

The **Efficient and Healthy Schools Program** aims to motivate and empower K-12 schools to reduce energy costs and improve energy efficiency, health, and resilience. The Program connects schools with practical solutions, provides technical assistance and resources, to significantly improve school facilities. This Program is led by the U.S. Department of Energy Building Technologies Office with technical support from Lawrence Berkeley National Lab and New Buildings Institute.

CASE STUDY

Retrofit Revolutionary: River Trails School District 26



Project Scope & Approach

River Trails School District 26 (RTSD) has a comprehensive commitment to sustainability that encompasses its policies and practices, including operations and facilities management. In line with these policies, the district opted for a deep-energy retrofit of a 1960s era building to develop a highly efficient early childhood education facility. RTSD worked with a large design team to secure multiple grants and set the ambitious target of net-zero energy use for the completed building. To achieve this target, the team touched every part of the building, including increasing the insulation of the walls and roof, completely replacing the HVAC and building automation systems, installing new windows, and installing an onsite solar array. Throughout this process, Prairie Trails School (PTS) also incorporated learning opportunities for its young students, including a curriculum that integrates science, nature, technology, and sustainability into the classroom.

Project Outcomes & Lessons Learned

Perhaps the most significant outcome of this project is the achievement of PTS as the nation's first net-zero energy school that also meets the 2018 Passive House Institute US+ Source Zero project standard. PTS was designed for a projected operational EUI of 24 kBtu/ft²-yr before incorporating the onsite solar. In the first year of operation (2021-2022 school year), the school achieved its net-zero energy goal – the building used 188,348 kWh and produced 230,700 kWh. The district anticipates saving an estimated \$32,000 in energy costs annually. As of March 2024, the school has saved 892,190 pounds of CO₂e, the equivalent of planting 6,242 trees.

Learnings from this project have informed the next wave of RTSD's sustainability efforts, including infrastructure upgrades and the installation of a microgrid at Euclid Elementary.

PROJECT HIGHLIGHTS

After the first year of operation, the building uses 67% less energy than conventionally designed buildings, and 100% of its electricity generation is from solar panels.

- High performance HVAC system creates quiet, comfortable classrooms.
- Energy dashboards track system performance in real time.
- MERV15 filtration pulls virus particles out of the air stream.
- Nation's first 2018 PHIUS+ Source Zero school building.
- Commissioned to meet 2018 IECC Code requirements.
- Drastically reduced water usage with a higher building occupancy.

Project Details

Location: Mount Prospect, IL

Number of Students: 1,584

Schools in District: 4

Locale: Suburb

Percent Free and Reduced Price Meal: 29%

Project Cost: \$12,989,507

Cost/ft²: \$452

Funding Mechanism: Philanthropic grant, bond, cost savings, and district capital budget

Project Dates: Jan 2019 - Sept 2021

Design/Performance Criteria Used: Passive House Institute US

Key Project Features:

- 206 kW DC photovoltaic array
- DOAS with VRF
- New BAS
- High performance air barrier
- New insulation
- Highly insulated roof
- Triple-pane windows
- Electric water heaters