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Environmental Sustainability
Spring 2025 Update

Board of Education – May 21, 2025

Bernerd Rice, Assistant Superintendent
Capital Programs and Physical Properties

Jason Bing, Director
Capital Programs

Stephanie Corona, Project Executive
Gilbane Building Company

Kevin Stansbury, Project Design Manager
Gilbane Building Company

Agenda – Environmental Sustainability

- Overview – Why does AAPS care about Environmental Sustainability in New and Major Projects
- What are AAPS goals for Sustainability?
- What is AAPS integrating into our New and Major Projects?
- Where can one find this information?
- What else is coming – Next Steps
- Summary

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Why does AAPS invest in Environmental Sustainability?

Drivers – Environmental Sustainability

ANN ARBOR

Ann Arbor declares climate emergency, sets 2030 carbon-neutral goal

Updated: Feb. 14, 2020, 10:44 p.m. | Published: Nov. 04, 2019, 9:57 p.m.

ANN ARBOR

Washtenaw County leaders OK plan to reach carbon neutrality by 2035. What's next?

VICE PRESIDENT FOR COMMUNICATIONS
MICHIGAN NEWS
UNIVERSITY OF MICHIGAN

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U-M commits to universitywide carbon neutrality

May 20, 2021

Written By:
Adam Fisher

Why Environmental Sustainability?

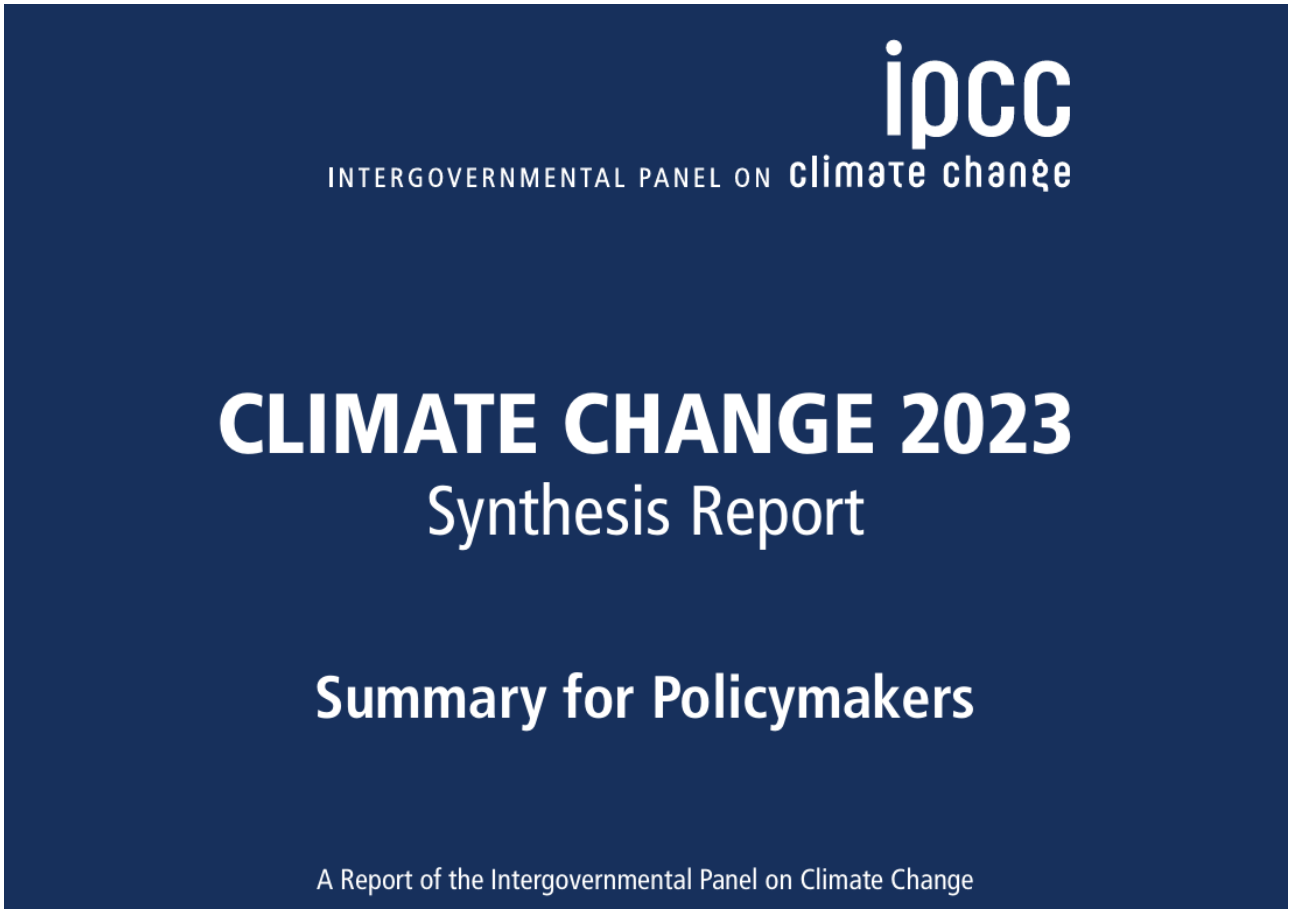
- Investing in our Students and Staff **Now**

  Supporting Health and Wellness through healthy, high performance school buildings

- Investing in our Students' **Future**

  Decarbonizing the AAPS to support reduced carbon, reduced operating costs, and Climate Action

What the Scientists Say

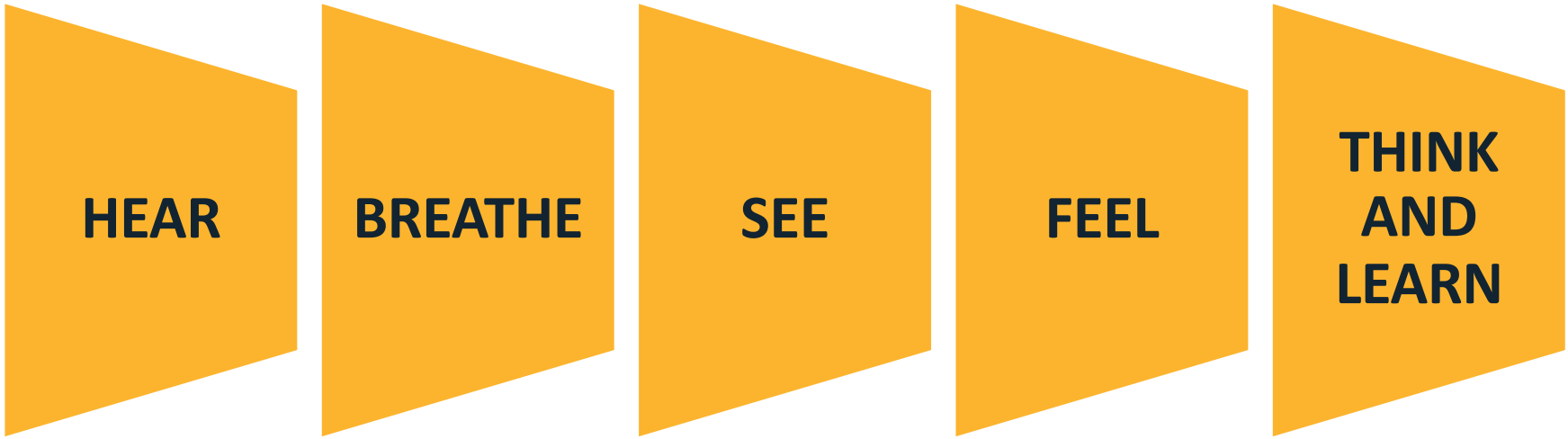


“Schools for Health: Foundations for Success”

www.forhealth.org

‘How School Buildings Influence Student Health, Thinking, and Performance’

Research Overview – How Students:

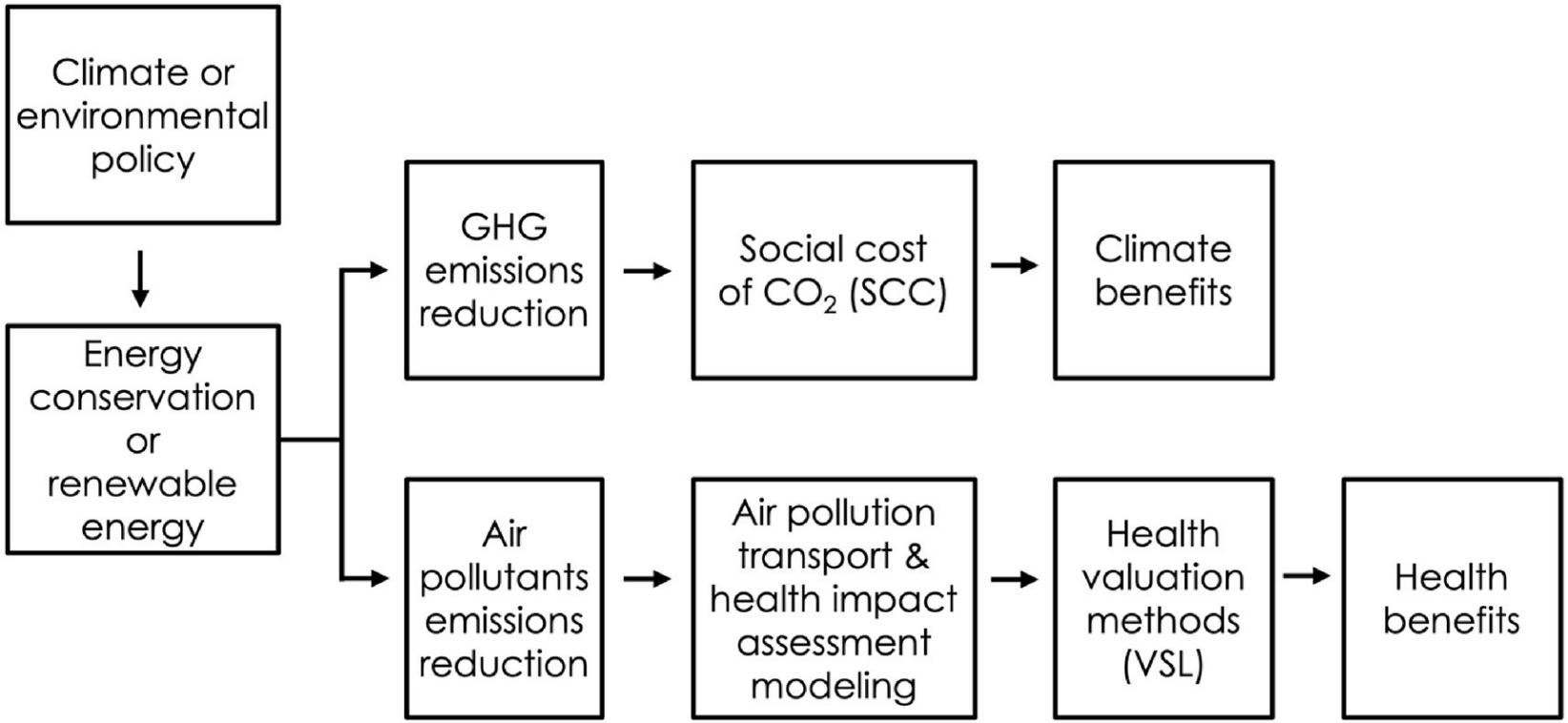


Source: “The Impact of School Buildings on Student Health and Performance: A Call for Research”
http://www.usgbc.org/Docs/Archive/General/Docs18534.pdf

Linking **Academic Performance** with Physical Building Performance *(Decarbonization)*

'Healthy Buildings for Health', Harvard T.H. Chan School of Public Health

Why Environmental Sustainability?



https://www.sciencedirect.com/science/article/pii/S0360132323006455?via%3Dihub

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What did AAPS outline in the 2019 Bond and beyond?

2019 Bond and AAPS Capital Program Vision

Our Kids
Our Schools
Our Future
ANN ARBOR PUBLIC SCHOOLS

To transform the student learning experience with the goal of providing for the health, safety, and well-being **of all students** in high-quality, equitable, and environmentally sustainable schools

AAPS Capital Program Goals

Our Kids
Our Schools
Our Future
ANN ARBOR PUBLIC SCHOOLS

2019 BOND: Renewal & Re-envision

- Prepare schools to adapt to climate change
- Chart a course for carbon neutrality
- Utilize interior and exterior finishes that are long-lasting and require minimal maintenance and replacement
- Install dimmable LED lighting
- Install renewable solar & geothermal energy sources
- Increase recycling and composting

Board Policy 8000: Environmental Sustainability

Approved by the Board on December 12, 2018

The Ann Arbor Public Schools recognizes that:

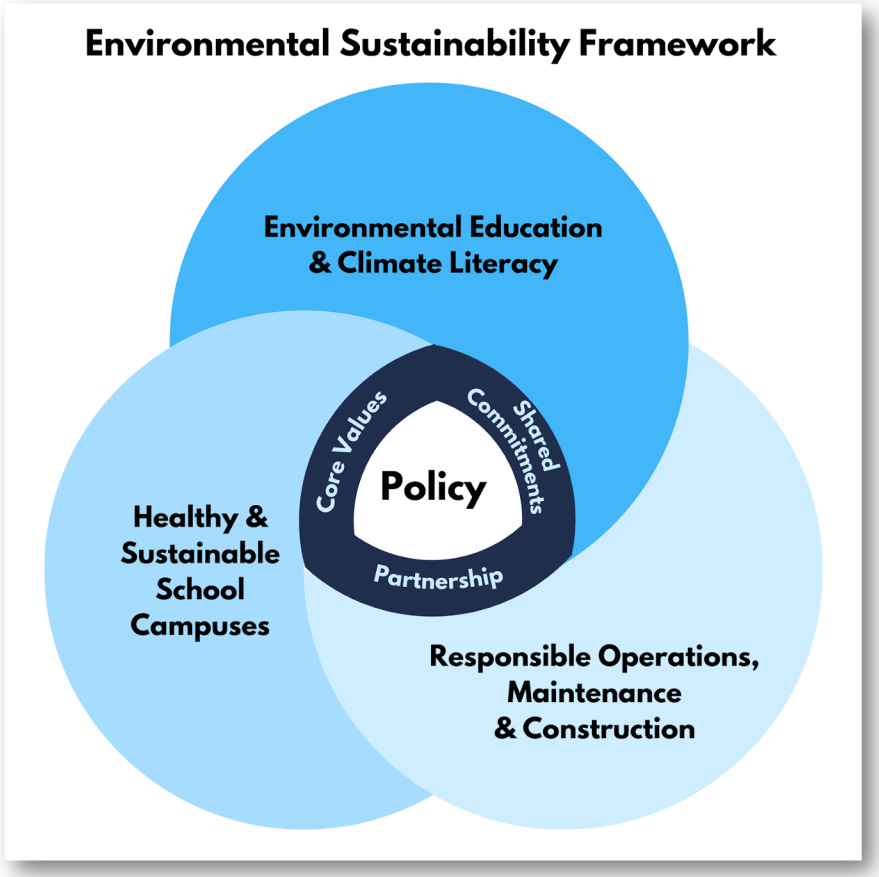
- **Climate change is real, increasing, and caused by human activity**; and
- the Ann Arbor community is committed to practices that support a healthy environment for present and future generations; and
- the District has a responsibility to help prepare current and future generations to respond to climate change through the reduction of harmful human activities, the promotion of human activities that restore the environment, and the development of strategies to adapt to climate change.

The District will support the prioritization of:

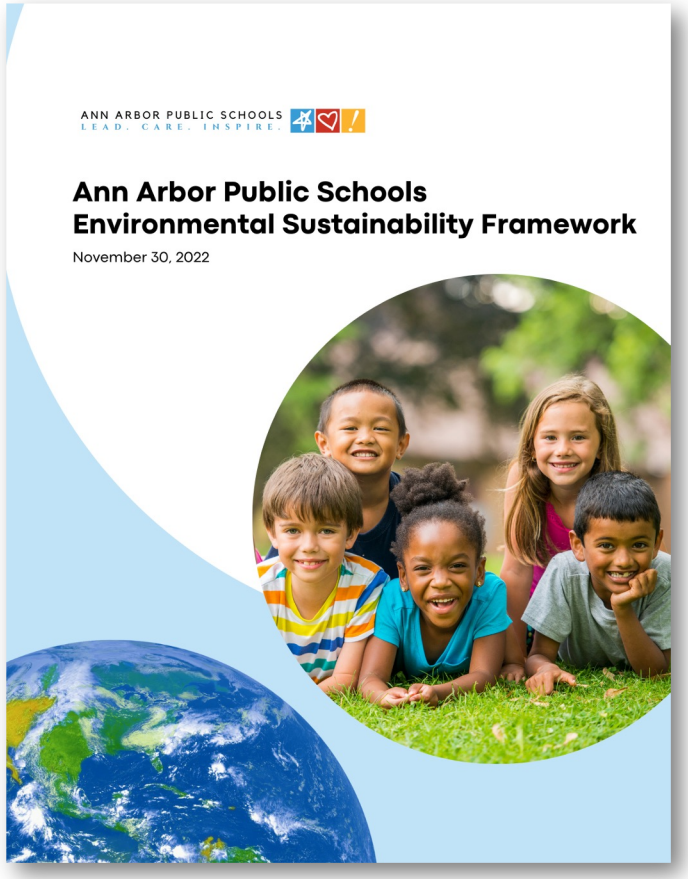
- **Environmental sustainability education** that prepares present and future generations to become thoughtful stewards of the environment; and
- developing **student leaders** prepared to succeed in an uncertain climate change future; and
- maintaining and operating **district buildings and grounds** that reduce the environmental impact of human activities, promote the restoration of the environment, and adapt to climate change; and
- building and enhancing **partnerships** that support the Ann Arbor community's environmental principles.

The Superintendent and/or designee(s) will report annually to the Board of Education on activities related to this policy.

AAPS Environmental Sustainability Framework



Approved by the Board in November 2022



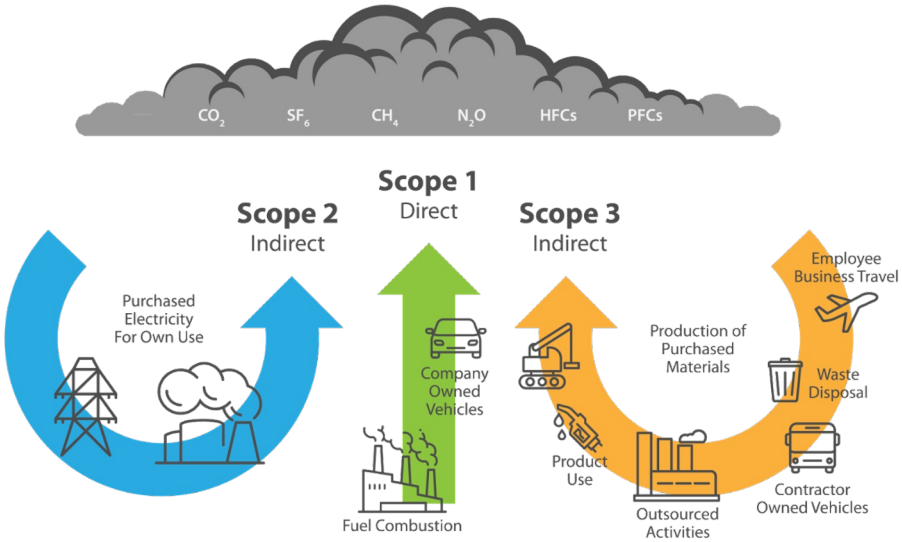
AAPS Environmental Sustainability Framework

Greenhouse Gas Emissions (GHG) - Overview

AAPS accounts for less than 1% of our community's greenhouse gas (GHG) emissions. Though this is a small amount of the total emissions in Washtenaw County, the district is committed to doing what it can to be part of a carbon-neutral future.

AAPS Environmental Sustainability Framework includes important steps to reduce the district's GHG footprint. These actions are organized based on the three scopes of emissions utilized by the Intergovernmental Panel on Climate Change (IPCC) of the United Nations, major corporations, countries, and municipalities worldwide, including in the United States.

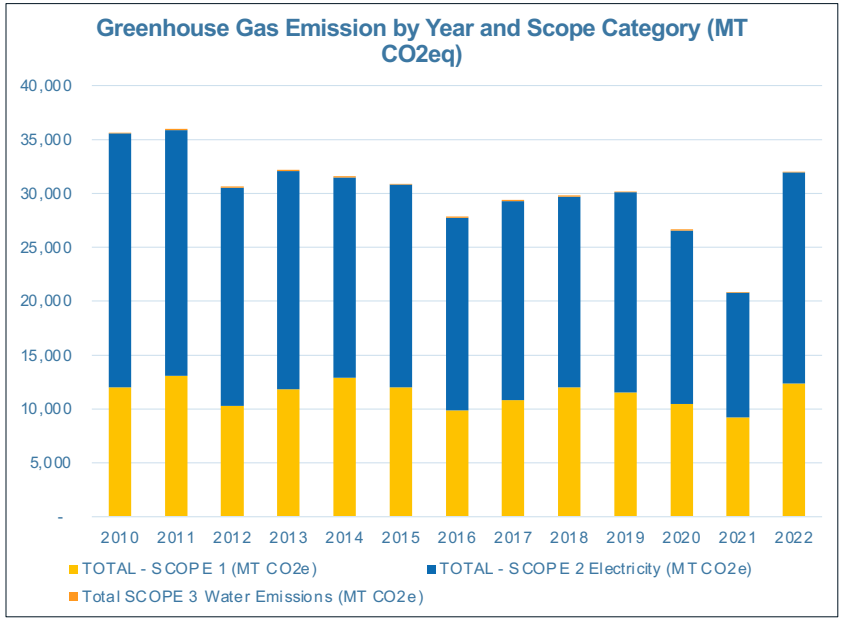
The IPCC defines Scope 1, 2 and 3 emissions as:
'Scope 1' indicates direct greenhouse gas (GHG) emissions that are from sources owned or controlled by the reporting entity. 'Scope 2' indicates indirect GHG emissions associated with the production of electricity, heat, or steam purchased by the reporting entity. 'Scope 3' indicates all other indirect emissions, i.e., emissions associated with the extraction and production of purchased materials, fuels, and services, including transport in vehicles not owned or controlled by the reporting entity, outsourced activities, waste disposal, etc. (WBCSD and WRI, 2004).

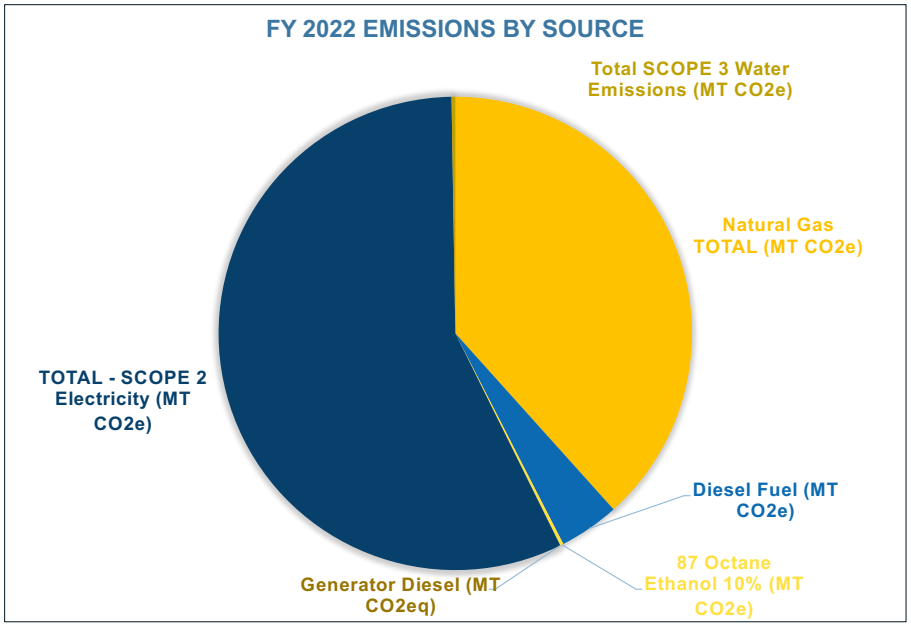


AAPS Environmental Sustainability Framework

Greenhouse Gas Emissions (GHG) - Overview

SCOPE 1+2+3														
Fiscal Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2022 vs. 2010
	Baseline													
TOTAL - SCOPE 1+2+3 (MT CO2e)	35,630	35,961	30,646	32,167	31,579	30,893	27,855	29,378	29,819	30,194	26,650	20,848	32,018	89.86%
Per Student (MT CO2e/student)	2.17	2.17	1.84	1.93	1.92	1.84	1.63	1.68	1.69	1.70	1.50	1.20	1.88	86.53%
Per 1000 SF (MT CO2e/1000 SF)	10.15	10.25	8.73	9.17	8.96	8.77	7.90	8.34	8.42	8.46	7.47	5.84	8.97	88.36%





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How is AAPS integrating Environmental Sustainability?

AAPS Sustainability Targets + Metrics Tracking

US – CHPS Certification

- Meet Collaborative for High Performance Schools - Verified Leader certification

EUI of 25 or lower

- NBI Decarbonization Roadmap and ZeroTool

10% or better embodied carbon reduction

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Tracking Progress through the Collaborative for High Performance Schools (US-CHPS)

Sustainability Rating Systems

Overview - Collaborative for High Performance Schools (CHPS)

CHPS is a leading national green building verification system to improve student performance and the entire educational experience by building the best possible learning environments. To achieve this goal, CHPS maintains the nation's most authoritative criteria for healthy, environmentally sustainable, cost-effective school buildings.

The CHPS Criteria for New Projects is designed to help school districts in every community across the country to:

- **reduce operating costs;**
- **achieve higher student performance;**
- **increase daily attendance;**
- **retain quality teachers and staff;**
- **be energy, water and resource efficient;**
- **and minimize environmental impact.**

Sustainability Rating Systems – Major Projects

Categories - Collaborative for High Performance Schools (CHPS)

Strong focus on student and staff health and wellbeing and energy efficiency and conservation

Point Assignments in the Core Criteria

Category	% (Points)
Integration (II)	11% (22)
Indoor Environmental Quality (EQ)	33% (66)
Energy (EE)	24.5% (49)
Water (WE)	9% (18)
Site (SS)	8.5% (17)
Materials & Waste (MW)	6.5% (13)
Operations (OM)	7.5% (15)
TOTALS	100% (200)

CHPS provides many benefits for AAPS, including:

- *Third Party verification of environmental performance*
- *Creates systems of accountability for design and construction teams*
- *Transparent methods to track and report environmental sustainability performance*

Typical Major Project Protocols

For each of the AAPS' major projects, the following tasks are completed in the early planning phases:

- Environmental Site Assessment Reports
- Threatened and Endangered Species Reviews
- Background Noise Studies
- Traffic Studies
- Topographical Surveys with associated Title Work and, where appropriate, Wetland Delineations
- Thermal Conductivity Testing
- Soil Bearing and Infiltration Testing
- Sustainability Reports/Reviews
  - ➢ Climate Vulnerability Assessment
  - ➢ Energy Modeling
  - ➢ Whole Building Life Cycle Assessment
    - ❖ Environmental Product Declarations (EPD)

Sustainability Reports

Intent: to catalog the process of meeting Sustainability Objectives during design phases, and the results of that process at the completion of the project.

- Sustainability Reports remain open (i.e. incomplete) until the project has been occupied for nearly a year.
- At that point, the final Report is submitted by the Design Team

Mitigation Measures from these Reports are identified and incorporated into the design / scope of work.

US-CHPS – Verified Leader Tracking

Estimated Tracking/Metrics

	Mitchell Elementary	Dicken Elementary	Logan Elementary	Thurston Elementary
250 Total Pts - 64% needed (160)	66-68% total pts	>64% total pts	66-70% total pts	66-70% total pts
Indoor Env Quality Pts	74-84% IEQ pts	>68% IEQ pts	68-78% IEQ pts	68-77% IEQ pts

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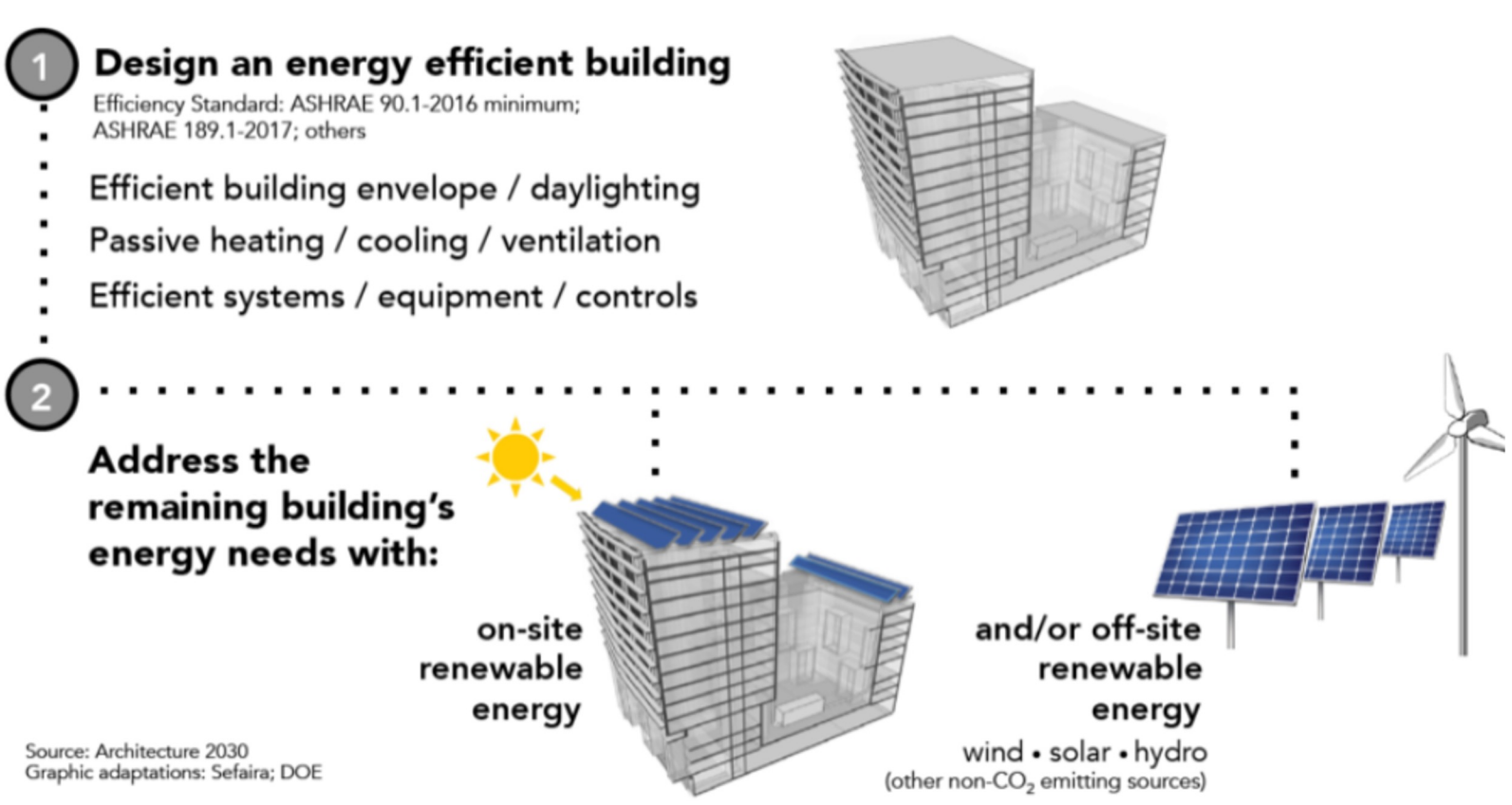
Tracking Progress on Decarbonization Targets

Net Zero Energy (NZE) and Zero Energy Ready (ZER)



Energy Modeling

Energy Efficiency and Emissions

Path to Zero Carbon

Passive design: access to daylight, calibrated external shading system, natural ventilation, high performance envelope.

Active design: efficient air distribution system, displacement ventilation, decouple heating/cooling from ventilation; active controls to shut down during unoccupied periods; all electric heating and cooling with energy recovery.

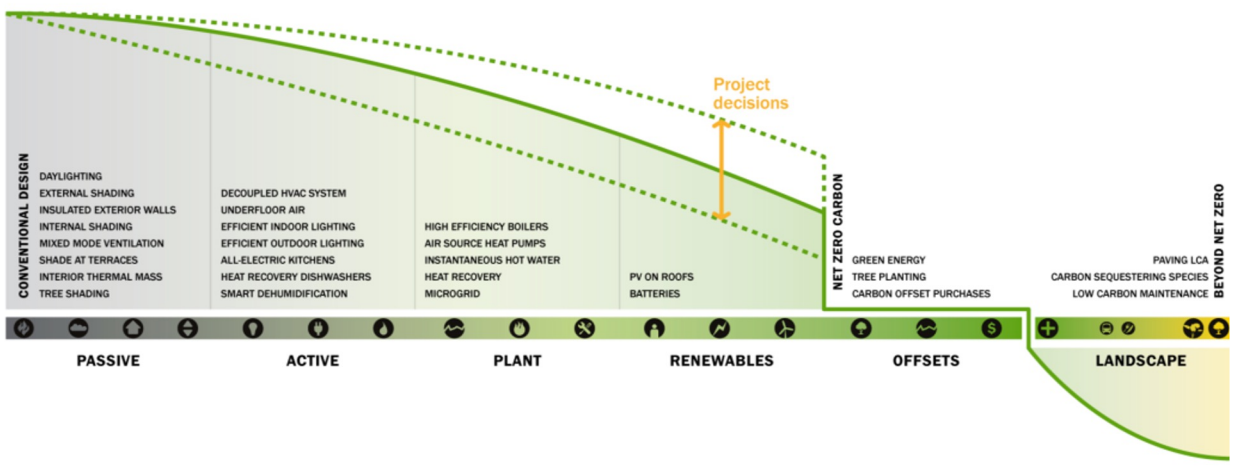
All-electric development: electrification of heating, domestic hot water, and any natural gas use in kitchens.

On-site and off-site renewables

Advanced microgrid controls: tied to on-site photovoltaic array and battery storage to maximize GHG reduction from renewable sources

Building Quality Assurance

atelier ten



What major, early design decisions, will impact the projects' abilities to reduce their holistic carbon footprint and contribute to an all-electric future?

Net Zero Ready in Planning/Practice

Estimated Modeling

	Mitchell Elementary	Dicken Elementary	Logan Elementary	Thurston Elementary
Total Square Feet (SF)	24% larger	32% larger	36% larger	32% larger
Total Energy Use (kBtu/sf/yr)	35% less energy	42% less energy	29% less energy	24% less energy

Whole Building Life Cycle Assessment (WBLCA)

Embodied Carbon

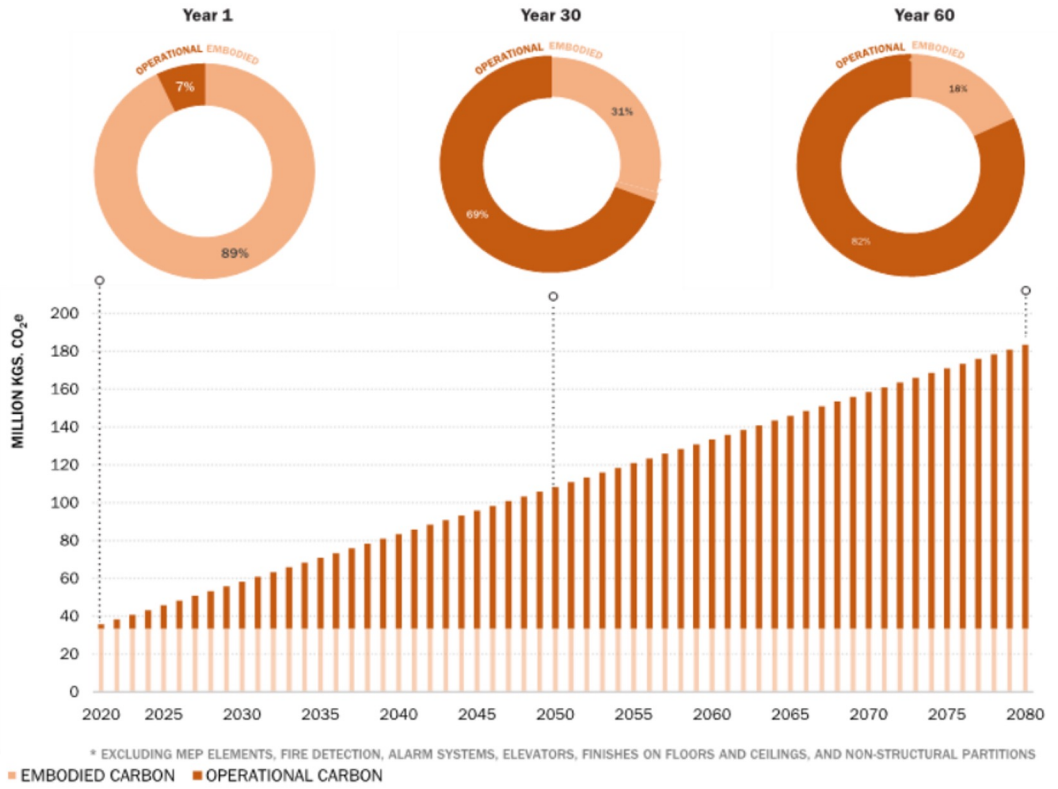
Materials Matter - Time Value of Carbon

Embodied carbon should be a part of the conversation around defining **climate positive design**

Carbon reductions now have more value than carbon reductions in the future as we strive to stay under 1.5°C

By the **year 2050, embodied carbon emissions and operational emissions will be roughly equivalent** (steel construction scenario).

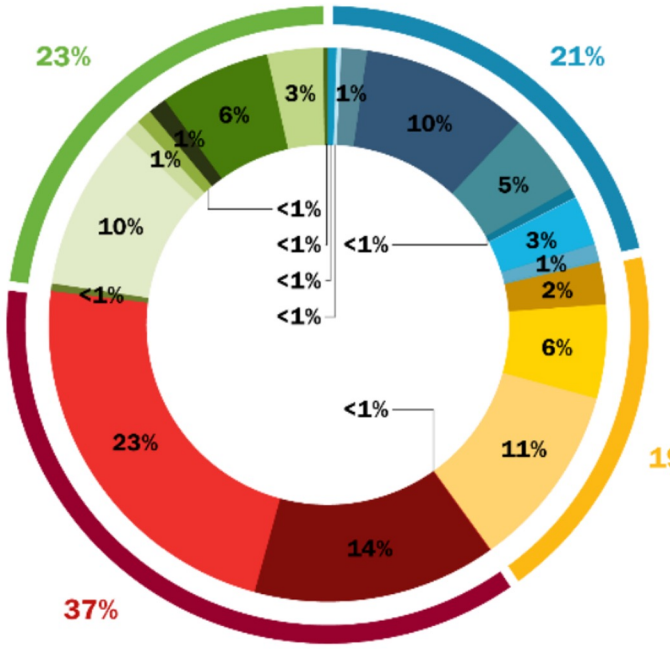
LEED version 4 has a Materials & Resources credit that gives **credit for quantifying and reducing embodied carbon**.



TIME VALUE OF EMBODIED VERSUS OPERATIONAL CARBON

Embodied Carbon

Embodied Carbon Drivers



ENCLOSURE
- Glass
- Gypsum, Plaster, and Cement
- Insulation
- Steel and Metals
- Insulated Metal Panel
- Doors, Windows, and Parts
- Wood
- Plastics, Membranes, and Roofing
- Concrete

SUBSTRUCTURE
- Concrete Rebar
- Geotechnical Pile Concrete
- Concrete

SUPERSTRUCTURE
- Insulation
- Structural Steel
- Concrete

INTERIOR
- Flooring and Wall Base
- Carpet Tile
- Glass
- Gypsum
- Insulation and Acoustic Finishes
- Paints and Coatings
- Steel and Metals
- Doors, Windows, and Paneling

20-30% Enclosure

45-60% Structure

20-30% Interiors

Structural materials drive the majority of a building's embodied carbon footprint. Early design decisions to significantly reduce associated emissions make a large impact.

Enclosure material selection should be closely reviewed alongside building energy use impacts.

Select interior finishes can have high embodied carbon emissions.

Embodied Carbon Reductions

Estimated (Whole Building Life Cycle Analysis)

	Mitchell Elementary	Dicken Elementary	Logan Elementary	Thurston Elementary
Embodied Carbon Total	>10% over baseline	>10% over baseline	13.1% over baseline	14.2% over baseline
Embodied Carbon includes sequestration Total	33% over base with biogenic carbon	>20% over base with biogenic carbon	29% over base with biogenic carbon	27% over base with biogenic carbon

New Mitchell – Main Entry View

New Mitchell – Learning Commons View

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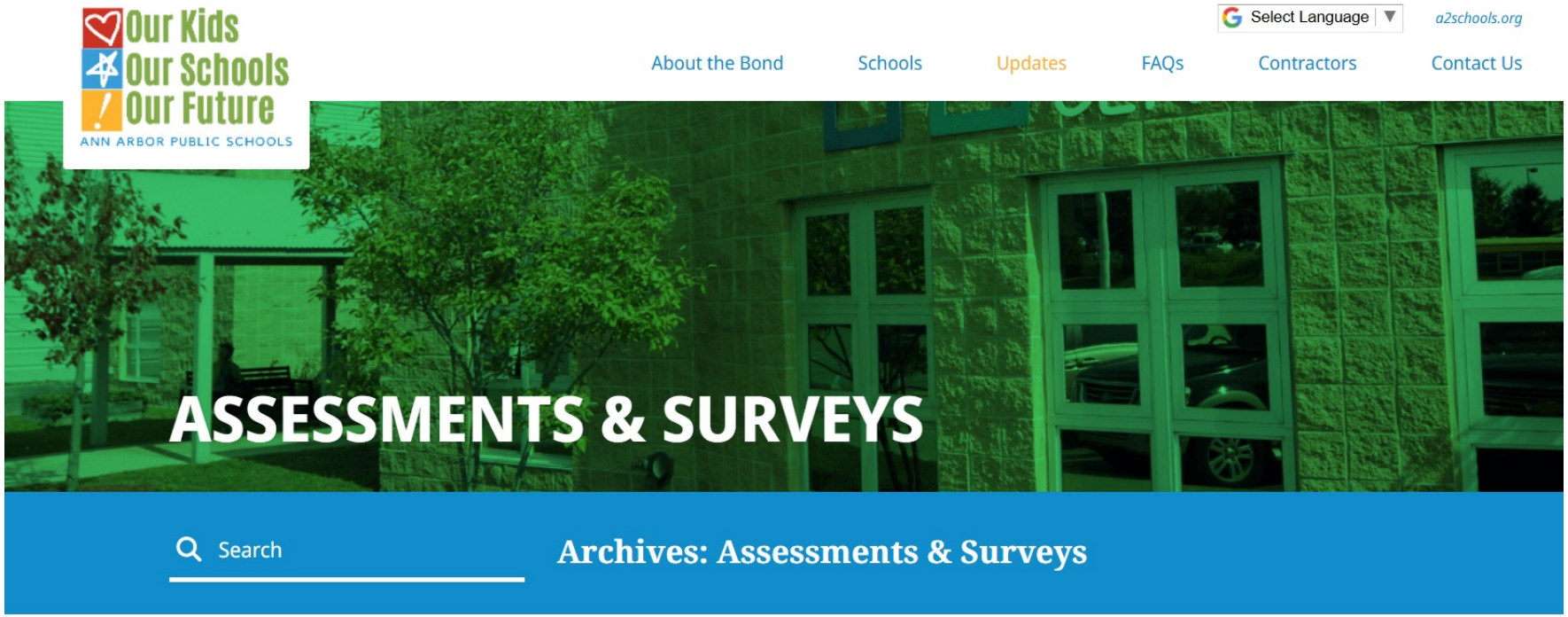
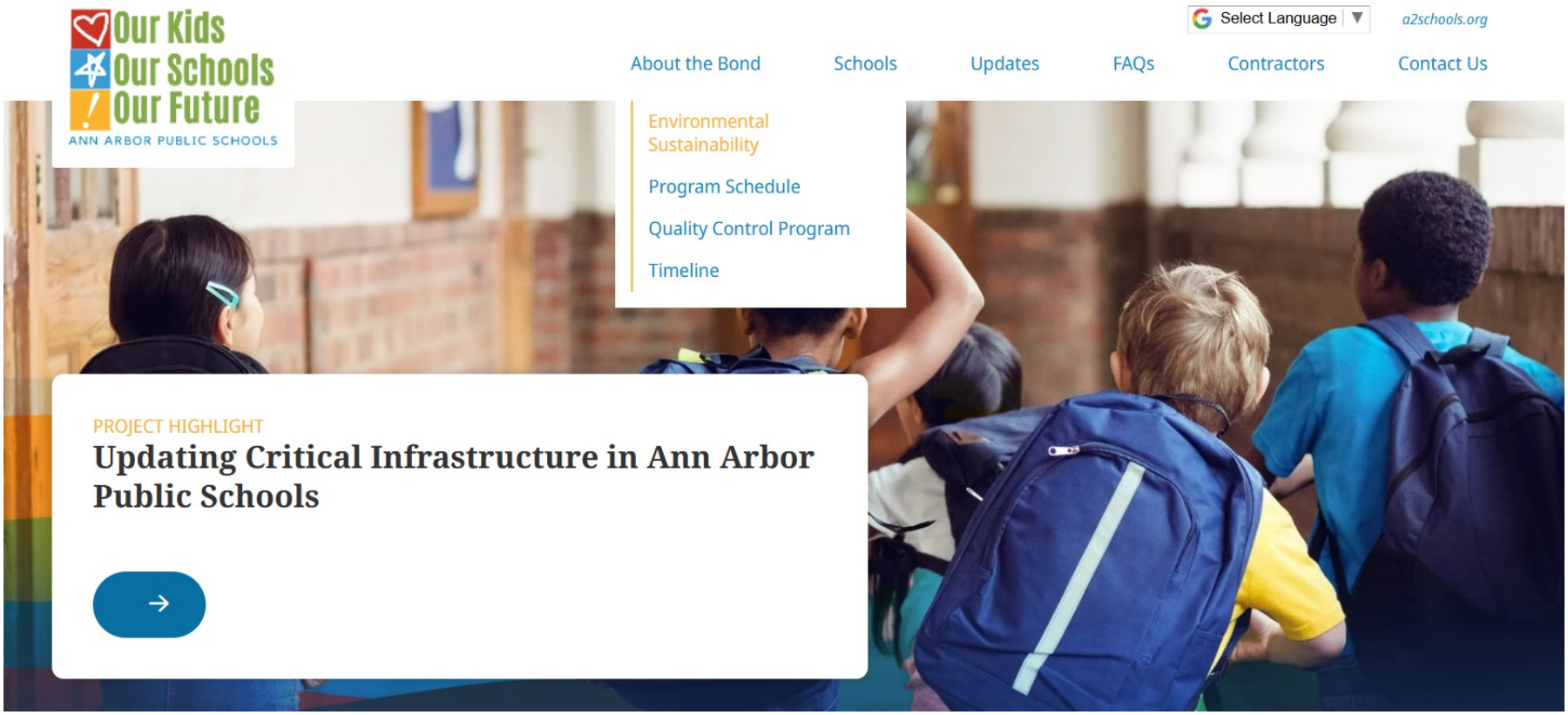
Where can we find more info and resources?

Assessments and FAQ – www.a2schoolsbond.org



Environmental Sustainability – www.a2schoolsbond.org



Environmental Sustainability – www.a2schoolsbond.org

Our Kids 4 Our Schools ! Our Future
ANN ARBOR PUBLIC SCHOOLS

Select Language | a2schools.org

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SUSTAINABILITY & ENVIRONMENTAL CONSERVATION

Through the Capital Bonds program, Ann Arbor Public Schools is leading innovative projects that support the district's sustainability goals while promoting environmental awareness among students.

Table of Contents

NEWS & PRESS

Journey Toward Sustainability: AAPS' Electric School Bus Initiative

May 13th, 2025 | Posted in: Environment & Sustainability, Success Stories, Transportation

AAPS was one of the first school districts in Michigan to use electric school buses. After a slow but successful pilot program, the district targets using 100% electric school buses by 2035*.

Related news
May 13th, 2025
Journey Toward Sustainability: AAPS' Electric School Bus Initiative

NEWS & PRESS

Transforming Lost Trees: AAPS' Urban Wood Recovery Initiative

March 7th, 2025 | Posted in: Environment & Sustainability

AAPS is recovering wood from trees that have to be removed for construction of new schools and transforming it into part of the new buildings.

Related news
May 13th, 2025
Journey Toward Sustainability: AAPS' Electric School Bus Initiative

Resources

- **AAPS Environmental Sustainability**
  - https://www.a2schools.org/departments/environmental-sustainability
  - https://www.urbanashes.com
- **AAPS Capital Program**
  - www.a2schoolsbond.org
- **Healthy Schools**
  - https://healthybuildings.hsph.harvard.edu/research/schools/
  - Indoor Air Quality (IAQ) Tools for Schools https://www.epa.gov/iaq-schools/iaq-tools-schools-resources
- **Whole Building Lifecycle Assessment (WBLCA)**
  - Carbon Leadership Forum: https://carbonleadershipforum.org/
- **Product Guidance**
  - Collaborative for High Performance Schools (CHPS) resources: https://chps.net/products

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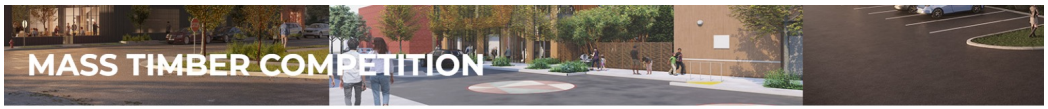
What are the Next Steps?

Innovation – *Pushing the Envelope*



Building Sustainable Schools

The 2025 Mass Timber Competition: Building Sustainable Schools is currently in the judging phase.

This year's competition will award funds totaling $1.8 million to support projects that accelerate the pace of mass timber adoption in the United States, specifically in the K-12 learning environment.

Eligible projects must be located within the United States and be a K-12 educational project including, but not limited to, classrooms, libraries, athletic facilities, offices, resource centers, portable classrooms, daycare facilities, and vocational centers.

Eligible applicants include for-profit building organizations registered in the U.S. including architects, engineers, owners, general contractors, and manufacturers; not-for-profit organizations incorporated a not-for-profit corporation or society formed in the U.S. such as trusts, religious bodies, and associations; U.S. local government entities such as public school districts, cities, counties, and states; and Native American tribal governments and organizations.

Revised Schedule

The competition will now continue along with this updated schedule.

- April 28, 2025: Deadline for submitting the Supplemental Information Form
- July 7, 2025: Judging closes and finalists notified
- Week of October 27, 2025: Public announcement

Building to Net-Zero Carbon

This competition program selected several winners in 2022 and 2023.

Designed to expand the use of mass timber in the United States, the 2022 and 2023 **Mass Timber Competition: Building to Net-Zero Carbon** programs awarded several projects that highlight mass

PROJECT SCOPE

- Design and construction of a **new healthy, net zero energy** neighborhood elementary school to replace a 62 year old facility;
- Significant improvements to **indoor air quality, student/occupant comfort, safety and security, student transportation, technology and systems, and green infrastructure** measures;
- Increased **square footage and programmatic amenities** to provide for high quality, 21st-century flexible learning environments for students and teachers, including new outdoor classrooms;
- Utilization and **integration of Mass Timber** structural systems;
- Project planned to achieve Verified Leader **green building certification** through the US Collaborative for High Performance Schools (US-CHPS) rating system;
- Proposed improvements to support **shared community benefits** along the boundary with Lawton Park; and
- Proposed project **allows the existing school to operate on site** as a new school is constructed, keeping the school community together and eliminating the need to relocate students elsewhere.

PROPOSED SCHEDULE:
Spring 2026 - *Break Ground*
Fall 2028 - *New School Opens*
Spring 2029 - *Park and Campus Restoration Complete*

FOR MORE INFORMATION:
www.a2schoolsbond.org

DID YOU KNOW?
-Students spend 80-90% of their typical school day indoors;
-Other than the home, a student will spend more time inside a school building than any other location up until they graduate;
-Research indicates that **healthy buildings can promote student health**; and
-Research indicates healthier students lead to better cognitive function and opportunities in the classroom

FOR MORE INFORMATION:
https://healthybuildings.hsph.harvard.edu/research/schools/

PROJECT BENEFITS

- Designed to **support the health and wellness of students, staff** and visitors
- **Reduced energy use, operating costs, and carbon** impacts
- **Safer and more secure school building for students, staff** and school community
- Proposed project **supports commitments through the 2019 Bond and** Environmental Sustainability Framework carbon neutrality goals, and the building as a teaching tool;
- Green infrastructure supports stormwater conditions onsite and development of habitats;
- Supports long-term enhancements of Lawton Park and **collaboration with the city for mutual benefits**, such as pathways, play areas, and climate resiliency efforts; and
- As proposed the New Lawton Elementary school is anticipated to be **one of the most environmentally sustainable K-12 school buildings in Michigan** and an exemplar for this climate region.

Our Kids Our Schools Our Future

Stay Informed
Frequently Asked Questions: https://a2schoolsbond.org/faqs/
Sign up for Updates by visiting www.a2schoolsbond.org

Innovation

THE CUT MODEL

URBAN WOOD
& CARBON

URBAN ASHES

URBAN WOOD RECYCLING SYSTEMS & MARKET DEVELOPMENT

Creating Social Equity, Economic Diversity and Environmental Sustainability

~12.7 MILLION

Metric Tonnes of Dried Urban Lumber is Available to be Produced Every Year in America.*

Instead, the vast majority of our fallen urban trees are chipped, burned or landfilled.

** Urban Forestry & Urban Greening 46 (2019), Annual biomass loss and potential value of urban tree waste in the United States, David J. Nowak, Eric J. Greenfield, Ryan M. Aeh*

~6.35 MILLION

Metric Tonnes of Carbon is Available to Continue to be Sequestered within Durable Urban Wood Products, Every Year in America.*

Instead, the vast majority of our fallen urban trees are chipped, burned or landfilled.

** Based upon an average 3.5lbs per dried board foot*
** Dried wood on average is 50% Carbon by weight*

Innovation

2024

Business Plan:

Freeman Environmental Education Center
Educational Plant Nursery

Conclusion

The business model aims to create a sustainable and impactful native plant nursery that empowers students, supports environmental education, and enriches the local ecosystem. By fostering hands-on learning and community engagement, the model positions the nursery as a valuable resource for ecological restoration and climate resilience within Ann Arbor Public Schools and the broader community. This initiative will not only strengthen environmental stewardship among students but also establish the Freeman Environmental Education Center as a leader in sustainable education and community-driven conservation. This model is designed to ensure the nursery's long-term financial stability and environmental sustainability, enabling it to achieve the desired impact. As a living document, it will evolve as the nursery grows, adapting to new opportunities and the changing needs of the community.

AAPS - Implementing Sustainable Practices

Focus on Energy

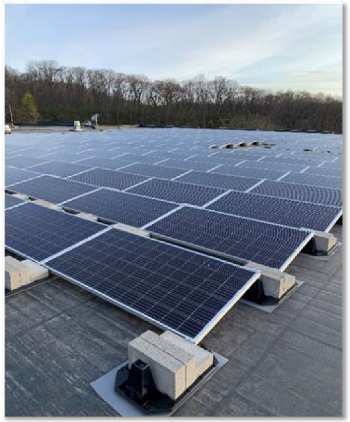
- **Solar**

  AAPS is the largest K-12 public school district owner/operator of solar in the State of Michigan

- **Geothermal**

  AAPS operates one of the largest portfolios of geothermal operations in Washtenaw County

Pattengill



Huron

Haisley

A2 STEAM

ANN ARBOR PUBLIC SCHOOLS

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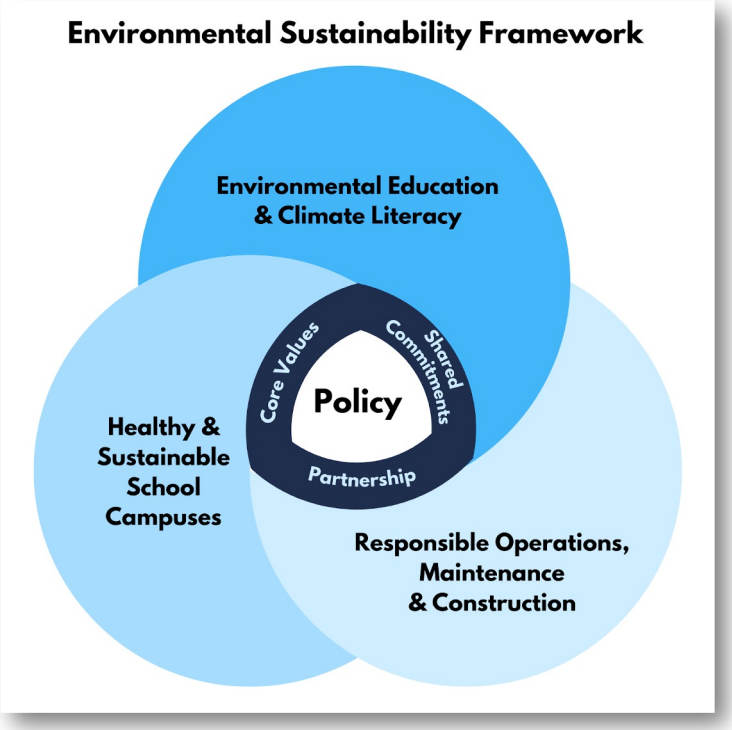
Summary

Decarbonizing AAPS School Buildings

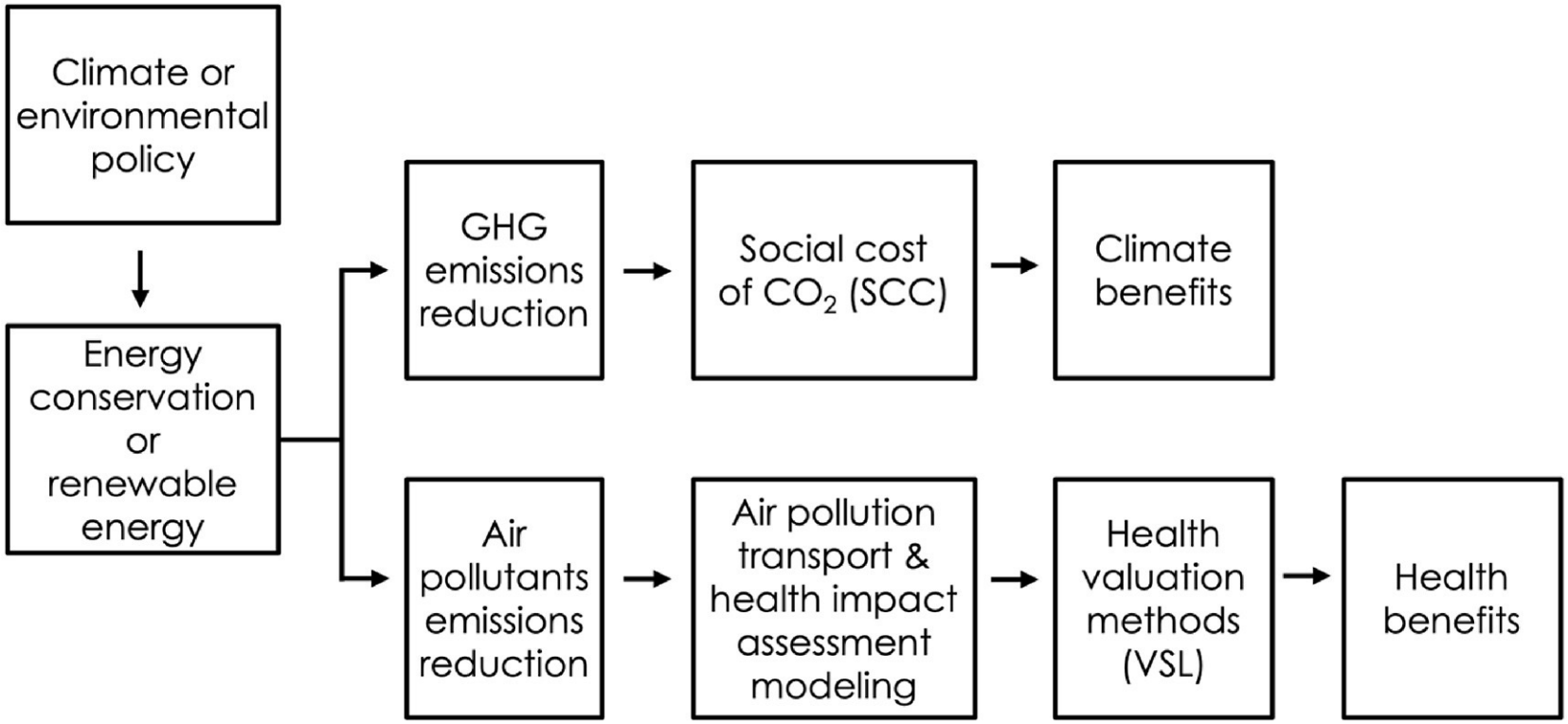
The District's **commitment to carbon neutrality** – specifically the target to offset or eliminate Scope 1 and 2 emissions by 2035 – is a response to the urgent need for greenhouse gas emission reductions and is intended to directly impact the health and well-being of not only students, staff, and school community, but all living things, and the natural systems that will shape a hopeful future for our students.

Carbon neutral schools are healthy, energy efficient buildings with primary all-electric heating and cooling systems that:

- **Provide healthy, comfortable, and productive learning environments**
- **Redirect money from utility bills to the classroom**
- Provide tangible learning opportunities for future focused skills
- And can encourage students to take a more active role in environmental sustainability and their own learning needs



Why Environmental Sustainability?



https://www.sciencedirect.com/science/article/pii/S0360132323006455?via%3Dihub

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Environmental Sustainability
Spring 2025 Update

Board of Education – May 21, 2025

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Capital Programs and Physical Properties

Jason Bing, Director
Capital Programs

Stephanie Corona, Project Executive
Gilbane Building Company

Kevin Stansbury, Project Design Manager
Gilbane Building Company