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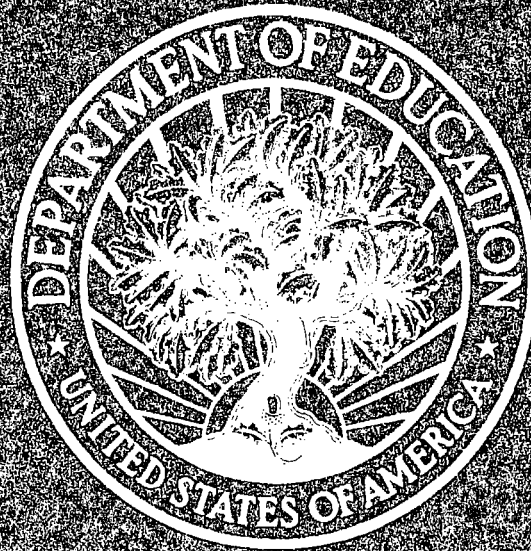
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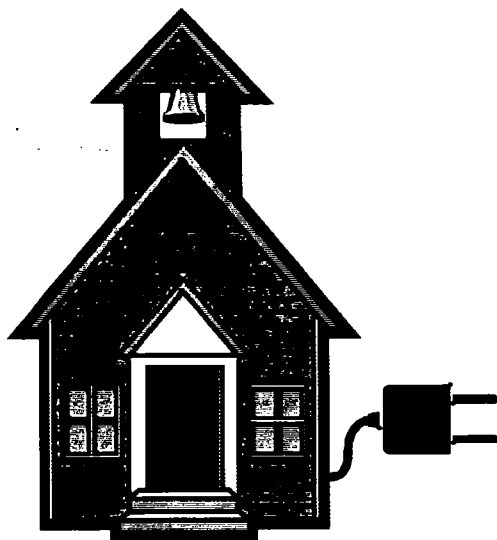
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DEPARTMENT OF EDUCATION

FY 2001
Budget Summary



EnergySmart Schools



Dan Reicher

Assistant Secretary

Office of Energy Efficiency and Renewable Energy

February 15, 2000



A Campaign of Rebuild America
U.S. Department of Energy

State of Our Schools

- Over 110,000 K-12 schools
 - 74% built prior to 1960
- Over \$6 billion/year energy costs
- Construction: 6000+ new schools needed
- Renovation: Over \$116 billion in repair
- Schools as centers of communities
 - Need to accommodate expanded use patterns and serve other functions



A Campaign of Rebuild America
U.S. Department of Energy

Benefits

- Potential Energy Cost Savings
 - \$1.5 billion/year for “Books not BTUs”
- Environmental Benefits
 - Potentially over 3.5 million metric tons of global warming gases displaced/year
- Improve Classroom Environment & Productivity
 - Daylighting
 - Temperature control
 - Indoor air quality



A Campaign of Rebuild America
U.S. Department of Energy

Perfect Platform for Clean Energy

- Lighting
- Windows
- HVAC systems
- Insulation
- Controls/Automation
- Roofing
- Solar technologies
- Ground source heat pumps
- Micro turbines
- Fuel cells
- Transportation technologies



A Campaign of Rebuild America
U.S. Department of Energy

Challenges

- Institutional
- Design
- Financing
- Legislation/Regulation



A Campaign of Rebuild America
U.S. Department of Energy

EnergySmart Schools

VISION...

...A national partnership to cut energy bills in schools and reinvest the savings in educating the nation's most valuable resource...*our children.*

EnergySmart Schools Partnership

Federal
Government

Utilities

State
Government

Finance
& ESCOs

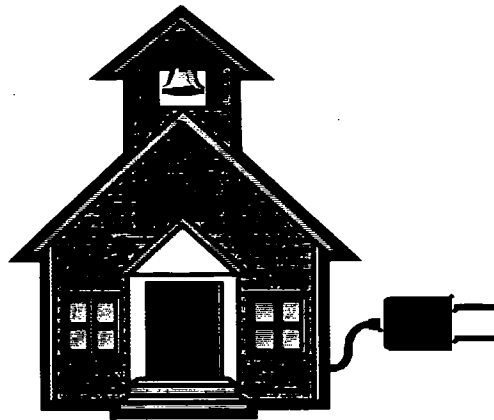
Equipment
Manufacturers

Unions

Local
Governments &
School Districts

Architectural,
Engineering,
and
Construction
Industry

Non-Profits &
Associations





A Campaign of Rebuild America
U.S. Department of Energy

10 Point Action Plan

- Pursue quantitative goals
- Remove institutional, legal and other barriers
- Develop financial, procurement, and design tools
- Provide technical assistance and training
- Demonstrate advanced technologies
- Demonstrate impacts of building design on learning and health
- Develop energy curricula
- Disseminate information
- Recognize success
- Track progress through partner meetings



A Campaign of Rebuild America
U.S. Department of Energy

Federal Efforts

- Department of Energy
 - Rebuild America Program
 - Million Solar Roofs
 - State Energy Program (Grants)
 - Clean Cities (alternative-fuel buses)
 - Federal Energy Management Program (FEMP)
- Environmental Protection Agency
 - ENERGY STAR®
 - Indoor air quality
- Health and Human Services
 - Head Start building rehab
- Department of Interior
 - Bureau of Indian Affairs Schools
- Department of Education
 - School design/modernization
 - National Clearinghouse on Educational Facilities
 - Center of Communities



A Campaign of Rebuild America
U.S. Department of Energy

Policy Options

- Executive Order
 - Creates Interagency Council co-chaired by Depts. of Education and Energy, in cooperation with EPA and other Federal agencies with schools (BIA and HHS).
 - Council coordinates Federal activities to promote energy efficiency, environmental quality, and enhanced learning facilities in schools that are the center of communities.
 - Establishes national goal of 25% reduction in energy use and 3.5mmt/year carbon savings by 2010.



A Campaign of Rebuild America
U.S. Department of Energy

Policy Options

Federal Legislation

- School Construction Legislation
 - 5 Bills in Congress
 - Bricks and mortar, no energy efficiency
- High Performance Schools Legislation
 - Udall bill promotes design & technical assistance for energy efficient school construction/renovation
 - Others?



A Campaign of Rebuild America
U.S. Department of Energy

Policy Options

- Energy Efficiency & Renewable Energy Sectors
 - Rebuild America Program
 - Clean Cities (alternative fuel buses)
 - Million Solar Roofs
- BIA/FEMP Schools
 - Design, retrofit
- R&D
 - Platform for applying Clean Energy technologies
- Regulation
 - Building Codes
- State Energy Program

Subject: Key Points for ENERGYSMART SCHOOLS Executive Order

Background

- The United States has over 112,000 K-12 Schools (Public/Private). Over 70% were built before 1960. Estimated \$150 billion in deferred maintenance and repair does not address modernization. An additional 6,000 schools need to be built by 2006 to accommodate student enrollments.
- Primary goal of EnergySmart Schools is to reduce \$6 billion annual energy expenditures in K-12 schools by 25% by 2010, realizing potential savings of \$1.5 billion per year. This is enough to buy 40 million new text books or 1.5 million computers or hire 30,000 new teachers.
- Annual savings in school buildings equal: energy savings of 0.225 quad; carbon savings of 3.52 mmt; .031 mmt NO_x savings; .062 mmt SO₂. The estimates for alternative fuel buses, assuming 10% conversion is: carbon savings of 0.05 mmt; .006 mmt NO_x savings.
- EnergySmart Schools announced in 1998 by Secretary Richardson and Department of Education Secretary Riley. Since then, Dept of Energy has assisted over 180 school districts; design assistance provided to 50 schools on geothermal heating/cooling. State Energy Offices have been awarded \$2.1 million for school projects.
- In Dept of Energy, EERE Building Technology, State and Community Office will manage EnergySmart Schools beginning in FY2000. This will result in integrated customer delivery of products and services, to include: Million Solar Roofs photovoltaic cell deployment and Clean Cities alternative fuel buses, together with school construction and modernization design guideline assistance, modular classroom criteria, and strategic partnership assistance.

Opportunities and Issues

- Establishes a national goal of reducing annual energy expenditures for primary and secondary schools by 25% by 2010, freeing up to \$1.5 billion per year for application to improvement of education.
- Directs the Departments of Energy and Education, with support by the Environmental Protection Agency, to coordinate technical assistance to states and schools to further the achievement of the stated purposes of the order.
- Creates an Interagency Council, including the Departments of Energy and Education, Environmental Protection Agency, Office of Management and Budget, and other agencies that may have direct or indirect responsibilities (such as Defense and Interior) related to primary and secondary education construction, operation, and finance. The Council is directed to develop appropriate Federal guidance necessary to implement legislation supporting the creation of high performance schools, to encourage coordination of services, and to promote collaboration among the states in the furtherance of the goals of the Executive Order.
- Encourages a whole buildings approach to school design, construction, and renovation to achieve energy efficiency, environmental quality, and community livability outcomes in the learning environment.
- Encourages the use of the sustainable design features of schools as learning opportunities for students.

- Encourages the use of new school construction and renovation of schools as a research opportunity to advance and apply knowledge of how high performance school buildings enhance learning by students and teaching by teachers.
- Establishes a mechanism to reward and recognize successful efforts to integrate sustainable design and energy efficiency through awards, recognition and certification programs (e.g. Energy Star® labels).
- Encourages private sector energy services providers (ESCOs and utilities) to partner with schools to provide necessary financial resources, and technical and operational expertise vital to achieving the purposes of the Order.
- Directs the establishment of an interagency clearinghouse for information resources in support of the Executive Order, and to promote peer assistance activities by states and local school administrators.
- Directs development of model energy smart school legislation, for state use, providing legal changes needed to enable school administrations to construct and renovate schools based on life cycle cost-based sustainable design principles, and to allow access to private sector capital to finance energy efficiency retrofits and other changes essential to achieving the aims of the Executive Order.

Status of Legislation

- Currently there are five (5) significant legislative initiatives as follows:
 - S.2, **Education Opportunities Act**. Sponsor: Sen. James M Jeffords (R-VT). Bill reauthorizes Elementary and Secondary Education Act of 1965 (20 U.S.C. 6301 et seq.) through fiscal year 2004. Introduced 1/19/1999 and is currently scheduled for hearings before the Senate Committee on Health, Education, Labor and Pensions (HELP), chaired by Sen. Jeffords. Senator Jeff Bingaman (D-NM) is a member on HELP and also chairs the Alliance to Save Energy. Bill has seven (7) cosponsors, including Sen John McCain.
 - H.R.3143, **High Performance Schools Act of 1999**. Sponsor: Rep. Mark Udall (D-CO). Bill creates the High Performance Schools Program in the Department of Education to help school districts build K-12 schools that are "healthful, productive, energy efficient, and environmentally-sound." This program begins with annual funding of \$200M in FY2001 and totals \$860M through FY2004. Grants are intended for use in the design process, to study the effect of a high performance learning environment, and facilitate private funding. The bill, introduced 10/25/1999, has been referred to the Committee on Education and the Workforce (chaired by William Goodling, R-PA) and has three (3) cosponsors, recently adding Sherwood "Sherry" Boelert (R-NY).
 - S.1454, **Public School Modernization and Overcrowding Relief Act of 1999**. Sponsor: Sen. Charles S. Robb (D-VA). Bill amends Internal Revenue Code to expand incentives for construction and renovation of public schools and provides tax incentives for corporations to participate in cooperative agreements with public schools in distressed areas. Bill introduced 7/28/1999 and was referred to Committee on Finance. Bill has 21 cosponsors, including Sen Tom Daschle.
 - H.R.1660, **Public School Modernization Act of 1999**. Sponsor: Rep. Charles B. Rangel (D-NY). Bill amends the Internal Revenue Code to expand incentives for the construction and renovation of public schools and provide tax incentives for corporations to participate in cooperative agreements with public schools in distressed areas. Bill was introduced 5/4/1999 and has been referred to House subcommittees under Education and the Workforce. This bill has 203 cosponsors.

— H.R.1760, **America's Better Classrooms Act of 1999**. Sponsor: Rep. Nancy L. Johnson (R-CT) also amends the Internal Revenue Code to expand incentives for construction, repair, rehabilitation, and renovation of public schools. This bill was introduced about the same time as H.R.1660 (5/11/1999) and has also been referred to House subcommittees. Bill has 51 cosponsors.

- Of the above, H.R.3143 is the most current, and articulates the approach favored by the Alliance to Save Energy; (i.e. funding of high performance K-12 school designs). The current activity in S.2 may present an opportunity to consider H.R.3143 concepts.
- In December 1999, Staffers Shirley Neff and Dan Alpert from Sen. Bingaman's office were briefed on the EnergySmart Schools program by the Dept of Energy.
- Last year, Congress did not approve the Administration's proposal to use \$3.7B in tax credits over five (5) years to help local governments issue \$25B in bonds. These figures are the same as those stated by the American Institute of Architects as the approximate cost of S.1454, H.R.1660 and H.R.1760.
- Recently, in January 2000, President Clinton proposed \$1.3B appropriation for school construction. This is included in the FY2001 Department of Education budget submission.



EnergySmart Schools

America's schools spend more than \$6 billion each year on energy. The U.S. Department of Energy (DOE) estimates they could save 25 percent of that money—\$1.5 billion nationally—through better building design, widely available energy technologies, renewable energy use, and improvements to operations and maintenance.

Schools that are smart about energy in their buildings, buses, and classrooms not only save money but reap a host of other benefits:

- ▶ Their classrooms are more conducive to learning, with better lighting, better temperature control, and less outside noise;
- ▶ Schools have more funds for teachers, computers, and other educational resources—not just today but for years to come;
- ▶ Their buses emit fewer dangerous pollutants, particularly into areas where children learn and play;
- ▶ Schools spend less time—thus fewer resources—maintaining and operating buildings and buses;
- ▶ By teaching about energy, schools create a generation of students who understand the math, science, and environmental impacts of energy use, and carry that into the future—our future.

Schools need help—we provide it

The EnergySmart Schools campaign is designed to motivate schools to use energy wisely, and help them do it.

Schools get training workshops, publications, recognition, and access to a broad network of private and public sector partners for help. On the local level, they can join or create community partnerships to benefit from even broader assistance—direct technical support and financing programs, among others.

Behind the scenes, the campaign works with legislators and policy-makers to develop incentives for energy improvements. We're also developing energy design guidelines to help schools be smart from the start, encouraging businesses to provide more school products and services, and working to eliminate policies and regulations that are barriers to school energy improvements.

Finally, the campaign creates and locates teaching materials so that tomorrow's decision-makers build better buildings, use renewable energy technologies, design better buses, and continue to be smart about energy.

Coordinating With Other Programs

The EnergySmart Schools campaign is operated by Rebuild America, in DOE's Office of Building Technology, State and Community Programs. The campaign shares information and resources with other DOE programs affecting schools: Clean Cities, which focuses on alternatively fueled buses; the President's Million Solar Roofs Initiative, aimed at increasing use of solar technologies; the State Energy Program, a DOE grant program administered through state energy offices; and ENERGY STAR®, a joint DOE/EPA program focused on improving energy performance in buildings.

Give Help—Get Involved

Businesses and organizations can join DOE in helping America's schools. They can participate in the EnergySmart Schools campaign through Rebuild America.

Our partners offer services and products ranging from workshops and publications to design and construction. In some cases, they provide school services such as building audits at no or low cost.

- ▶ Businesses can participate by becoming Business Partners. Contact Amy Tilton at atilton@aspensys.com.
- ▶ Local businesses and organizations can join or create community partnerships that include schools. To find a local partnership or obtain guidance for creating one, call DOE's hotline at 1-800-DOE-3732.
- ▶ National associations or government agencies can join as Strategic Partners. Contact Norma Dulin, ndulin@erols.com.

Students, teachers, and parents can also play an important role: they can encourage school administrators to design and renovate for energy efficiency, use renewable energy technologies, operate and maintain their buildings and buses efficiently, and use alternatively fueled buses.

Get Help—Get EnergySmart

Schools and school districts can tap a wealth of resources through the EnergySmart Schools campaign.

The EnergySmart Schools Web Site

Our web site provides specific guidance for building renovation and design, plus information about alternatively fueled buses. It also lists resources for teaching and learning about energy including the downloadable "Saving Energy Starts With Me" activities. The address is:

www.eren.doe.gov/energysmartschools

Rebuild America Community Partnerships

DOE's Rebuild America program helps schools and other building owners create local partnerships to plan and implement energy efficient, cost-saving building improvements. Go to the Rebuild America web site at www.eren.doe.gov/buildings/rebuild. To have your local Rebuild America representative contact you call 1-800-DOE-3732.

The Energy Efficiency and Renewable Energy Clearinghouse (EREC)

DOE created this hotline to answer specific questions about energy improvements and guide you to resources for help. Call 1-800-DOE-3732 or send an email to Don Fort at dfort@nciinc.





Trends Affecting School Energy Consumption

Rising enrollment is perhaps the most significant trend affecting school energy consumption nationally. The U.S. Department of Education estimates that the number of school-age children will be 54 million by 2007, a 1.5 million increase over 1998.

Districts across the country are renovating, constructing additional classrooms, and building entirely new schools to accommodate this increased demand. In fact, at least 3,000 new schools are expected to be constructed by 2007. If inefficient, these new and renovated schools will spend precious school resources—and taxpayer dollars—on high energy bills for years to come. If efficient, the next generation of schools will have more resources for educating children.

Other trends affecting school energy consumption are directly related to new educational approaches. Unless energy efficiency is addressed hand-in-hand with these approaches, schools will spend even greater sums on energy and have less for books and other educational resources. Now is the time to make schools smart about energy.

Expanded school hours

Districts across the country are embracing the concept of “Schools as Centers of Community,” hosting more non-student events and integrating more public facilities. The longer schools operate during the day, the more energy they use and the higher their energy bills.

The "house" or "cluster" concept

To provide a smaller school atmosphere, many large schools are grouping subsets of students into specific areas of buildings. These clusters often have their own facilities such as laboratories for science, computers, or foreign language instruction. Cluster-based schools often have more specialty classrooms, requiring larger schools and duplicate spaces to accommodate the same number of students. Larger schools require larger heating and cooling systems and other equipment, and have more windows, doors, and walls where air and noise can leak.

Shared resources

Some new schools are designed so that gymnasiums, cafeterias, libraries and other areas are shared among grades or even schools. This allows for more efficient use of space, lower energy bills, and lower construction costs.

Year-round classes

Schools that adopt year-round schedules are in use 15 to 30 percent more than schools with full summer breaks. In addition to expanding the time energy systems are in use, year-round schools operate during hot summer months when cooling bills can skyrocket.

More individual instruction

One-on-one instruction requires private areas where the teacher and student can interact undisturbed, often in private rooms. Schools providing such instruction must have more space to accommodate the same number of students.

Computer-based education

Each computer station in a classroom reduces its capacity by one to one-and-a-half students. This means that schools must be larger to serve the same number of students. Printers, scanners and other computer devices also add to electricity consumption and increase utility bills.

Smaller class size

As schools strive to reduce student-teacher ratios, they typically add classrooms rather than moving walls within existing buildings. An expanded school can place more demands on energy systems. If the added classrooms are modular, energy consumption may increase even more, since the average modular classroom is far less efficient than a comparable permanent classroom.

Find out more at www.eren.doe.gov/energysmartschools



Myths About Energy In Schools

Myth: Energy isn't a major budget item for schools

Fact: In most school districts, energy costs are second only to salaries, exceeding the cost of supplies and books. Nationally, K-12 schools spend more than \$6 billion a year on energy, and a quarter of that could be reasonably saved through energy improvements.

Myth: Schools can't save much by being energy smart

Fact: Changes in behavior alone—such as turning off lights in unoccupied rooms and turning off computers at night and on weekends—can save an individual school thousands of dollars every year. Even vending machine lights can make a difference: the Seattle school district saved \$20,000 a year by turning off the lights in its 250 vending machines. Many other schools reap tremendous benefits by using energy efficient equipment and undertaking energy retrofits. By following a newly developed Christmas school shutdown protocol, the Idaho Falls School District saved about \$28,000 in energy costs over a ten-day period. In Tennessee, Washington County's Daniel Boone High School achieved a 34 percent reduction in annual energy costs since 1995 when it installed a geothermal heating and cooling system. Its savings have averaged \$82,000 annually.

Myth: Energy efficiency is not related to student performance

Fact: Evidence is growing that energy-efficient schools can provide learning environments that lead to improved student performance. In part, the link between smart energy use and improved learning is intuitive: students can't read the blackboard if lighting is inadequate; they can't hear teachers over noise through leaky windows or old heating systems; and they can't concentrate if they're roasting or freezing in classrooms with poor temperature control. In addition, studies by Pacific Gas & Electric Company and others have shown that daylighting—an integral part of most new energy-efficient schools—may have a positive effect on test scores.

Myth: Energy improvements require major upfront investment

Fact: Fortunately, financing options such as energy savings performance contracts and lease-purchase programs allow schools to make improvements with little or no investment. With performance contracts, an energy services company (ESCO) pays for the energy improvements, and is paid back over time through the utility bill savings the project creates. With lease-purchase programs, schools make payments each month and own the building or bus equipment at the end of the contract period. Also, some state energy offices have no-interest or low-interest loan programs to facilitate energy improvements.

Myth: New school buildings are energy efficient

Fact: New schools may be as inefficient as old ones unless a school directs its architect to design energy-efficient buildings. During the rush to construct new buildings and house additional students, schools may focus on short-term construction costs instead of long-term, life-cycle savings. Or, they may incorporate only minor energy efficiency measures. Well-designed schools are properly oriented on their site to take maximum advantage (or provide relief from) the sun. They use windows, walls, insulation, lighting systems, heating and cooling systems, and other elements that are efficient and well-integrated. And, they allow areas of the building to be shut-down when not in use, among other energy smart features.

Myth: Constructing an energy efficient school costs more

Fact: Total construction costs for energy efficient schools are often the same as costs for traditional schools even though individual building features may cost more. The reason is simple: efficient buildings leak less air and take better advantage of the local climate. Therefore, their heating and cooling systems—among the most expensive aspects of buildings—don't need to be as extensive to provide comfort. Even when design or construction costs are higher, energy savings can pay for additional upfront costs very quickly—sometimes in less than a year. A shining example is the Durant Middle School in Raleigh, North Carolina. Not only does this school save \$165,000 a year in energy costs, but it was constructed \$700,000 under budget.

Myth: Designing energy-efficient buildings takes more time

Fact: The design process for an energy efficient building is slightly different but not necessarily more time consuming. The process is less linear—design documents don't just go from architect to engineer to subcontractors, with each adding information at a specific stage. Instead, all of these professionals work closely together from the beginning to ensure that the building's systems are fully integrated with each other and with the structure. The key is to find an architect and engineer with experience and expertise in this type of design.

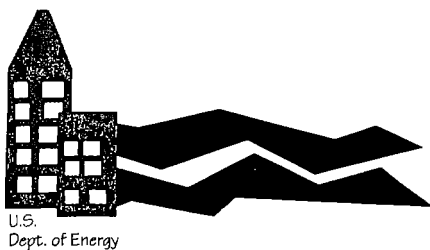
Myth: Deregulation of electricity utilities means schools don't have to worry about energy efficiency

Fact: Deregulation of electric utilities allows (or will allow) schools and other building owners to choose their electricity supplier, often based on rates. Those rates depend on many factors: the school's overall electricity demand, its pattern of electricity use throughout the day, and the predictability of its energy demand, among others. Schools that have sudden peaks in electricity demand due to inefficient equipment or operations are typically less attractive to utility companies so get higher rates. Also, schools that know how and when they use electricity will have valuable information in negotiating for the best rates.

Myth: Local communities won't support energy improvements

Fact: Energy smart design can be a selling point in bond elections: such schools not only offer their students greater comfort and opportunity for concentration, but use fewer taxpayer dollars to pay high energy bills.

Find out more at www.eren.doe.gov/energysmartschools



Buildings for
the 21st Century

Rebuild America

Rebuilding America — one community at a time

THE BENEFITS

Rebuild America strengthens communities by:

- Improving building performance
- Reducing energy use
- Saving money
- Creating jobs
- Promoting economic growth
- Protecting the environment

The Program

Each year nearly \$100 billion is spent on the energy used to run America's commercial buildings and multifamily housing units. Rebuild America is a voluntary network of community partnerships determined to reduce this energy cost by saving energy locally. Rebuild America partnerships, joining with the U.S. Department of Energy (DOE), improve the energy efficiency of their communities' buildings.

Working on a local level, Rebuild America helps community organizations access innovative technologies, industry services, customized assistance, and an array of business and technical tools. The program focuses on five building sectors: private commercial, State and local governments, K-12 schools, universities and colleges, and public and assisted housing.

The Approach

Rebuild America builds awareness among community leaders about the high price communities pay for inefficient buildings—and how wasted energy dollars can be redirected to pay for building improvements and other community needs. To help communities invest in their future by investing in energy efficiency, Rebuild America provides access to technical experts, training, guidance materials, and software; local and regional resources; peer exchange networks; and public recognition.

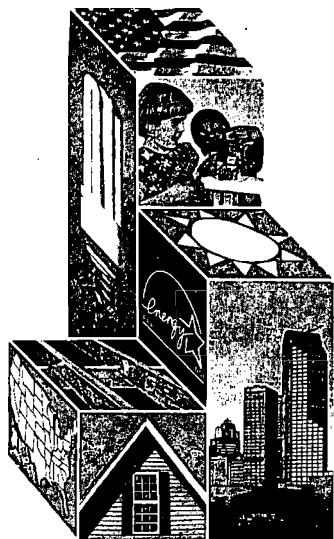
To join Rebuild America, a community organization initiates a partnership with local or State government, utilities, building owners, civic and environmental leaders, school administrators, nonprofits, and economic development organizations. Communities then have one year to set priorities for building improvements in an Action Plan. As a group, they choose target buildings, set goals for energy savings, look for ways to finance the projects, and decide how to coordinate and mobilize their efforts. Retrofit projects often focus on municipal buildings, college campuses, public schools, main street business districts, historic landmarks, and community housing.



*Rebuild America partners are transforming
the historic Woodland-Olney School
in Woodland, North Carolina, into
low-income housing for senior citizens.*



OFFICE OF BUILDING TECHNOLOGY, STATE AND COMMUNITY PROGRAMS
ENERGY EFFICIENCY AND RENEWABLE ENERGY • U.S. DEPARTMENT OF ENERGY



BUILDINGS FOR THE 21ST CENTURY

Buildings that are more energy-efficient, comfortable, and affordable . . . that's the goal of DOE's Office of Building Technology, State and Community Programs (BTS). To accelerate the development and wide application of energy efficiency measures, BTS:

- Conducts R&D on technologies and concepts for energy efficiency, working closely with the building industry and with manufacturers of materials, equipment, and appliances
- Promotes energy/money saving opportunities to both builders and buyers of homes and commercial buildings
- Works with State and local regulatory groups to improve building codes, appliance standards, and guidelines for efficient energy use
- Provides support and grants to States and communities for deployment of energy-efficient technologies and practices

The Results

By the year 2003, more than 250 communities will have committed to retrofit 2 billion square feet of floor space. These building improvements will save \$650 million in energy costs every year and reduce air pollution by 1.6 million tons of carbon dioxide annually.

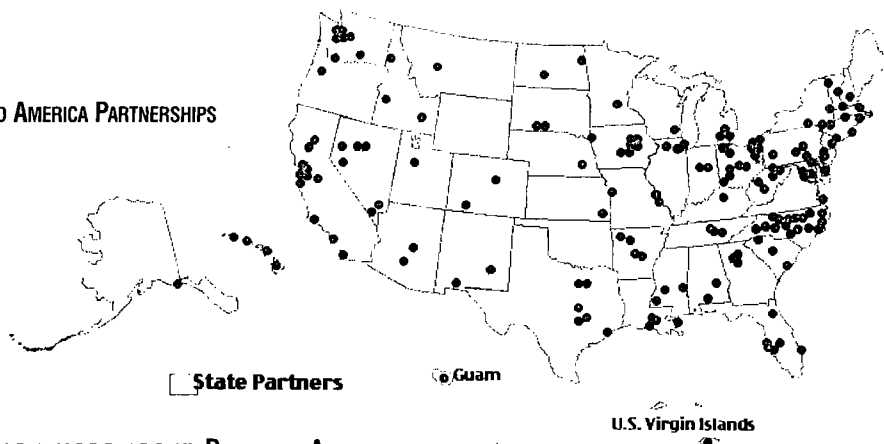
Since 1995, more than 200 partnerships have joined the effort. From rural Alaska to downtown Atlanta, communities nationwide are giving older buildings a new lease on life with innovative technology. Their renovation projects are helping business people, school districts, arts and culture organizations, and public agencies save 20 to 30 percent on their energy bills. This is money that can be put to work back in the community—buying computers for schools and books for libraries, revitalizing America's downtowns, and protecting the environment.

For example, Building Owners and Managers of Atlanta, Inc. (BOMA) has targeted 30 million square feet of commercial office and retail space for renovation. The Portland Energy Office has completed retrofits on 35.8 million

square feet, exceeding its target goals and using only 30 percent of the expected budget. Rebuild Idaho has audited 1 million square feet in the Idaho Falls School District and saved one school \$8,500 in 10 days during a vacation shutdown demonstration. Rebuild Webster City, Iowa, has retrofitted 20 buildings, including several schools, municipal buildings, churches, and private businesses by leveraging a small amount of Federal funding (less than \$50,000) into nearly \$5 million in energy efficiency improvements.

Partnerships are at work in 47 States, two U.S. territories, and several Native American tribes. Some partnerships have leveraged as much as \$25 million in private investment for their projects. They have also partnered with national financial institutions and Federal empowerment/enterprise zones, used municipal bond issues and revolving loan programs, and tapped commercial industry to fund projects. By 2003, Rebuild America communities will have generated \$3 billion in private community investment and created 26,000 new jobs.

REBUILD AMERICA PARTNERSHIPS



TO LEARN MORE ABOUT REBUILD AMERICA, CONTACT:

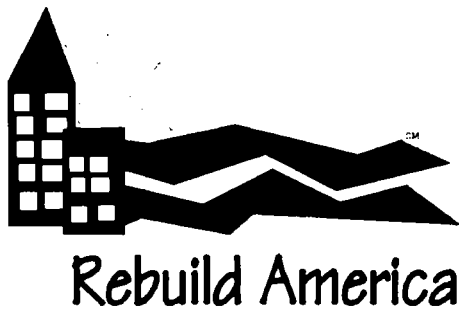
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Visit the Rebuild America Web site at: www.eren.doe.gov/buildings/rebuild
Or call the Energy Efficiency and Renewable Energy Clearinghouse at: 1-800-DOE-3732



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Rebuild America: A Summary Report of K-12 School Projects

February 2000

Rebuild America is a voluntary program of the U.S. Department of Energy that helps community partnerships make profitable investments in existing buildings through energy efficient technologies. By the Year 2003, Rebuild America partnerships will be involved in over 2 billion square feet of building renovations, which will save \$650 million every year in energy costs, generate \$3 billion in private community investment, create 26,000 new private sector jobs, and reduce greenhouse gases by 1.6 million tons of carbon dioxide a year. The program currently has over 250 partnerships. Through Rebuild America, DOE's *EnergySmart Schools* campaign promotes the improvement of the energy performance of both new and existing K-12 school buildings.

Please Note: *This report encompasses summary information for a number of Rebuild America partnerships actively pursuing school building improvements. The estimated data below represents the "committed" (that floorspace set as a retrofit goal in partnership action plans) or completed square footage for 37 of these partnerships. The data does not include the additional square footage and school districts "targeted" for the future by these 37 Rebuild partnerships or school projects planned by the other approximately 215 Rebuild America partnerships (data not yet available).*

SUMMARY OF ESTIMATED DATA:

Number of partnerships working with schools:	37
Total number of school buildings:	2,400
Total number of school districts:	183
Total square footage committed:	61,386,000 square feet



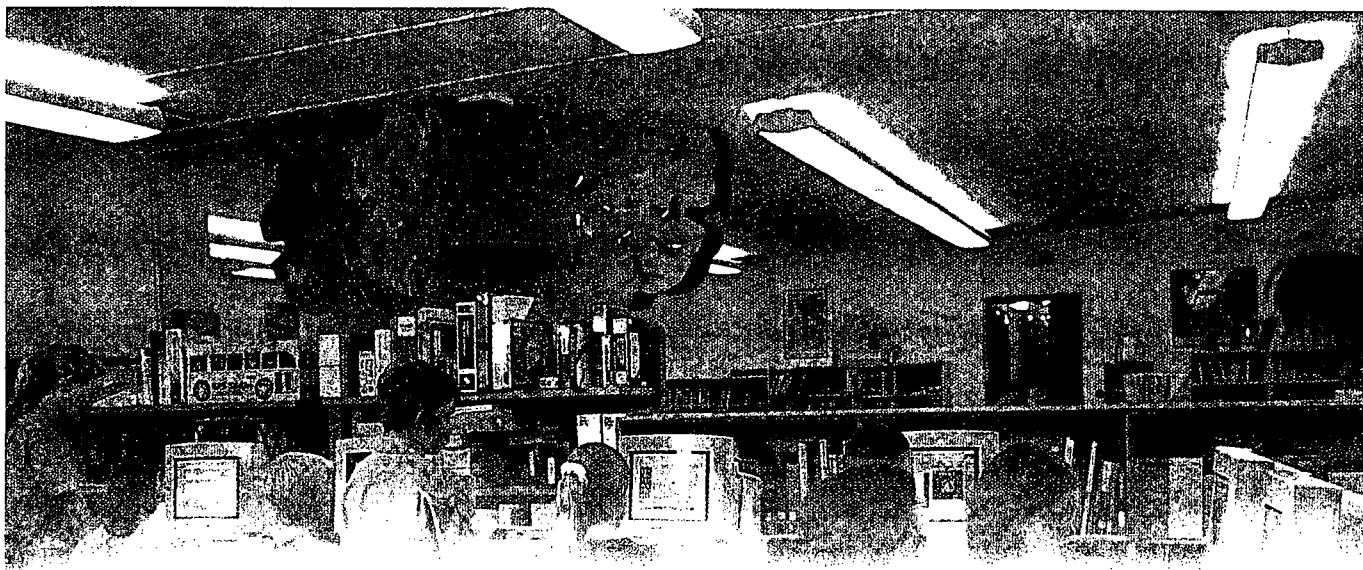
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BACK TO SCHOOL FOR ENERGY-WASTING BUILDINGS



BY DOUG HINRICH

FROM TEXAS TO ALASKA, our public schools are in bad physical shape and waste a lot of energy. In a 1995 nationwide survey of schools conducted by the U.S. General Accounting Office titled *School Facilities: Conditions of America's Schools*, nearly 50 percent of school officials reported at least one unsatisfactory environmental condition—such as poor heating, lighting,

ventilation or air quality. More than 40 percent gave their school an unsatisfactory energy-efficiency rating. The same survey put a number of over \$112 billion as the figure needed in repairs, renovations, and modernizations for the nation's public schools.

As repairs and energy retrofits are ordered and undertaken for school buildings, they can serve as valuable

examples from which to learn. Basic thermodynamics can help operations and maintenance managers learn how to better manage energy loads and insulate for energy savings. Rechanneling energy savings uses inductive reasoning, along with elementary math skills, to prove that money is better spent on classroom improvements or teacher pay raises than high utility bills.

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Partner Update

September – October 1999

Office of Energy Efficiency and Renewable Energy

Profile



Mel Goodwin

Harmony Project Strikes While Iron Is Hot

Mel Goodwin, Harmony Project executive director and leader of its Rebuild America partnership, is pulling out the stops to focus the Charleston, SC community's attention on the opportunity to transform schools that are in poor condition into "high performance schools" that are economical to operate and provide superior learning environments. Goodwin views the schools as "agents of change" and the gateway to improving other buildings in the Charleston area through Rebuild America.

When Goodwin, an urban ecologist, saw that Charleston County had no firm plan for allocating \$175 million in school bond funds, he wanted to avoid the result he feared most – a Band-Aid approach to patching up schools sorely in need of major improvement.

In an effort to head off this possibility, he launched a "High Performance Schools Initiative" and began talking to the media about the need to press the Charleston County School Board to rehabilitate its school buildings by adopting cost-effective, sustainable

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Rebuild America Helps Schools In Need

America's public schools are in trouble. With only 112,000 K-12 schools nationwide and over 25 school districts with over 100,000 students, there is growing pressure on financially strapped communities to do more with less. The stock of schools built during the baby boom that peaked in 1957, shrank in the late 1970s as enrollment thinned and school districts sold school buildings. Many that remain are vastly out of date today, inefficient and badly in need of repair—particularly in urban districts.

Building new schools is expensive. In the 1960s, a typical school could be built for under \$50 per square foot. The average is now twice that amount once the costs of inflation, building code compliance, and other costs are added. Despite higher costs, Maryland's Montgomery County School District is currently in the midst of a construction frenzy – about \$140 million worth — as builders work to create space for the enrollment boom. Still, many students will have to cram into 286 portable classrooms, or trailers, scattered throughout the county simply for lack of classrooms.

In response to this pressing national need, Rebuild America has opened up its 'tool chest' to offer building owners and managers information on how to save energy and dollars by making affordable improvements to school buildings.

Retrofits that Work

In rural Alaska, the local school is often the largest building in the community, which makes it well suited for demonstrating the benefits of energy-efficient retrofits. The high costs of transporting oil make for steep energy prices, as high as \$1 per kwh, prompting strong interest in energy conservation. **Rural Alaskans Conserve Energy**, a Rebuild America partnership, has audited a total of 21 buildings in seven villages and recommended energy conservation measures. Three of the seven villages have implemented those recommendations and have seen energy savings of 20-30 percent with cost recovery in less than two years.

The Tanana City School building is one example. With \$22,000 in state and school district funds, Alaska

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Smith Tackles the Rockies

Rebuild America's message to make buildings more energy efficient has found fertile soil in Rocky Mountain country. Under the capable leadership of Linda Smith, program



Linda Smith

manager with the Governor's Office of Energy Conservation, **Rebuild Colorado** has signed on 66 partners across the state, including school districts, colleges, cities, counties, hospitals and public housing complexes. Most joined within the last eight months.

Five state agencies that served as the program's "training ground" are saving the state \$8 million annually through performance contracting, which allows tomorrow's energy savings to pay for today's investments in efficient equipment.

What accounts for the enthusiastic response in Colorado? For starters, the message of improving facilities with no up-front expenditures resonates well among building managers. Then add the program's inclusive approach to attracting key players and its educational efforts to stimulate interest in performance contracting.

"Our hallmark is to offer free on-site, hands-on assistance," Smith says. "When we visit a school district we try to meet with the facilities manager,

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Making Schools "Energy Smart"

By Dan Reicher

As a new school year begins, administrators, parents, teachers and kids face the severe infrastructure problems in America's school buildings.

Consider some revealing statistics:

- the U.S. General Accounting Office reports a \$112 billion national backlog of needed school maintenance and repair exists;

- one-third of all schools report at least one building in need of extensive repair or replacement; and

- according to the American Association of School Administrators, 74 percent of schools were built prior to 1960.

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Native American Tribes Are Saving Energy, Money

With the deregulation of the electric industry, Native American leaders are stepping up their efforts to address the high cost of energy, the demand for cleaner energy and the need for energy education in their communities. They're finding some solutions through Rebuild America.

The **Rosebud Sioux** of Rosebud, South Dakota, was the first Native American tribe to form a Rebuild America partnership, followed by the neighboring **Lower Brule Sioux**.



Dan Reicher (left) accepted a traditional Lakota star quilt on behalf of DOE from Rose Cordier.

Rebuild America program representatives Doug Avery and Dave Waltzman have also met with the Navajo, Yavapai Apache and Standing

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FEDS SOFTWARE VERSION

Subject: Key Points for ENERGYSMART SCHOOLS Executive Order

Background

- The United States has over 112,000 K-12 Schools (Public/Private). Over 70% were built before 1960. Estimated \$150 billion in deferred maintenance and repair does not address modernization. An additional 6,000 schools need to be built by 2006 to accommodate student enrollments.
- Primary goal of EnergySmart Schools is to reduce \$6 billion annual energy expenditures in K-12 schools by 25% by 2010, realizing potential savings of \$1.5 billion per year. This is enough to buy 40 million new text books or 1.5 million computers or hire 30,000 new teachers.
- Annual savings in school buildings equal: energy savings of 0.225 quad; carbon savings of 3.52 mmt; .031 mmt NO_x savings; .062 mmt SO₂. The estimates for alternative fuel buses, assuming 10% conversion is: carbon savings of 0.05 mmt; .006 mmt NO_x savings.
- EnergySmart Schools announced in 1998 by Secretary Richardson and Department of Education Secretary Riley. Since then, Dept of Energy has assisted over 180 school districts; design assistance provided to 50 schools on geothermal heating/cooling. State Energy Offices have been awarded \$2.1 million for school projects.
- In Dept of Energy, EERE Building Technology, State and Community Office will manage EnergySmart Schools beginning in FY2000. This will result in integrated customer delivery of products and services, to include: Million Solar Roofs photovoltaic cell deployment and Clean Cities alternative fuel buses, together with school construction and modernization design guideline assistance, modular classroom criteria, and strategic partnership assistance.

Opportunities and Issues

- Establishes a national goal of reducing annual energy expenditures for primary and secondary schools by 25% by 2010, freeing up to \$1.5 billion per year for application to improvement of education.
- Directs the Departments of Energy and Education, with support by the Environmental Protection Agency, to coordinate technical assistance to states and schools to further the achievement of the stated purposes of the order.
- Creates an Interagency Council, including the Departments of Energy and Education, Environmental Protection Agency, Office of Management and Budget, and other agencies that may have direct or indirect responsibilities (such as Defense and Interior) related to primary and secondary education construction, operation, and finance. The Council is directed to develop appropriate Federal guidance necessary to implement legislation supporting the creation of high performance schools, to encourage coordination of services, and to promote collaboration among the states in the furtherance of the goals of the Executive Order.
- Encourages a whole buildings approach to school design, construction, and renovation to achieve energy efficiency, environmental quality, and community livability outcomes in the learning environment.
- Encourages the use of the sustainable design features of schools as learning opportunities for students.

- Encourages the use of new school construction and renovation of schools as a research opportunity to advance and apply knowledge of how high performance school buildings enhance learning by students and teaching by teachers.
- Establishes a mechanism to reward and recognize successful efforts to integrate sustainable design and energy efficiency through awards, recognition and certification programs (e.g. Energy Star® labels).
- Encourages private sector energy services providers (ESCOs and utilities) to partner with schools to provide necessary financial resources, and technical and operational expertise vital to achieving the purposes of the Order.
- Directs the establishment of an interagency clearinghouse for information resources in support of the Executive Order, and to promote peer assistance activities by states and local school administrators.
- Directs development of model energy smart school legislation, for state use, providing legal changes needed to enable school administrations to construct and renovate schools based on life cycle cost-based sustainable design principles, and to allow access to private sector capital to finance energy efficiency retrofits and other changes essential to achieving the aims of the Executive Order.

Status of Legislation

- Currently there are five (5) significant legislative initiatives as follows:
 - S.2, **Education Opportunities Act**. Sponsor: Sen. James M Jeffords (R-VT). Bill reauthorizes Elementary and Secondary Education Act of 1965 (20 U.S.C. 6301 et seq.) through fiscal year 2004. Introduced 1/19/1999 and is currently scheduled for hearings before the Senate Committee on Health, Education, Labor and Pensions (HELP), chaired by Sen. Jeffords. Senator Jeff Bingaman (D-NM) is a member on HELP and also chairs the Alliance to Save Energy. Bill has seven (7) cosponsors, including Sen John McCain.
 - H.R.3143, **High Performance Schools Act of 1999**. Sponsor: Rep. Mark Udall (D-CO). Bill creates the High Performance Schools Program in the Department of Education to help school districts build K-12 schools that are "healthful, productive, energy efficient, and environmentally-sound." This program begins with annual funding of \$200M in FY2001 and totals \$860M through FY2004. Grants are intended for use in the design process, to study the effect of a high performance learning environment, and facilitate private funding. The bill, introduced 10/25/1999, has been referred to the Committee on Education and the Workforce (chaired by William Goodling, R-PA) and has three (3) cosponsors, recently adding Sherwood "Sherry" Boelert (R-NY).
 - S.1454, **Public School Modernization and Overcrowding Relief Act of 1999**. Sponsor: Sen. Charles S. Robb (D-VA). Bill amends Internal Revenue Code to expand incentives for construction and renovation of public schools and provides tax incentives for corporations to participate in cooperative agreements with public schools in distressed areas. Bill introduced 7/28/1999 and was referred to Committee on Finance. Bill has 21 cosponsors, including Sen Tom Daschle.
 - H.R.1660, **Public School Modernization Act of 1999**. Sponsor: Rep. Charles B. Rangel (D-NY). Bill amends the Internal Revenue Code to expand incentives for the construction and renovation of public schools and provide tax incentives for corporations to participate in cooperative agreements with public schools in distressed areas. Bill was introduced 5/4/1999 and has been referred to House subcommittees under Education and the Workforce. This bill has 203 cosponsors.

— H.R.1760, **America's Better Classrooms Act of 1999**. Sponsor: Rep. Nancy L. Johnson (R-CT) also amends the Internal Revenue Code to expand incentives for construction, repair, rehabilitation, and renovation of public schools. This bill was introduced about the same time as H.R.1660 (5/11/1999) and has also been referred to House subcommittees. Bill has 51 cosponsors.

- Of the above, H.R.3143 is the most current, and articulates the approach favored by the Alliance to Save Energy; (i.e. funding of high performance K-12 school designs). The current activity in S.2 may present an opportunity to consider H.R.3143 concepts.
- In December 1999, Staffers Shirley Neff and Dan Alpert from Sen. Bingaman's office were briefed on the EnergySmart Schools program by the Dept of Energy.
- Last year, Congress did not approve the Administration's proposal to use \$3.7B in tax credits over five (5) years to help local governments issue \$25B in bonds. These figures are the same as those stated by the American Institute of Architects as the approximate cost of S.1454, H.R.1660 and H.R.1760.
- Recently, in January 2000, President Clinton proposed \$1.3B appropriation for school construction. This is included in the FY2001 Department of Education budget submission.



EnergySmart Schools

America's schools spend more than \$6 billion each year on energy. The U.S. Department of Energy (DOE) estimates they could save 25 percent of that money—\$1.5 billion nationally—through better building design, widely available energy technologies, renewable energy use, and improvements to operations and maintenance.

Schools that are smart about energy in their buildings, buses, and classrooms not only save money but reap a host of other benefits:

- ▶ Their classrooms are more conducive to learning, with better lighting, better temperature control, and less outside noise;
- ▶ Schools have more funds for teachers, computers, and other educational resources—not just today but for years to come;
- ▶ Their buses emit fewer dangerous pollutants, particularly into areas where children learn and play;
- ▶ Schools spend less time—thus fewer resources—maintaining and operating buildings and buses;
- ▶ By teaching about energy, schools create a generation of students who understand the math, science, and environmental impacts of energy use, and carry that into the future—our future.

Schools need help—we provide it

The EnergySmart Schools campaign is designed to motivate schools to use energy wisely, and help them do it.

Schools get training workshops, publications, recognition, and access to a broad network of private and public sector partners for help. On the local level, they can join or create community partnerships to benefit from even broader assistance—direct technical support and financing programs, among others.

Behind the scenes, the campaign works with legislators and policy-makers to develop incentives for energy improvements. We're also developing energy design guidelines to help schools be smart from the start, encouraging businesses to provide more school products and services, and working to eliminate policies and regulations that are barriers to school energy improvements.

Finally, the campaign creates and locates teaching materials so that tomorrow's decision-makers build better buildings, use renewable energy technologies, design better buses, and continue to be smart about energy.

Coordinating With Other Programs

The EnergySmart Schools campaign is operated by Rebuild America, in DOE's Office of Building Technology, State and Community Programs. The campaign shares information and resources with other DOE programs affecting schools: Clean Cities, which focuses on alternatively fueled buses; the President's Million Solar Roofs Initiative, aimed at increasing use of solar technologies; the State Energy Program, a DOE grant program administered through state energy offices; and ENERGY STAR®, a joint DOE/EPA program focused on improving energy performance in buildings.

Give Help—Get Involved

Businesses and organizations can join DOE in helping America's schools. They can participate in the EnergySmart Schools campaign through Rebuild America.

Our partners offer services and products ranging from workshops and publications to design and construction. In some cases, they provide school services such as building audits at no or low cost.

- ▶ Businesses can participate by becoming Business Partners. Contact Amy Tilton at atilton@aspensys.com.
- ▶ Local businesses and organizations can join or create community partnerships that include schools. To find a local partnership or obtain guidance for creating one, call DOE's hotline at 1-800-DOE-3732.
- ▶ National associations or government agencies can join as Strategic Partners. Contact Norma Dulin, ndulin@erols.com.

Students, teachers, and parents can also play an important role: they can encourage school administrators to design and renovate for energy efficiency, use renewable energy technologies, operate and maintain their buildings and buses efficiently, and use alternatively fueled buses.

Get Help—Get EnergySmart

Schools and school districts can tap a wealth of resources through the EnergySmart Schools campaign.

The EnergySmart Schools Web Site

Our web site provides specific guidance for building renovation and design, plus information about alternatively fueled buses. It also lists resources for teaching and learning about energy including the downloadable "Saving Energy Starts With Me" activities. The address is:

www.eren.doe.gov/energysmartschools

Rebuild America Community Partnerships

DOE's Rebuild America program helps schools and other building owners create local partnerships to plan and implement energy efficient, cost-saving building improvements. Go to the Rebuild America web site at www.eren.doe.gov/buildings/rebuild. To have your local Rebuild America representative contact you call 1-800-DOE-3732.

The Energy Efficiency and Renewable Energy Clearinghouse (EREC)

DOE created this hotline to answer specific questions about energy improvements and guide you to resources for help. Call 1-800-DOE-3732 or send an email to Don Fort at dfort@nciinc.





Trends Affecting School Energy Consumption

Rising enrollment is perhaps the most significant trend affecting school energy consumption nationally. The U.S. Department of Education estimates that the number of school-age children will be 54 million by 2007, a 1.5 million increase over 1998.

Districts across the country are renovating, constructing additional classrooms, and building entirely new schools to accommodate this increased demand. In fact, at least 3,000 new schools are expected to be constructed by 2007. If inefficient, these new and renovated schools will spend precious school resources—and taxpayer dollars—on high energy bills for years to come. If efficient, the next generation of schools will have more resources for educating children.

Other trends affecting school energy consumption are directly related to new educational approaches. Unless energy efficiency is addressed hand-in-hand with these approaches, schools will spend even greater sums on energy and have less for books and other educational resources. Now is the time to make schools smart about energy.

Expanded school hours

Districts across the country are embracing the concept of “Schools as Centers of Community,” hosting more non-student events and integrating more public facilities. The longer schools operate during the day, the more energy they use and the higher their energy bills.

The "house" or "cluster" concept

To provide a smaller school atmosphere, many large schools are grouping subsets of students into specific areas of buildings. These clusters often have their own facilities such as laboratories for science, computers, or foreign language instruction. Cluster-based schools often have more specialty classrooms, requiring larger schools and duplicate spaces to accommodate the same number of students. Larger schools require larger heating and cooling systems and other equipment, and have more windows, doors, and walls where air and noise can leak.

Shared resources

Some new schools are designed so that gymnasiums, cafeterias, libraries and other areas are shared among grades or even schools. This allows for more efficient use of space, lower energy bills, and lower construction costs.

Year-round classes

Schools that adopt year-round schedules are in use 15 to 30 percent more than schools with full summer breaks. In addition to expanding the time energy systems are in use, year-round schools operate during hot summer months when cooling bills can skyrocket.

More individual instruction

One-on-one instruction requires private areas where the teacher and student can interact undisturbed, often in private rooms. Schools providing such instruction must have more space to accommodate the same number of students.

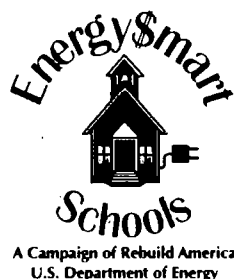
Computer-based education

Each computer station in a classroom reduces its capacity by one to one-and-a-half students. This means that schools must be larger to serve the same number of students. Printers, scanners and other computer devices also add to electricity consumption and increase utility bills.

Smaller class size

As schools strive to reduce student-teacher ratios, they typically add classrooms rather than moving walls within existing buildings. An expanded school can place more demands on energy systems. If the added classrooms are modular, energy consumption may increase even more, since the average modular classroom is far less efficient than a comparable permanent classroom.

Find out more at www.eren.doe.gov/energysmartschools



Myths About Energy In Schools

Myth: Energy isn't a major budget item for schools

Fact: In most school districts, energy costs are second only to salaries, exceeding the cost of supplies and books. Nationally, K-12 schools spend more than \$6 billion a year on energy, and a quarter of that could be reasonably saved through energy improvements.

Myth: Schools can't save much by being energy smart

Fact: Changes in behavior alone—such as turning off lights in unoccupied rooms and turning off computers at night and on weekends—can save an individual school thousands of dollars every year. Even vending machine lights can make a difference: the Seattle school district saved \$20,000 a year by turning off the lights in its 250 vending machines. Many other schools reap tremendous benefits by using energy efficient equipment and undertaking energy retrofits. By following a newly developed Christmas school shutdown protocol, the Idaho Falls School District saved about \$28,000 in energy costs over a ten-day period. In Tennessee, Washington County's Daniel Boone High School achieved a 34 percent reduction in annual energy costs since 1995 when it installed a geothermal heating and cooling system. Its savings have averaged \$82,000 annually.

Myth: Energy efficiency is not related to student performance

Fact: Evidence is growing that energy-efficient schools can provide learning environments that lead to improved student performance. In part, the link between smart energy use and improved learning is intuitive: students can't read the blackboard if lighting is inadequate; they can't hear teachers over noise through leaky windows or old heating systems; and they can't concentrate if they're roasting or freezing in classrooms with poor temperature control. In addition, studies by Pacific Gas & Electric Company and others have shown that daylighting—an integral part of most new energy-efficient schools—may have a positive effect on test scores.

Myth: Energy improvements require major upfront investment

Fact: Fortunately, financing options such as energy savings performance contracts and lease-purchase programs allow schools to make improvements with little or no investment. With performance contracts, an energy services company (ESCO) pays for the energy improvements, and is paid back over time through the utility bill savings the project creates. With lease-purchase programs, schools make payments each month and own the building or bus equipment at the end of the contract period. Also, some state energy offices have no-interest or low-interest loan programs to facilitate energy improvements.

Myth: New school buildings are energy efficient

Fact: New schools may be as inefficient as old ones unless a school directs its architect to design energy-efficient buildings. During the rush to construct new buildings and house additional students, schools may focus on short-term construction costs instead of long-term, life-cycle savings. Or, they may incorporate only minor energy efficiency measures. Well-designed schools are properly oriented on their site to take maximum advantage (or provide relief from) the sun. They use windows, walls, insulation, lighting systems, heating and cooling systems, and other elements that are efficient and well-integrated. And, they allow areas of the building to be shut-down when not in use, among other energy smart features.

Myth: Constructing an energy efficient school costs more

Fact: Total construction costs for energy efficient schools are often the same as costs for traditional schools even though individual building features may cost more. The reason is simple: efficient buildings leak less air and take better advantage of the local climate. Therefore, their heating and cooling systems—among the most expensive aspects of buildings—don't need to be as extensive to provide comfort. Even when design or construction costs are higher, energy savings can pay for additional upfront costs very quickly—sometimes in less than a year. A shining example is the Durant Middle School in Raleigh, North Carolina. Not only does this school save \$165,000 a year in energy costs, but it was constructed \$700,000 under budget.

Myth: Designing energy-efficient buildings takes more time

Fact: The design process for an energy efficient building is slightly different but not necessarily more time consuming. The process is less linear—design documents don't just go from architect to engineer to subcontractors, with each adding information at a specific stage. Instead, all of these professionals work closely together from the beginning to ensure that the building's systems are fully integrated with each other and with the structure. The key is to find an architect and engineer with experience and expertise in this type of design.

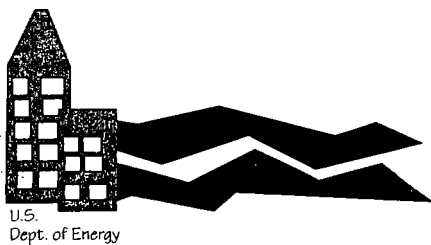
Myth: Deregulation of electricity utilities means schools don't have to worry about energy efficiency

Fact: Deregulation of electric utilities allows (or will allow) schools and other building owners to choose their electricity supplier, often based on rates. Those rates depend on many factors: the school's overall electricity demand, its pattern of electricity use throughout the day, and the predictability of its energy demand, among others. Schools that have sudden peaks in electricity demand due to inefficient equipment or operations are typically less attractive to utility companies so get higher rates. Also, schools that know how and when they use electricity will have valuable information in negotiating for the best rates.

Myth: Local communities won't support energy improvements

Fact: Energy smart design can be a selling point in bond elections: such schools not only offer their students greater comfort and opportunity for concentration, but use fewer taxpayer dollars to pay high energy bills.

Find out more at www.eren.doe.gov/energysmartschools



Rebuild America

Rebuilding America — one community at a time

THE BENEFITS

Rebuild America strengthens communities by:

- Improving building performance
- Reducing energy use
- Saving money
- Creating jobs
- Promoting economic growth
- Protecting the environment

The Program

Each year nearly \$100 billion is spent on the energy used to run America's commercial buildings and multifamily housing units. Rebuild America is a voluntary network of community partnerships determined to reduce this energy cost by saving energy locally. Rebuild America partnerships, joining with the U.S. Department of Energy (DOE), improve the energy efficiency of their communities' buildings.

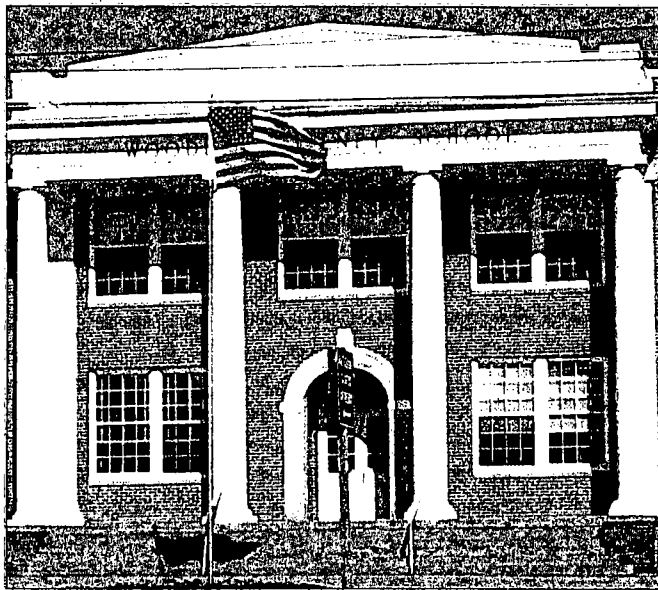
Working on a local level, Rebuild America helps community organizations access innovative technologies, industry services, customized assistance, and an array of business and technical tools. The program focuses on five building sectors: private commercial, State and local governments, K-12 schools, universities and colleges, and public and assisted housing.

The Approach

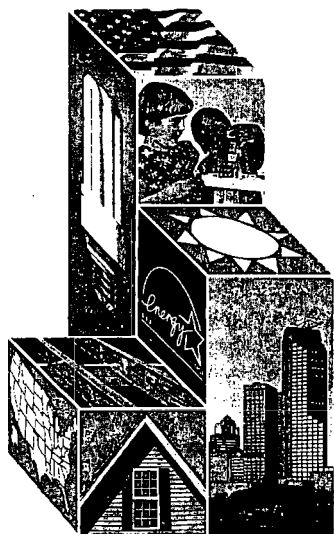
Rebuild America builds awareness among community leaders about the high price communities pay for inefficient buildings—and how wasted energy dollars can be redirected to pay for building improvements and other community needs. To help communities invest in their future by investing in energy efficiency, Rebuild America provides access to technical experts, training, guidance materials, and software; local and regional resources; peer exchange networks; and public recognition.

To join Rebuild America, a community organization initiates a partnership with local or State government, utilities, building owners, civic and environmental leaders, school administrators, nonprofits, and economic development organizations. Communities then have one year to set priorities for building improvements in an Action Plan. As a group, they choose target buildings, set goals for energy savings, look for ways to finance the projects, and decide how to coordinate and mobilize their efforts. Retrofit projects often focus on municipal buildings, college campuses, public schools, main street business districts, historic landmarks, and community housing.

*Rebuild America partners are transforming
the historic Woodland-Olney School
in Woodland, North Carolina, into
low-income housing for senior citizens.*



OFFICE OF BUILDING TECHNOLOGY, STATE AND COMMUNITY PROGRAMS
ENERGY EFFICIENCY AND RENEWABLE ENERGY • U.S. DEPARTMENT OF ENERGY



BUILDINGS FOR THE 21ST CENTURY

Buildings that are more energy-efficient, comfortable, and affordable . . . that's the goal of DOE's Office of Building Technology, State and Community Programs (BTS). To accelerate the development and wide application of energy efficiency measures, BTS:

- Conducts R&D on technologies and concepts for energy efficiency, working closely with the building industry and with manufacturers of materials, equipment, and appliances
- Promotes energy/money saving opportunities to both builders and buyers of homes and commercial buildings
- Works with State and local regulatory groups to improve building codes, appliance standards, and guidelines for efficient energy use
- Provides support and grants to States and communities for deployment of energy-efficient technologies and practices

The Results

By the year 2003, more than 250 communities will have committed to retrofit 2 billion square feet of floor space. These building improvements will save \$650 million in energy costs every year and reduce air pollution by 1.6 million tons of carbon dioxide annually.

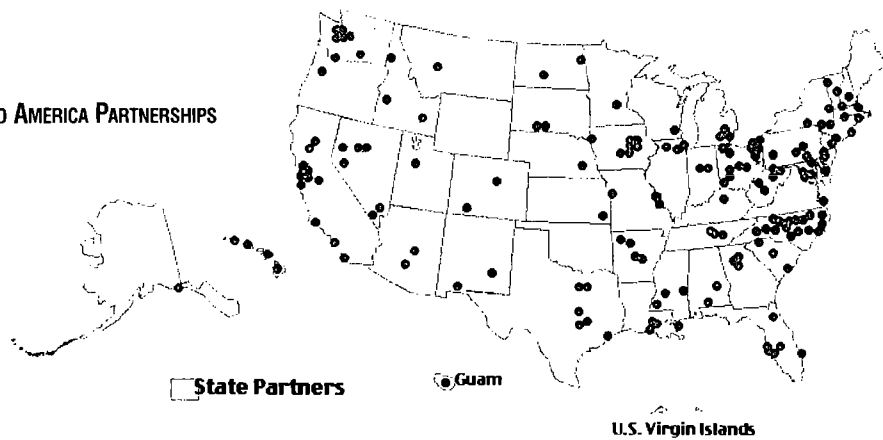
Since 1995, more than 200 partnerships have joined the effort. From rural Alaska to downtown Atlanta, communities nationwide are giving older buildings a new lease on life with innovative technology. Their renovation projects are helping business people, school districts, arts and culture organizations, and public agencies save 20 to 30 percent on their energy bills. This is money that can be put to work back in the community—buying computers for schools and books for libraries, revitalizing America's downtowns, and protecting the environment.

For example, Building Owners and Managers of Atlanta, Inc. (BOMA) has targeted 30 million square feet of commercial office and retail space for renovation. The Portland Energy Office has completed retrofits on 35.8 million

square feet, exceeding its target goals and using only 30 percent of the expected budget. Rebuild Idaho has audited 1 million square feet in the Idaho Falls School District and saved one school \$8,500 in 10 days during a vacation shutdown demonstration. Rebuild Webster City, Iowa, has retrofitted 20 buildings, including several schools, municipal buildings, churches, and private businesses by leveraging a small amount of Federal funding (less than \$50,000) into nearly \$5 million in energy efficiency improvements.

Partnerships are at work in 47 States, two U.S. territories, and several Native American tribes. Some partnerships have leveraged as much as \$25 million in private investment for their projects. They have also partnered with national financial institutions and Federal empowerment/enterprise zones, used municipal bond issues and revolving loan programs, and tapped commercial industry to fund projects. By 2003, Rebuild America communities will have generated \$3 billion in private community investment and created 26,000 new jobs.

REBUILD AMERICA PARTNERSHIPS



TO LEARN MORE ABOUT REBUILD AMERICA, CONTACT:

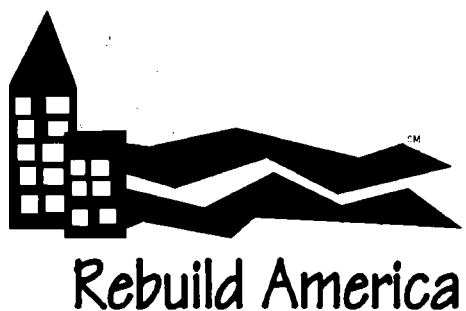
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1000 Independence Avenue, SW • Washington, DC 20585-0121 • (202) 586-9445

Visit the Rebuild America Web site at: www.eren.doe.gov/buildings/rebuild
Or call the Energy Efficiency and Renewable Energy Clearinghouse at: 1-800-DOE-3732



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January 1999 DOE/GO-10099-701



Rebuild America: A Summary Report of K-12 School Projects

February 2000

Rebuild America is a voluntary program of the U.S. Department of Energy that helps community partnerships make profitable investments in existing buildings through energy efficient technologies. By the Year 2003, Rebuild America partnerships will be involved in over 2 billion square feet of building renovations, which will save \$650 million every year in energy costs, generate \$3 billion in private community investment, create 26,000 new private sector jobs, and reduce greenhouse gases by 1.6 million tons of carbon dioxide a year. The program currently has over 250 partnerships. Through Rebuild America, DOE's *EnergySmart Schools* campaign promotes the improvement of the energy performance of both new and existing K-12 school buildings.

Please Note: *This report encompasses summary information for a number of Rebuild America partnerships actively pursuing school building improvements. The estimated data below represents the "committed" (that floorspace set as a retrofit goal in partnership action plans) or completed square footage for 37 of these partnerships. The data does not include the additional square footage and school districts "targeted" for the future by these 37 Rebuild partnerships or school projects planned by the other approximately 215 Rebuild America partnerships (data not yet available).*

SUMMARY OF ESTIMATED DATA:

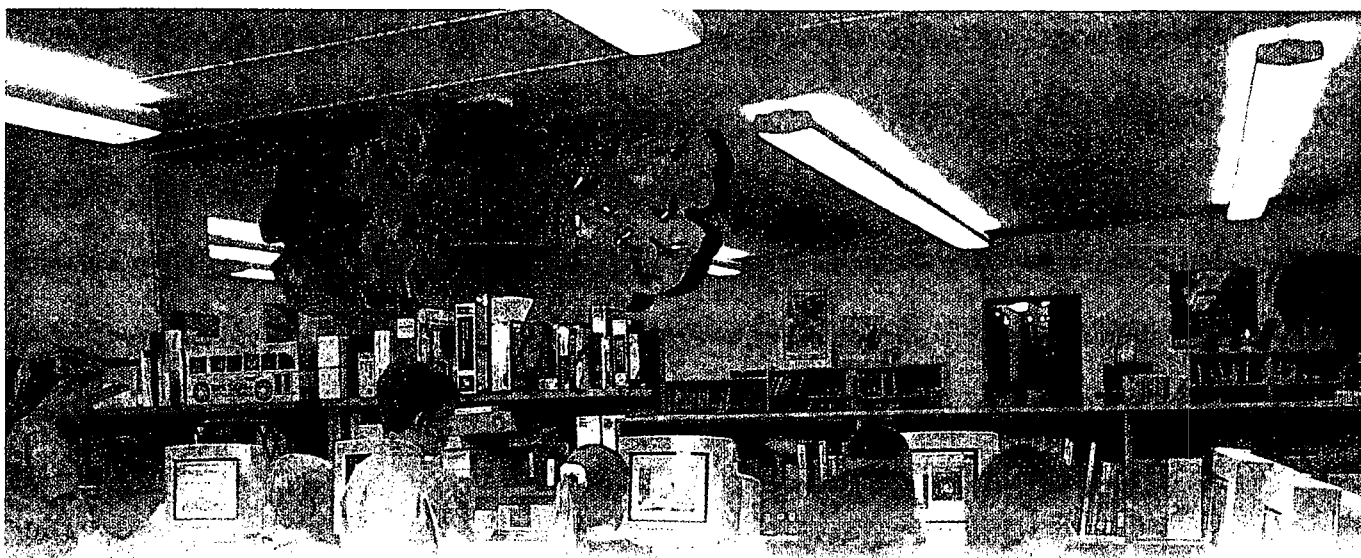
Number of partnerships working with schools:	37
Total number of school buildings:	2,400
Total number of school districts:	183
Total square footage committed:	61,386,000 square feet



BACK TO SCHOOL

FOR

ENERGY-WASTING BUILDINGS



BY DOUG HINRICHS

FROM TEXAS TO ALASKA, our public schools are in bad physical shape and waste a lot of energy. In a 1995 nationwide survey of schools conducted by the U.S. General Accounting Office titled *School Facilities: Conditions of America's Schools*, nearly 50 percent of school officials reported at least one unsatisfactory environmental condition—such as poor heating, lighting,

ventilation or air quality. More than 40 percent gave their school an unsatisfactory energy-efficiency rating. The same survey put a number of over \$112 billion as the figure needed in repairs, renovations, and modernizations for the nation's public schools.

As repairs and energy retrofits are ordered and undertaken for school buildings, they can serve as valuable

examples from which to learn. Basic thermodynamics can help operations and maintenance managers learn how to better manage energy loads and insulate for energy savings. Rechanneling energy savings uses inductive reasoning, along with elementary math skills, to prove that money is better spent on classroom improvements or teacher pay raises than high utility bills.

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Partner Update

September – October 1999

Office of Energy Efficiency and Renewable Energy

Profile



Mel Goodwin

Harmony Project Strikes While Iron Is Hot

Mel Goodwin, Harmony Project executive director and leader of its Rebuild America partnership, is pulling out the stops to focus the Charleston, SC community's attention on the opportunity to transform schools that are in poor condition into "high performance schools" that are economical to operate and provide superior learning environments. Goodwin views the schools as "agents of change" and the gateway to improving other buildings in the Charleston area through Rebuild America.

When Goodwin, an urban ecologist, saw that Charleston County had no firm plan for allocating \$175 million in school bond funds, he wanted to avoid the result he feared most – a Band-Aid approach to patching up schools sorely in need of major improvement.

In an effort to head off this possibility, he launched a "High Performance Schools Initiative" and began talking to the media about the need to press the Charleston County School Board to rehabilitate its school buildings by adopting cost-effective, sustainable

Continued on page 3

Rebuild America Helps Schools In Need

America's public schools are in trouble. With only 112,000 K-12 schools nationwide and over 25 school districts with over 100,000 students, there is growing pressure on financially strapped communities to do more with less. The stock of schools built during the baby boom that peaked in 1957, shrank in the late 1970s as enrollment thinned and school districts sold school buildings. Many that remain are vastly out of date today, inefficient and badly in need of repair—particularly in urban districts.

Building new schools is expensive. In the 1960s, a typical school could be built for under \$50 per square foot. The average is now twice that amount once the costs of inflation, building code compliance, and other costs are added. Despite higher costs, Maryland's Montgomery County School District is currently in the midst of a construction frenzy – about \$140 million worth – as builders work to create space for the enrollment boom. Still, many students will have to cram into 286 portable classrooms, or trailers, scattered throughout the county simply for lack of classrooms.

In response to this pressing national need, Rebuild America has opened up its 'tool chest' to offer building owners and managers information on how to save energy and dollars by making affordable improvements to school buildings.

Retrofits that Work

In rural Alaska, the local school is often the largest building in the community, which makes it well suited for demonstrating the benefits of energy-efficient retrofits. The high costs of transporting oil make for steep energy prices, as high as \$1 per kwh, prompting strong interest in energy conservation. **Rural Alaskans Conserve Energy**, a Rebuild America partnership, has audited a total of 21 buildings in seven villages and recommended energy conservation measures. Three of the seven villages have implemented those recommendations and have seen energy savings of 20-30 percent with cost recovery in less than two years.

The Tanana City School building is one example. With \$22,000 in state and school district funds, Alaska

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A SALUTE TO OUR NOMINEES

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Smith Tackles the Rockies

Rebuild America's message to make buildings more energy efficient has found fertile soil in Rocky Mountain country. Under the capable leadership of Linda Smith, program



Linda Smith

manager with the Governor's Office of Energy Conservation, **Rebuild Colorado** has signed on 66 partners across the state, including school districts, colleges, cities, counties, hospitals and public housing complexes. Most joined within the last eight months.

Five state agencies that served as the program's "training ground" are saving the state \$8 million annually through performance contracting, which allows tomorrow's energy savings to pay for today's investments in efficient equipment.

What accounts for the enthusiastic response in Colorado? For starters, the message of improving facilities with no up-front expenditures resonates well among building managers. Then add the program's inclusive approach to attracting key players and its educational efforts to stimulate interest in performance contracting.

"Our hallmark is to offer free on-site, hands-on assistance," Smith says. "When we visit a school district we try to meet with the facilities manager,

Continued on page 3

Making Schools "Energy Smart"

By Dan Reicher

As a new school year begins, administrators, parents, teachers and kids face the severe infrastructure problems in America's school buildings.

Consider some revealing statistics:

- the U.S. General Accounting Office reports a \$112 billion national backlog of needed school maintenance and repair exists;

- one-third of all schools report at least one building in need of extensive repair or replacement; and

- according to the American Association of School Administrators, 74 percent of schools were built prior to 1960.

Continued on page 4

Native American Tribes Are Saving Energy, Money

With the deregulation of the electric industry, Native American leaders are stepping up their efforts to address the high cost of energy, the demand for cleaner energy and the need for energy education in their communities. They're finding some solutions through Rebuild America.

The **Rosebud Sioux** of Rosebud, South Dakota, was the first Native American tribe to form a Rebuild America partnership, followed by the neighboring **Lower Brule Sioux**.



Dan Reicher (left) accepted a traditional Lakota star quilt on behalf of DOE from Rose Cordier.

Rebuild America program representatives Doug Avery and Dave Waltzman have also met with the Navajo, Yavapai Apache and Standing

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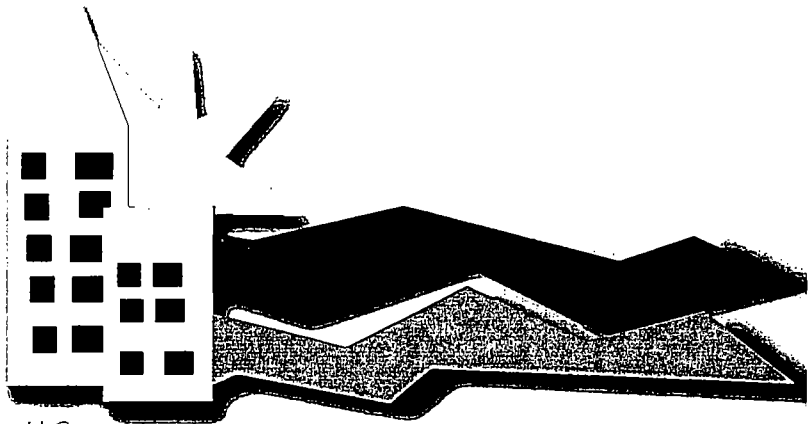
GEOTHERMAL HEAT PUMPS MAKE THE GRADE

7

FEDS SOFTWARE VERSION 4.0 AVAILABLE

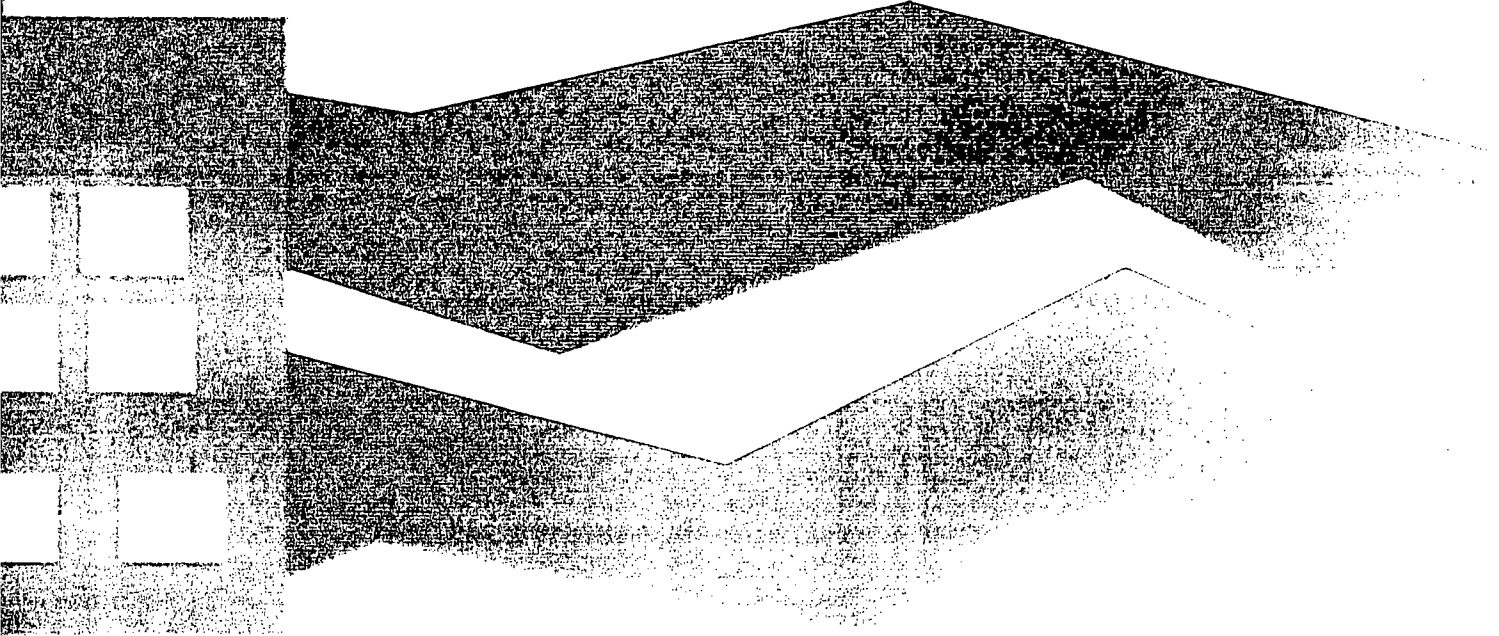


OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY
U.S. DEPARTMENT OF ENERGY



U.S.
Dept. of Energy

Rebuild America



OFFICE OF
BUILDING

STATE AND COMMUNITY PROGRAMS

Rebuild America helps communities be stronger, cleaner, and more envi-

ronmentally and economically sound through smarter energy use. The

program starts with building renovation — and expands from there — to

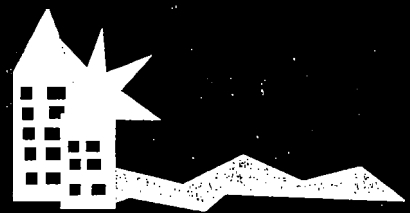
include renewable energy, efficient new building design, energy educa-

tion, and other innovative energy and resource conservation measures.

Ultimately, communities benefit from revitalized neighborhoods and

main streets, improved school facilities, better low-income housing, and

the positive economic impact brought by keeping local dollars at home.



U.S.
Dept. of Energy

Rebuild America

Buildings for the 21st Century

Buildings that are more energy-efficient, comfortable, and affordable . . . that's the goal of DOE's Office of Building Technology, State and Community Programs (BTS). To accelerate the development and wide application of energy efficiency measures, BTS:

- Conducts R&D on technologies and concepts for energy efficiency, working closely with the building industry and with manufacturers of materials, equipment, and appliances
- Promotes energy/money saving opportunities to both builders and buyers of homes and commercial buildings
- Works with State and local regulatory groups to improve building codes, appliance standards, and guidelines for efficient energy use
- Provides support and grants to States and communities for deployment of energy-efficient technologies and practices

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