# Cool Schools

## High Performance Schools Pilot

## Year Three Status Report

January 2015

Fairview School, Klamath Falls

OREGON DEPARTMENT OF ENERGY

# COOL SCHOOLS YEAR THREE STATUS REPORT 2015

## Executive Summary

Cool Schools is a voluntary four-year pilot designed to accelerate energy efficiency investments in all of Oregon's 197 public schools districts. Over the first three years of the pilot period, the initiative provided technical and business assistance, along with leveraged financial resources such as the Small-scale Energy Loan Program, to support project development. Cool Schools is a complementary effort for the schools in PGE and Pacific Power territory that receive public purpose charge funds for energy audits and measures. It also complements school energy efficiency measures where they are implemented by consumer owned utilities.

Over the course of the four-year pilot, ODOE program staff worked with school districts in all 36 Oregon counties. School districts from 31 counties directly participated in Cool Schools, representing 814 public schools. More than $16 million in energy saving projects were installed – projects like heating system upgrades, lighting upgrades, and new windows and insulation. These projects reduced energy use, resulted in avoided energy costs, and improved classroom comfort.

While successful energy saving projects were made possible by Cool Schools, cost-effective projects remain in Oregon public schools across the state. Especially in those schools located in areas without dedicated funding for energy efficiency upgrades, school districts face financial hurdles. Even a strong business case for an energy saving project may not be enough to spur most schools to take on additional debt.

ODOE has continuously worked with districts to find the right combination of resources to help beneficial projects move forward. Based on the results of the Cool Schools pilot to date, ODOE has concluded that grant funding is a necessary element of a successful school energy efficiency program. As a result, ODOE will offer grants with criteria targeting schools in areas without dedicated funding for energy improvement projects when the agency implements the final phase of the pilot program in early 2015.

## Introduction

In his first week in office in January 2011, Governor Kitzhaber directed the Oregon Department of Energy to launch a comprehensive School Energy Audit Initiative targeting school districts served by consumer-owned utilities. The goal was to gather data to create a more comprehensive approach to energy efficiency at Oregon's public schools.

The audits, funded by the American Recovery and Reinvestment Act, were conducted at no cost to districts. To be eligible, schools had to receive their electricity from Oregon's consumer-owned utilities or Idaho Power. Schools that receive their electricity from investor-owned utilities – Portland General Electric and Pacific Power – already have access to energy audits through Senate Bill 1149,

passed in 1999, which established the collection and distribution of a public purpose charge for cost-effective energy conservation projects at eligible school facilities.

While ODOE implemented the audit initiative during the first half of 2011, the Oregon Legislature considered and unanimously passed House Bill 2960, which was developed to support energy efficiency and clean energy projects with technical assistance and expanded financing mechanisms in Oregon public schools. The legislation, signed into law on June 22, 2011, directed ODOE to establish and administer a four-year High Performance Schools Pilot Program, which quickly became known as Cool Schools.

The Governor's School Energy Audit Initiative was designed to gather information to help school administrators make informed decisions about energy improvement projects. The four-year High Performance Schools Pilot Program built on this effort, taking the next step to help schools coordinate funding for the types of measures identified in energy audits. Cool Schools was intended to be a "triple win" for Oregon: save money on energy that could be re-invested in classrooms, boost student and teacher comfort and performance, and put Oregonians back to work. A summary of these two programs and overall results from the almost four-year effort to help make Oregon schools more energy efficient are presented below.

## Governor's School Audit Initiative

The Governor's School Audit Initiative (SAI) was the first step of a statewide effort to improve energy efficiency at public schools and create jobs. Using ARRA funding, energy audits were conducted to identify cost effective energy saving opportunities that would in turn help schools make informed decisions about their facilities.

The energy audits, conducted between May 2011 and August 2011, targeted public school districts in territory served by Oregon's consumer-owned utilities and Idaho Power. Senate Bill 1149 provides public purpose charge funding to schools in PGE and Pacific Power territory, so ODOE had comprehensive audit information for most of those public schools. By conducting targeted energy audits of school facilities in COU territories, ODOE was able to begin gathering data essential to creating a more comprehensive statewide approach to energy efficiency at Oregon's public schools.

### Governor's School Audits Initiative

- 100 school district-level audit reports produced, covering 320 non-SB 1149 public K-12 schools across state.
- Each audit report identified the most appropriate energy efficiency investments from a prescriptive template of 33 energy efficiency measures
- School staff were interviewed to provide building-specific information, which was used to support the analysis

ODOE developed criteria to ensure audit consistency. The agency reached out to school districts and solicited audit firms to bid on the work. Eleven groups were selected to complete the audits, which

identified energy efficiency measures that could be implemented as soon as possible and measures that were more comprehensive and capital-intensive. The firms reported their data to ODOE, which combined the information with data from the existing SB 1149 Schools program.

Over the course of about six months, the audits identified $40 million worth of building shell and lighting projects. When additional measures such as space and water heating are factored in, ODOE estimates there may be more than $100 million in total potential energy saving projects in areas not covered by the SB 1149 Schools program. The feedback received suggested that schools were interested in pursuing energy-saving projects, but that they operate in resource-constrained environments and often are spread thin simply keeping their aging facilities operating.

### Four-Year High Performance Schools Pilot Program – Cool Schools

As the School Audits Initiative was winding down, the four-year High Performance Schools Pilot Program – also known as the Cool Schools Pilot Program – was ramping up. This program was the next step in a statewide effort to improve energy efficiency at public schools. After HB 2960 was signed into law by Governor Kitzhaber, ODOE immediately moved forward to implement the new law's provisions in coordination with the SAI efforts already underway.

As with SAI, potential benefits included job creation. But above all, the program was intended to enable energy efficiency investments in K-12 public schools. These investments would reduce energy consumption, lower districts' energy costs, and improve the educational environment for educators and students.

**Case Study: Corbett School District**

**Multnomah County – IOU Territory**

- New boiler at high school and controls throughout other District schools
- Dramatic improvement in classroom environment
- Small-scale Energy Loan Program (SELP) loan with 15-year pay-back
- District will save $20k per year during pay-back period
- Savings jump to almost $80k per year after loan is paid off

## How Cool Schools Works

The Cool Schools pilot program was designed to:

1. Provide information on energy saving opportunities in schools;
2. Help schools implement energy saving projects;
3. Provide low-interest loans for energy saving projects in schools;
4. Provide access to other funding opportunities; and
5. Find the combination of services and financial incentives that best encourage school districts to implement cost effective energy saving projects.

## Phased Implementation of Pilot

From the beginning, ODOE staff worked with school district representatives on the program. Informational webinars were held, and opportunity announcements were promoted across the state. ODOE provided information, conducted walk-throughs with school officials, and even paid for targeted energy audits when schools needed more in-depth information to make sound decisions. The goal was to provide accurate, timely, and meaningful resources that schools could use – with the recognition that no two schools are alike.

Because Cools Schools is a pilot, ODOE staff implemented the program in phases. Each phase was designed to test and evaluate the right combination of resources and services for schools. Results and lessons learned were applied to the next phase. Over three years, four different phases offered slightly different services to encourage school districts to implement cost-effective energy saving projects. In each phase, ODOE offered a combination of low-interest loans and incentives, and promoted opportunities from outside partners, to help schools finance energy upgrades to their facilities.

### Case Study: Monroe School District

### Benton County – IOU Territory

- $290,000 SELP loan through ODOE
- Energy savings from the improvements helped the school make its loan payments
- Improvements include upgrades to the district's oldest school – built in 1928 – and its youngest, which is more than 60 years old
- Annual costs for heating oil have been reduced by an average of $48,000
- Small school district that used ARRA and SB 1149 funds to implement several lighting projects and Cool Schools program to complete a boiler project.

## Offerings by Phase

| | Phase 1 | Phase 2 | Phase 3 | Phase 4 |
|---|---|---|---|---|
| **ODOE Offerings** | - Low-interest SELP loans | - Low-interest SELP loans (guaranteed interest rate)<br>- Special, one-time offering of Energy Incentive Program tax credit<br>- Free targeted audits<br>- Technical and business assistance | - Low-interest SELP loans<br>- Tax incentives<br>- Increased outreach<br>- Free targeted audits<br>- Technical and business assistance | - Low-interest SELP loans<br>- Greater emphasis on offering targeted audits<br>- Technical and business assistance<br>- Continued outreach |
| **Other Funding Opportunities** | - SB1149 Schools Program – PGE & PacifiCorp territory | - SB1149 Schools Program – PGE & PacifiCorp territory<br>- Up to $15k per school district in CEWO Pre-Construction Grants<br>- ETO- funded targeted energy audits for schools in PGE and PacifiCorp territory | - SB1149 Schools Program – PGE & PacifiCorp territory<br>- ETO-funded targeted energy audits for schools in PGE and PacifiCorp territory | - SB1149 Schools Program – PGE & PacifiCorp territory<br>- ETO-funded targeted energy audits for schools in PGE and PacifiCorp territory |
| **# of Registered School Districts** | 9 | 50 | 28 | 27 |
| **# of School Districts with SELP Loans** | 8 | 9 | 1 | 2 |
| **Loan Value** | $4.8M in SELP | $4.8M in SELP | $1.2M in SELP | $1.1M in SELP |
| **Value Installed Projects** | > $5.3M | > $8.5M | > $1.2M | > $1M |

## Continuous Improvement

The agency took feedback from school districts to improve the program. During phase one, for example, ODOE learned that school districts needed more certainty on loan interest rates. Because Small-scale Energy Loan Program (SELP) interest rates can vary due to bond sale timing, many schools started the process without knowing for certain just how low their low-interest loan would be. The agency experimented with guaranteed loan rates in the second phase and with tax credits designed specifically for schools in phase three. ODOE reached out to partners like the Energy Trust of Oregon and Clean Energy Works to leverage more dollars for school projects. In phase two, leveraged grants from Clean Energy Works Oregon went to 18 school districts around the state.

ODOE dedicated expertise to helping districts with strong business cases for investment in energy efficiency. Staff learned that school districts need an extended period of time to both consider and implement projects, and that information from energy audits was more helpful to schools when it could be timed with school board meetings and school district procurement requirements. In addition, timing of installation is almost as critical as the installed measures themselves to minimize disruptions to classrooms.

ODOE also learned that missing project information (e.g., estimated project cost, avoided energy costs, cost effectiveness, etc.) was enough to stall or stop a project from moving forward or even beginning. This prompted the agency to continually increase its offering of business and technical assistance to school districts – assistance that was crucial to districts with limited staffing resources.

**Case Study:**

**Klamath Falls School District**

**Klamath County – IOU Territory**

- $400,000 SELP loan through ODOE
- Improvements made at 12 facilities
- Strong support, with full-time electrician and maintenance crew dedicated to operating equipment to full potential
- Full payback expected in about 10 years

"We think it is a win-win situation because instead of spending money on utility costs, [we] can utilize funds to make savings for years down the road for staffing needs."

*– Pat Baldini,*

*Business Manager for the District*

## Location and Types of Projects Completed

ODOE staff engaged with school districts in all 36 counties, though not all districts moved forward to implement energy saving measures. When working with schools, the agency provided technical assistance, best practices research, design guidelines, and financing to encourage school safety, effectiveness, and affordable operations of the various projects schools opted to pursue. Details on implemented projects below:

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| County | School District | # of Schools | IOU COU* | SELP Loan Amt.** | Building Envelope | HVAC | Lighting | Other*** |
|---|---|---|---|---|---|---|---|---|
| Baker | Pine-Eagle | 1 | IOU | 13,750 | X | | | |
| Benton | Monroe | 1 | IOU | 343,593 | | X | | |
| Clackamas | N. Clackamas | 11 | IOU | - | X | X | X | X |
| | Oregon City | 3 | IOU | 500,000 | X | X | X | X |
| Clatsop | Seaside | 1 | IOU | 326,570 | | X | | X |
| Columbia | Vernonia | 1 | COU | 2,237,342 | X | X | X | X |
| Coos | Powers | 1 | IOU | 202,000 | | X | | |
| Deschutes | Redmond | 4 | IOU | - | X | X | X | X |
| Jefferson | Culver | 1 | IOU | - | | | | X |
| Klamath | Klamath County | 6 | IOU | 1,876,000 | | X | X | X |
| | Klamath Falls City | 7 | IOU | 400,000 | | X | X | X |
| Linn | Central Linn | 2 | IOU | 750,000 | | X | | X |
| | Santiam Canyon | 1 | IOU | 195,000 | | X | | X |
| Lane | Crow Applegate Loraine | 1 | COU | 151,157 | X | | X | X |
| | Lowell | 2 | COU | 1,422,955 | X | X | | X |
| Marion | Cascade | 2 | IOU | - | | | | X |
| | Jefferson | 3 | IOU | 803,659 | | X | | X |
| Multnomah | Centennial | 8 | IOU | - | X | X | X | X |
| | Corbett | 3 | IOU | 583,136 | | | | X |
| | David Douglas | 2 | IOU | - | X | | X | X |
| Umatilla | Milton-Freewater | 1 | IOU | 163,000 | X | | | X |
| Union | Union | 3 | COU | 370,000 | X | X | | X |
| Washington | Banks | 3 | IOU | 636,538 | X | X | X | X |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Beaverton | 1 | IOU | - | | | | X |
| Yamill | Amity | 2 | IOU | - | | | X | X |
| | Newberg | 8 | IOU | 1,000,000 | X | X | X | X |

***IOU/COU** – investor-owned utility or consumer-owned utility; refers to the type of electric utility serving the school where the project was implemented. Schools in IOU service districts have access to grant funding from SB 1149, which resulted in more completed projects in these areas.

****SELP Loan amount** is for loans underwritten by ODOE and may not reflect the total project costs. Many projects included additional SB 1149 funding. Projects that did not receive a SELP loan used SB 1149 funds and/or other district funds.

***Other** includes lighting controls, occupancy sensors, direct digital controls, variable air volume systems, steam trap repair and replacement, thermostats and domestic hot water retrofits.

**Case Study: Union School District**

**Union County – COU Territory**

- Strong partnership between the school district and Oregon Trail Electric Consumers Cooperative and Avista, the district's natural gas provider
- New gas-fired, forced-air heating system in the high school gym.
- Steam boiler replaced with smaller, more efficient model.
- Added insulation, installed new dampers, and retrofitted lighting fixtures.
- Installed occupancy sensors and new high-efficiency natural gas water heaters.
- Small-scale Energy Loan Program (SELP) loan with 15-year pay-back
- Measures designed to yield at least 20 percent energy savings.

## Energy Savings

Cool Schools projects implemented through the first three years of the pilot resulted in energy savings across fuel types and sources. Reported savings through October 2014:

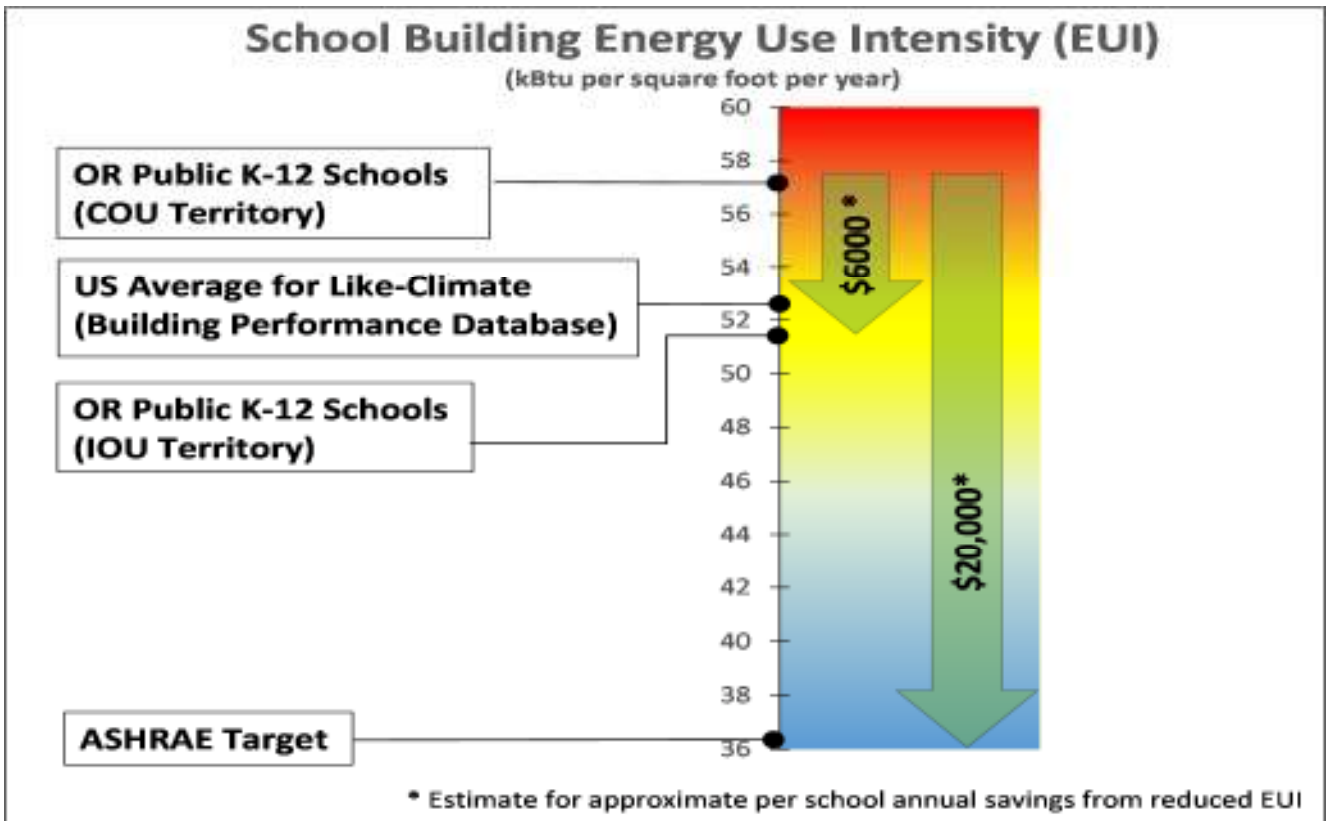
| Energy Savings: Electricity (kWh) | Energy Cost Savings: Electricity ($/year) | Energy Savings: Natural Gas (therms) | Energy Cost Savings: Natural Gas ($/year) |
|---|---|---|---|
| **2,957,532** | **$217,746** | **233,310** | **$163,841** |
| Energy Savings: Diesel (gallons) | Energy Cost Savings: Diesel ($) | Energy Savings: Propane (gallons) | Energy Cost Savings: Propane |
| **91,828** | **$290,733** | **-2,435** | **-$5,018** |

These energy savings translate to more than $668,800 in cost savings per year for participating school districts.

Not surprisingly, districts that install energy efficiency projects reduce their energy use and lower their energy costs. Differences in average energy use are also seen when school districts are compared by their respective funding sources and opportunities. Audits and other data collected by ODOE demonstrate the effect of having a dedicated stream of funding for energy savings projects. Schools covered eligible for the SB 1149 Schools Program used an average of 51 kBtu per square foot per year of energy. Non-SB 1149 schools studied under the SAI program used an average of 57 kBtu per square foot per year.

As the chart on the next page shows, average energy use is 52 kBtu per square foot per year for schools in U.S. locations with weather similar to Oregon, according to U.S. DOE's Building Performance Database. In Oregon, those schools with money targeted specifically for energy savings are able to implement projects that reduce their energy use to below the national average and save them money, as reflected in ODOE program participant data. The Cool Schools pilot has demonstrated that additional grant funds would help schools move toward the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) target of 36 kBtu per square foot per year.

### Comparing Average Energy Use at Districts in COU/IOU Territory




## Cool Schools Pilot Program – Major Takeaways

93 school districts (47 percent of all Oregon school districts) representing 803 schools (or 68 percent of all Oregon public K-12 schools) registered for the Cool Schools Pilot Program.

1. An additional 11 other public schools registered – nine from the Oregon Youth Authority, and two from the Oregon School for the Deaf.
2. 124 separate energy studies were funded and conducted through the Cool Schools Pilot Program.
3. More than $16 million in energy saving projects were completed through September 30, 2014.
4. Avoided energy costs from implemented projects equals $669,000 per year.

### *Benefits Extend Beyond Energy and Cost Savings*

"Best of all, the annoying humming sound of the old lights is gone. Sometimes we wouldn't even turn on the old lights because the noise is distracting."

*– Fossil School District*

"The immediate impact will be a warmer building. The longer term impact will be freeing up resources for learning instead of heat."

*– Pine Eagle School District*

Program participation for the first phase of Cool Schools shows nearly every school district that registered followed through on projects. The second phase also had good participation. ODOE is still receiving data from schools that participated in phases three and four. Generally, the agency observed projects in the latter phases moved forward more slowly. Schools that participated in phase one had more established projects, with planning well underway by the time HB 2960 was passed. ODOE has continued to work with schools recognizing that districts move projects forward on different timetables.

Results from the Cool Schools pilot showed that low interest rates alone were generally not enough to spur a potential project to move forward. In fact, the results suggest that most of the implemented projects directly benefitted from additional dedicated funding streams; low-interest loans were just one component that made a project attractive, and some school districts did not need ODOE-financed loans to fund their projects. Districts in SB 1149 have dedicated funding for energy projects, and, of the $16 million worth of projects installed during the Cool Schools pilot, $11.6 million, or 72 percent, was in SB 1149 territory. Schools in COU territory were less likely to implement projects.

Similarly, energy audits proved invaluable at helping school districts better understand both the opportunities and costs of moving forward with projects. But even as demand for audits rose, it became clear that information was not enough to spur a school to finance new projects.

The reasons for this are varied. The Cool Schools pilot rolled out during a prolonged recession that affected the entire state and hit rural Oregon counties particularly hard. This affected decisions about financing. Many districts wrangled with broader community discussions about budgets, classroom sizes, or taxes. Schools that had to lay off teachers did not necessarily have the best climate for discussions about replacing boilers. Even projects with excellent pay-back schedules, and that made financial and environmental sense for a district, could be delayed or shelved if they appeared to take dollars out of the classroom.

Some districts, however, were willing to take on new debt. As shown in the table on page seven, the majority of these projects took place in IOU territory where schools had other resources to leverage. ODOE had similar experiences during ARRA when it awarded school districts more than $15 million in grant funds for lighting, HVAC, and weatherization. The schools that had access to dedicated energy conservation resources came to the table with identified, viable measures and were more competitive in the funding process.

## Conclusion and Next Steps

The Oregon Legislature charged ODOE with providing Oregon schools with resources for energy improvement projects. With this authority, ODOE provided low-interest SELP loans to school districts that qualified, and these loans made significant, often dramatic improvements in schools where they were applied. Both the financial support and the non-financial support – such as audits, general

guidance, and technical expertise – provided critical help for districts to improve classroom comfort and save both energy and money.

As the pilot moves into its final phase, ODOE continues to engage with school districts. The agency's compliance team has reached out to districts that have installed projects to learn how the measures are performing. The team has visited 16 school districts since August 2014, with an emphasis on districts in rural counties. During site visits, ODOE staff meet with school district staff to discuss if the project has improved operations, if the project would have gone forward without funding assistance, and if the project has provided any non-energy benefits.

The agency also continues to make technical resources and loan information available, yet from regular engagement with school districts, the agency has learned that school boards, administrators, and communities are hesitant to take on debt. The Cool Schools pilot demonstrates the positive impact additional funding streams, specifically SB 1149, have had on a school district's implementation of energy efficiency projects – and in turn the effect these projects have had on schools' energy efficiency. Schools with this funding were more likely to implement projects and have lower energy costs per square foot.

With limited funds as the largest reported hurdle for many schools, ODOE will offer a small grant program in early 2015 to confirm the primary lesson-learned from the pilot that grant funding will bring more schools, especially those without dedicated sources of funding, to the table to implement cost-effective energy projects.

This final phase of the pilot is important because the need still exists. Oregon has approximately 1,200 K-12 public schools. Roughly 850 of those schools have a dedicated funding source through SB 1149 for energy saving projects. While some of the remaining schools can benefit from COU energy efficiency programs, this leaves almost 350 public K-12 schools without dedicated funding for projects that could mean the difference between a classroom that starts the day at 52 degrees and one that is comfortable and ready for students to come and learn. An extrapolation from the hundreds of audits conducted, compared to the projects that have been implemented, shows that at least $100 million in identified improvements remain in non-SB 1149 territory.

As phase five moves forward, and as the Oregon Legislature considers a request for a larger grant program in the 2015 session, the agency will continue to be responsive and provide services to Oregon school districts. Cool Schools was meant to be one tool in the toolbox to support wise energy use at Oregon schools. ODOE is committed to helping every school district across the state secure resources to support cost-effective projects that improve energy efficiency and classroom comfort.