3,600	
Johnson ELC	\$18,282	\$3,100	
Info Serv Center	\$12,230	\$1,300	
Total	\$2,180,446	\$288,300	





# Solar Roofing Project 2020

In 2020, BCSC will implement the use of solar energy panels at Taylorsville Elementary and Northside Middle School. This project is not only designed to save the district energy costs, it will provide teaching and learning opportunities for more than 1,300 students on environmental science. The solar project is expected to:

- Reduce the amount of kWh purchased at each site by 30%.
- Provide additional protection to the current roofing systems, thus extending the life of each.
- Provide STEM educational opportunities with connections to Indiana Academic Standards
- Have a return on investment (ROI) of 10.2 years or less.
- Bring Taylorsville Elementary very close to a “net zero” building, meaning most of the energy used by the building is produced on site (see graph below).

This project is expected to be completed prior to the start of the 2020-2021 school year.

Site	Annual kWh used	kWh produced by solar	Estimated annual savings
Northside MS	2,113,479	872,098	\$113,655
Taylorsville Elem	634,626	360,100	\$48,222

