Menu of Solutions

100% RENEWABLE ENERGY RESOLUTIONS

Passing a 100% renewable energy resolution in a school district commits the district to transitioning from existing energy sources that use fossil fuels to using clean energy sources for all operational needs. Generally, these resolutions include a target year by which the transition will be made along with potential intermediate goals.

Benefits

- Reduces greenhouse gas emissions for the district with implementation.
- Saves districts money on energy costs. Energy costs are currently the second highest costs for districts, and transitioning school districts to clean renewable energy can significantly reduce and potentially eliminate those annual costs.
- Creates learning and leadership opportunities for students. Many successful campaigns for clean energy resolutions have been led by students and continue to involve students in implementation.

Addressing Barriers

- Garnering support from school board members to pass a resolution is a potential barrier. Collaboration between students, parents, educators, and school board members and effective messaging and communication can build support.
- Securing funding for clean energy transitions and energy efficiency upgrades can be a barrier. Leveraging local, state, and federal funds and establishing public-private partnerships can lower upfront costs.
- Effective implementation is critical for successful follow through of clean energy resolutions. Planning for implementation early on and collaborating with students, parents, and educators on implementation plans can help districts set themselves up for success.

Success Stories

- Salt Lake City School District passed a 100% clean energy resolution in June 2020, committing to use 100% renewable energy for electricity by 2030 and 100% carbon neutral energy for all energy uses by 2040.
- In December 2019, Los Angeles Unified School District passed a resolution committing to transition to 100% clean, renewable energy by 2040.

CLIMATE CHANGE EDUCATION COORDINATOR

A climate change education coordinator in a school district can help integrate cross-curricular climate change education and support educators in teaching about climate change, climate solutions, and sustainability.

Benefits

- Can identify cross-curricular opportunities for climate education across all grade levels.
- Can provide professional development and embedded and ongoing support for educators on climate education.

Addressing Barriers

- Funding can be a barrier to hiring a climate change education coordinator. Searching funding opportunities such as grants can help cover costs.

Success Stories

- In Oregon, Portland Public Schools hired a Climate Justice Programs Manager to support teaching and learning about climate change and climate justice across grades and subjects and co-design curricula with students.

CLIMATE CHANGE IN STATE STANDARDS

State standards set expectations for what students should know and be able to do in each subject at each grade level. Including climate change in state standards helps schools ensure students have a foundational understanding of climate change so they can make decisions that protect their communities and prepare them for the future.

Benefits

- Sets an expectation that all students across the state will have the opportunity to learn about climate change.
- Opens opportunities for states to provide more support to educators and school leaders on teaching about climate change to implement state standards.

Addressing Barriers

- State laws may dictate when state standards can be revised, which can be a barrier. Learning about when and how your state revises standards can help determine the most effective opportunities to integrate climate change.
- Curriculum debates can be a challenge in including climate change education in schools. Focusing on local climate impacts, sustainability, and environmental conservation can build community support.

Success Stories

- In 2020, New Jersey became the first state in the country to revise its state standards to include climate change across grade levels and subjects.

COMPOSTING

Composting is a way to convert food waste into a natural fertilizer. As food sits in landfills, it emits methane, a potent greenhouse gas that contributes to climate change. Composting helps to divert food waste from landfills, which reduces greenhouse gas emissions.

Benefits

- Composting programs in school cafeterias provide opportunities for sustainability education and student leadership.
- Compost can be used as a natural fertilizer in school gardens or in the community.

Addressing Barriers

- Meeting all composting needs on-site can be a barrier. Partnering with community-based organizations can help schools create and implement structures that support some on-site and off-site composting.
- Buy-in from school leaders and staff can be a challenge for establishing school composting programs. Educating and training school staff on composting benefits and processes can help with implementation.

Success Stories

- San Diego Unified School District's food waste reduction program, called Love Food Not Waste, includes support for composting food waste from school cafeterias. The program, which includes food donation as well as composting, has rescued 530,900 pounds of food from schools and eliminated 275,200 pounds of greenhouse gas emissions.

CURRICULUM SUPPORTS ON CLIMATE CHANGE AND SUSTAINABILITY

Curriculum supports can include frameworks, lesson plans, and other materials that help educators teach about climate change, sustainability, and the environment. Curriculum and related supports can be developed collaboratively with educators, students, and community-based organizations and aligned to state standards.

Benefits

- Gives educators tools to teach about climate change, sustainability, and the environment.
- Can help more students access education on climate change, sustainability, and other environmental topics.
- Can support implementation of state standards that include climate change and sustainability.

Addressing Barriers

- Capacity can be a barrier to developing and implementing robust curriculum supports. Partnering with environmental education and community-based organizations can help increase capacity.

Success Stories

- In California, the state recently provided funding to San Mateo County to develop open access climate change and environmental justice curricula for all grades that align with the state's required environmental principles and concepts.
- The National Wildlife Fund's Resilient Schools Consortium (RiSC) helps students learn about how climate impacts will affect their communities and what they can do to make their communities more resilient. The curriculum uses hands-on, place-based learning to teach about coastal resilience and extreme heat in New York City schools.
- In Seattle, the Learning in Places project is working with students, educators, and families to co-design culturally relevant science curriculum for grades K-3. The program uses school gardens and community green spaces to help students learn about ecological reasoning and decision-making in their communities.

Photos by Allison Shelley for American Education: Images of Teachers and Students in Action.

EDUCATOR PROFESSIONAL DEVELOPMENT ON CLIMATE CHANGE AND SUSTAINABILITY

In-service professional development (PD) provides educators with knowledge and instructional tools they can use to improve teaching and learning in their classrooms. PD focused on climate change, climate solutions, and sustainability helps prepare and empower teachers to include these topics as they are teaching.

Benefits

- Supports educator's knowledge of climate change, climate solutions, and sustainability and how these topics can be incorporated across the curriculum.

Addressing Barriers

- Capacity can be a barrier to increasing PD opportunities. Educators already have PD requirements and many constraints on their time. Embedding PD on climate change into existing PD opportunities can help reduce capacity constraints.
- Ineffective implementation can be a barrier to successful PD. Research shows that PD is most effective when educators receive continued support and coaching on incorporating what they have learned into their practice.

Success Stories

- In Washington State, the ClimeTime network is a state-funded professional development program where educators have the opportunity to collaboratively develop knowledge, skills, awareness, and tools to teach climate science.
- Arizona State University's Sustainability Teachers' Academies provide workshops on teaching about sustainability. Each workshop involves 200 hours of hands-on, interactive professional development for K-12 educators across the country.

ELECTRIC SCHOOL BUSES

Electric school buses run on electricity rather than diesel fuel — a leading contributor to air pollution and greenhouse gas emissions.

Benefits

- Supports students' health. Electric school buses do not have tailpipe emissions that contribute to air pollution and have been linked to childhood asthma and absenteeism.
- Saves districts money in the long-run. Each bus saves an average of $170,000 in maintenance and operation costs over its lifetime.

Addressing Barriers

- The upfront costs for electric school buses are higher than diesel school buses and buses require charging infrastructure. Public-private partnerships, grants, and government support can make electric school buses more affordable.

Success Stories

- In California, Stockton Unified School District is supporting the transition to electric school buses through grants from the California Air Resources Board, the California Energy Commission, and rebates from the district's local utility company. Less than a year after submitting the first grant proposal, the district has built charging stations and acquired its first set of electric buses.
- In Maryland, Montgomery County Public Schools recently announced a plan to transition its entire bus fleet to electric through a partnership with Highland Electric Transportation. Highland Electric will lease the buses to the district and take care of maintenance and operations for the same price the district would typically pay to purchase and maintain a diesel bus, which avoids the challenge of higher upfront costs.

ENERGY EFFICIENCY EDUCATION

Education on energy efficiency helps students, educators, and other school staff understand the importance of conserving energy and what they can do to conserve.

Benefits

- Helps lower energy use, which makes it easier for schools to become net-zero energy or close to net-zero energy.
- Creates opportunities for hands-on learning and student leadership on energy efficiency and climate mitigation.

Addressing Barriers

- Capacity can be a barrier to coordinated energy efficiency education. Partnering with local businesses or community-based organizations and hiring a district sustainability manager can help build capacity and support implementation.

Success Stories

- In California, Stockton Unified School District, students are involved in the energy patrol, which helps teach students and staff about reducing energy use and practicing energy conservation.

GEOTHERMAL HEATING AND COOLING

Geothermal heating and cooling uses the Earth's underground stable temperature to provide heating and cooling for buildings through a network of pipes and wells dug into the ground. Geothermal heating and cooling replace gas heating systems and inefficient HVAC systems, reducing schools' greenhouse gas emissions.

Benefits

- Geothermal heating and cooling is an efficient, reliable, and sustainable system for heating and cooling school buildings.
- Geothermal heating and cooling saves schools money on operations costs as the systems generally need less maintenance than traditional heating and cooling systems.

Addressing Barriers

- Some school sites may not be compatible with geothermal heating and cooling due to soil composition or space constraints and upfront costs can be a barrier. Working with engineers can help determine best sites for geothermal and the potential payoff period when factoring in annual savings.

Success Stories

- In West Virginia, Berkeley County Schools installed geothermal heating and cooling systems in seven schools and made additional energy efficiency upgrades, resulting in a 75% decrease in energy use in those schools.

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GREEN CAREER AND TECHNICAL EDUCATION (CTE)

Green career and technical education (CTE) programs or pathways focus on sustainability and clean energy jobs to prepare students for success in the clean economy. Jobs in the clean energy sector are among the fastest growing in the country and as climate change continues to impact society, all industries will need to adapt and become more sustainable.

Benefits

- Prepares students to be successful in in-demand, high-wage, high-skill jobs that will increasingly become available with the clean economy.
- Helps employers by ensuring young people are prepared for success in the clean economy workforce.

Addressing Barriers

- Insufficient educator knowledge and skills related to sustainability and clean energy can be a barrier to expanding green CTE programs. Establishing partnerships with businesses and institutions of higher education can help increase capacity and support educators.

Success Stories

- P-TECH schools have CTE programs that let students both explore careers related to sustainability and climate change and learn the technical skills needed to qualify for high-skill, high-wage jobs. Students at P-TECH schools graduate with a high school diploma and an associate's degree in six years and are first in line for jobs with industry partners.
- The Environmental Sciences and Climate Institute (ESCI), a new collaborative between several school districts and community colleges in rural southwest Colorado is designed in collaboration with community colleges and includes project-based learning and exposure to climate related careers including emergency management.

GREEN SCHOOLYARDS

Green sustainable schoolyards replace heat-trapping asphalt with outdoor spaces that incorporate grass, trees, or other native plants creating healthy spaces for students to learn and play. Some green schoolyards have edible gardens, rain gardens, or other elements that support learning about sustainability and the environment.

Benefits

- Supports student and community health by reducing the impacts of high heat, which presents greater risks to children and low-income communities of color.
- Provides outdoor learning opportunities for students and healthy space for students to learn and play.

Addressing Barriers

- Funding can be a potential barrier. Creating partnerships with non-profit organizations and municipal agencies can help schools secure funding for design, construction, and upkeep.

Success Stories

- The School District of Philadelphia has worked with non-profits and city agencies to create sustainable schoolyards with green stormwater management in over 30 schools. Many other schools in the district have been updated to include school gardens or other green elements.
- In Chicago, the Space to Grow initiative is a partnership between Chicago Public Schools, two municipal water agencies, and two non-profit organizations. The initiative has worked with school communities to design, construct, and maintain 25 green schoolyards primarily in under-resourced neighborhoods.

LOCAL FOOD PROCUREMENT

Districts obtain school food in accordance with state and local policies on food safety, nutrition, and procurement processes. Policies such as local food procurement incentives and farm-to-school programs make it easier for districts to obtain school food from local farms and other food producers. These policies reduce the distance that food travels to arrive at schools, which decreases the amount of greenhouse gases emitted from transportation, and they can also promote more sustainable food choices when partnering with local farms.

Benefits

- Supports local farms and food producers financially by incentivizing districts to buy from local businesses.
- Incentivizing districts to procure food from local farms can help increase fresh produce offered in schools, which supports student health.

Addressing Barriers

- Lack of school kitchen equipment for cooking from scratch can be a barrier to incorporating locally-grown produce into school meals. Grants and other funding opportunities can help schools and districts update their kitchens with necessary equipment.
- Many districts work with food service management companies to provide school food, which can be a barrier to serving local food. Districts can work with distributors to prioritize sourcing ingredients locally.

Success Stories

- In Texas, Austin Independent School District partners with the Good Food Purchasing Program to incorporate locally-produced food in schools by partnering with local farms and local wholesale food producers. During the 2015-16 school year, 47% of the district's food came from local producers.
- The New Mexico Grown program is a state grant program that incentivizes districts who participate in the National School Lunch Program to serve local fruits and vegetables for meals and snacks. The program is managed by a Farm to School Specialist at the state's Department of Public Education.

Photo by Allison Shelley for American Education: Images of Teachers and Students in Action.

NET-ZERO ENERGY SCHOOLS

Net-zero energy schools produce as much clean energy as they consume throughout the course of a year. Most schools accomplish this through a combination of energy efficiency improvements, building design, energy education, and renewable energy.

Benefits

- Reduces greenhouse gas emissions and school energy and operations costs. Funds saved on energy can be repurposed to support teaching and learning.
- Provides hands-on opportunities for students to learn about sustainable infrastructure and energy conservation.

Addressing Barriers

- Despite assumptions about higher cost, the design and construction of net-zero energy school buildings can often be built for the same cost as school buildings that are not net-zero energy.
- Limitations of certain school sites may be a barrier to net-zero energy schools, particularly when renovating existing buildings. For example, some school roofs may not be compatible with solar panel installations. Schools that are unable to be fully net-zero energy can still benefit from energy efficiency improvements.
- Schools may not know where to start to create healthy, sustainable buildings. Established programs such as Leadership in Energy and Environmental Design (LEED) and the Collaborative for High Performance Schools can provide guidance.

Success Stories

- Kentucky used money from the 2009 American Recovery and Reinvestment Act (ARRA) to create a program that helped improve energy efficiency efforts in schools. As a result, Kentucky was home to the first net-zero K-12 school in the country, and remains among the states with the greatest number of net-zero schools.
- Discovery Elementary School in Arlington, VA is a net-zero energy school that saves $117,000 annually in utility costs compared to a typical elementary school of the same size in the district. This is enough to cover the salaries of two starting teachers.

Photos by Allison Shelley for American Education: Images of Teachers and Students in Action.

OUT-OF-SCHOOL ENVIRONMENTAL LEARNING

Out-of-school time (OST) programs provide students with opportunities to learn and pursue their interests through community-based programs during afterschool hours, over the summer, or through informal learning in spaces such as museums. Including outdoor education and learning about the environment in OST programs addresses climate change by expanding students' opportunities to learn about sustainability and their local environment.

Benefits

- Provides opportunities for students to develop and follow their own interests outside of school increasing their engagement and learning.
- Supports youth in learning about their local environment and culture while increasing connections to the community.

Addressing Barriers

- Limited green spaces or other safe outdoor spaces can be a challenge for outdoor education. Partnerships between community-based organizations and local parks departments can improve access.

Success Stories

- The Fresh Tracks program supports youth of color, opportunity youth, and Indigenous youth in becoming leaders for equity and environmental justice in their communities by using nature and cultures to bridge divides.
- The Girl Scout Tree Promise initiative challenges Girl Scout troops to plant five million trees across the country in five years in order to preserve forests and reduce climate change.
- National 4-H provides opportunities for youth to learn about the environment, agriculture, and health through youth leadership opportunities in their communities, including through a middle school curriculum on sustainability and climate change.

PLANS FOR SUDDEN ENROLLMENT CHANGES

Climate impacts such as hurricanes, wildfires, and severe flooding can cause families to move to different areas to regain stability in the face of loss. As families migrate within the U.S. and arrive from abroad, schools and districts may see upticks in enrollment in the middle of the year. Creating plans for enrollment changes helps districts adapt to extreme weather and become more resilient to climate impacts.

Benefits

- Supports the mental health of arriving students who may have experienced trauma associated with extreme weather by having plans to evaluate students and provide needed services.
- Supports the academic success of arriving students who may have had significant disruptions in schooling due to extreme weather by having plans to integrate students into the district and evaluate them for any needed services.

Addressing Barriers

- Capacity constraints can be a barrier to creating plans for enrollment changes. Districts can create partnerships with community-based organizations and other nearby districts to increase capacity when needed.

Success Stories

- Miami-Dade County Public Schools has plans to serve incoming students in three different scenarios, depending on the rate of new student arrivals — accepting students at all schools, setting up one to three registration centers, or establishing new full-service schools to serve newly-arrived students. Each plan is designed to meet students' academic, physical health, mental health, and social emotional needs.

POWER PURCHASE AGREEMENTS

Power purchase agreements (PPAs) allow third party developers to install and maintain solar panels at a school site with the school buying the solar power generated by the panels at a fixed cost for a number of years. PPAs enable schools to use solar energy for little or no additional cost.

Benefits

- Allows districts to benefit from solar panels without needing to purchase, install, or maintain them.
- Saves schools money on energy costs because the cost of solar energy is generally cheaper than traditional energy sources and can remain the same throughout the term of the agreement (e.g. 20 years).

Addressing Barriers

- Laws on PPAs differ by state, and in some instances may prevent schools from using PPAs. Advocating for changes to PPA laws, where applicable, can help more schools benefit from PPAs.

Success Stories

- In Arizona, Tucson Unified School District uses solar power at 80 schools and is expected to save $43 million in energy costs over 20 years. Through a power purchase agreement, the district paid no upfront costs and will purchase the energy generated by the solar panels at a fixed rate for 20 years.

REVOLVING LOAN FUNDS

Revolving loan funds can help support clean energy projects which save money over time. As one project repays the loan with the energy costs saved, a loan is then given to the next project. This structure enables a smaller upfront fund to be continually used to support additional clean energy projects.

Benefits

- Increases access to clean energy for schools or districts that may face challenges raising capital funds.
- Enables a single funding source to support multiple schools or districts in transitioning to clean energy.

Addressing Barriers

- Acquiring initial funding for a revolving loan fund can be a barrier. Partnering with businesses and government agencies can help raise initial funds.

Success Stories

- Maine established a School Revolving Renovation Fund in 1998 to help schools address health and safety concerns and improve energy and water conservation in school buildings.

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SCHOOL GARDENS

School gardens are used to grow produce at school which can be used by students and families. School gardens provide students with local food and can help students learn about sustainable food systems.

Benefits

- Provides hands-on opportunities for students to learn about the environment, sustainability, and growing food across all grades and across the curriculum.
- Can expose students and families to different types of produce and new ways of cooking.

Addressing Barriers

- Maintaining school gardens over time can be a potential barrier. Partnerships with community-based organizations can help provide funding, capacity, and expertise.

Success Stories

- In California, Oakland Unified School District has a goal of establishing a garden at every school. The district has a policy outlining the role of building and grounds staff in maintaining school gardens and a ready-to-use memorandum of understanding form for schools whose garden education is provided by outside organizations.

SOLAR POWER FOR SCHOOLS

Solar power converts sunlight into clean, renewable energy through solar panels that can be installed across school campuses — on roofs, over parking areas, or on the ground. By relying on clean, renewable energy, solar power reduces greenhouse gas emissions for schools.

Benefits

- Using solar power provides schools with clean energy and saves schools money on energy costs and operations.
- Installing solar panels creates opportunities for students across grade levels to learn about clean energy and solar power.

Addressing Barriers

- Upfront costs to install solar panels are a potential barrier. Power purchase agreements (PPAs) let districts purchase solar energy from a third party, which can reduce or eliminate costs for districts.
- Some school sites may not be compatible with solar panels due to roof integrity, size, or other constraints. Districts can still reduce fossil fuel use and energy costs by installing solar panels on schools that are compatible.

Success Stories

- In Arkansas, Batesville School District worked with teachers to reduce energy consumption and installed solar panels on two schools. The combined 1,483 solar panels generate half of the district's energy needs and save the district $100,000 per year in energy costs. Teachers also received training on how to incorporate solar technology into STEM classes.

Photo by Allison Shelley for American Education: Images of Teachers and Students in Action.

STUDENT MENTAL HEALTH SUPPORT

Extreme weather events often damage schools, homes, and other buildings in a community and cause many students and their families to experience homelessness, food insecurity, and other losses. Supporting student mental health helps students recover from extreme weather events and build their resilience to climate impacts.

Benefits

- Helps students manage their responses to traumatic events like hurricanes, wildfires, and other extreme weather.
- Addressing students' mental health needs can help students and educators continue with teaching and learning in the aftermath of community-wide trauma.
- Develops students' ability to be resilient in the face of climate impacts and other sources of trauma.

Addressing Barriers

- Staff capacity can be a barrier. Establishing partnerships with community-based organizations and nearby school districts can increase capacity in the event of community-wide trauma.
- Lack of training for non-mental health staff in schools. Professional development on trauma-informed practices and mental health support can help educators and other school staff appropriately respond to students' needs.

Success Stories

- After Hurricane Maria, the Puerto Rico Department of Education worked with the non-profit Pure Edge to train educators and school mental health professionals on supporting students who have experienced trauma.

SUSTAINABILITY DIRECTOR

A sustainability director for a school district can help manage and coordinate the district's efforts to improve sustainability in facilities and operations and the district's climate mitigation efforts.

Benefits

- Providing leadership and support for schools and districts in reducing their environmental footprints.
- Supports energy efficiency education for students, educators, and staff.

Addressing Barriers

- Funding can be a barrier to hiring a sustainability director. Searching for funding opportunities and realizing the potential for savings from lower energy costs as a result of this position can help.

Success Stories

- In Texas, Austin Independent School District has a sustainability manager who implements and tracks programs designed to improve sustainability and reduce costs by addressing energy use, water conservation, food use, and sustainable transportation, among other issues.
- Denver Public Schools has a sustainability team that includes a sustainability director, project and energy efficiency specialist, and school garden program specialist, among other positions. The sustainability team works with students and educators to conserve energy and water and reduce waste.
- The Center for Green Schools at the US Green Building Council runs the School Sustainability Leaders Network which provides fellowships, support, and learning opportunities for school or district staff whose roles include a focus on sustainability efforts.

TEACHER PREPARATION ON CLIMATE CHANGE AND SUSTAINABILITY

Teacher preparation programs educate future teachers before they enter the workforce. These programs include a range of requirements which differ by state and are aligned to teacher certification and licensure. Teacher preparation programs that include climate change and sustainability can help ensure that new teachers have the knowledge and skills they need to teach about climate change.

Benefits

- Increases teacher knowledge of climate change and how it can be incorporated across the curriculum and across all grades.
- Improves educators' comfort with teaching about climate change and sustainability from the beginning of their careers.

Addressing Barriers

- Building the capacity of teacher preparation programs to integrate climate change and sustainability can be a barrier. Identifying opportunities to partner with sustainability schools or existing programs with climate change education expertise can increase capacity for teacher preparation programs.

Success Stories

- The Center for Sustainable Futures at Teachers College, Columbia University supports several courses related to teaching about sustainability and the environment for students in education-related graduate programs. The center also provides professional development programs for in-service teachers.

VIRTUAL LEARNING PLANS

Plans for virtual learning allow schools to more easily continue teaching and learning even during extreme weather conditions and help schools be more resilient when extreme weather forces school buildings to close.

Benefits

- Supports academic continuity when schools must close due to climate impacts or other emergencies.

Addressing Barriers

- Access to the internet and digital devices at home can be a barrier to virtual learning. Schools can work with local governments, businesses, and community-based organizations to promote existing programs that affordably expand access to the internet and devices.
- Educator and parent/caregiver comfort with online platforms and digital devices can be a barrier to supporting virtual learning. Providing resources and training to educators and parents/caregivers can help increase support.

Success Stories

- Many districts have developed robust virtual learning plans as a result of the pandemic, including options that allow a return to virtual or hybrid learning when needed. In Ohio, Cleveland Metropolitan School District partnered with a local non-profit to distribute 17,000 digital devices to students and install thousands of hotspots in the community at a reduced cost.

Photo by Allison Shelley for American Education: Images of Teachers and Students in Action.