

Gadsden ISD Energy Master Plan

September 13th, 2011

Gadsden ISD: Efficiency Opportunity

10% Energy Reduction for
Facilities Benchmarked
through the El Paso Electric
SCORESM Plus Program =

- ✓ \$214,000* in annual energy cost savings
*(includes both natural gas and electricity)
- ✓ Utility-paid cash incentives for implementing energy efficiency projects
- ✓ Improved usability / comfort in our offices classrooms, and other district buildings
- ✓ Environmental benefits equivalent to taking 228 passenger vehicles off the road each year
- ✓ Positive public relations in the community, including press releases and incentive check presentations for any projects completed in the SCORE Plus Program

Our Mission

Energy costs are an enormous expense for our nation's schools; energy is the second largest operating expense for Gadsden ISD. In order to significantly reduce these costs and improve energy efficiency, Gadsden ISD is participating in the El Paso Electric SCORE Plus Program. The no-cost program will assist in identifying energy efficiency opportunities in our school buildings, and help us to:

- ✓ ***Improve Learning Environments***
- ✓ ***Reduce Energy Expenditures***
- ✓ ***Boost the Local Economy (through upgrade projects)***
- ✓ ***Enhance Community Relations***

The program provides technical and financial assistance for efficiency upgrades. Whether we retrofit an existing building or incorporate energy-efficient technologies into new construction, we will identify and implement cost-effective projects that will allow us to use energy more efficiently. In addition, the El Paso Electric SCORE Plus Program will help us form a long-term strategy to address rising energy costs. As part of our participation and with assistance from the program, we have prepared this Energy Master Plan to outline where we are today and what steps we will undertake to improve the efficiency of our buildings in 2011 and beyond.

Strategies for Improvement

- ✓ By adopting certain energy management best practices, we can mobilize and coordinate our efforts toward reducing energy costs
- ✓ By adhering to the listed efficiency strategies, we can minimize the life-cycle cost associated with our energy-consuming equipment

Commitment

The Energy Master Plan is an adaptable, evolving document. It is a starting point for consensus and uniform action, which will ensure that all appropriate departments and parties are informed of and involved in our plans. Because it will adapt to changing needs and new information, it will never be “final” or concrete; however, approval of this plan will allow us to plan effectively and efficiently in terms of funding, personnel availability,

and other restraints.

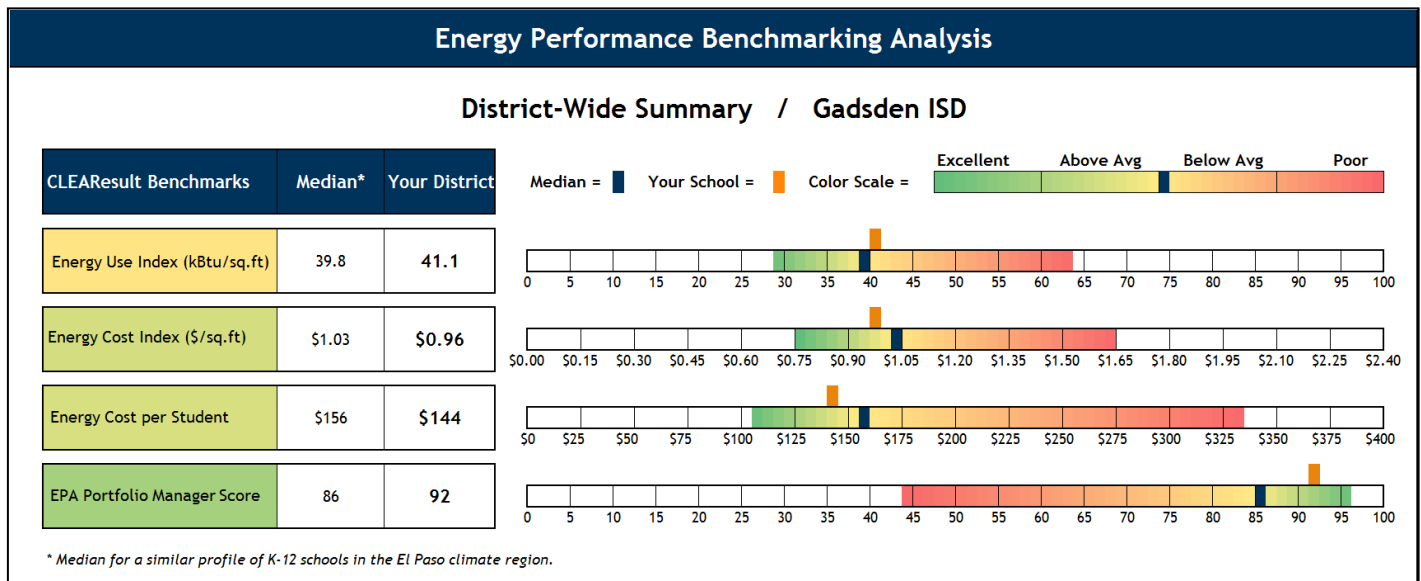
Project Implementation

- ✓ We have identified “low-hanging fruit” efficiency opportunities (e.g., Lighting Retrofits, HVAC, Controls), as well as other opportunities.
- ✓ El Paso Electric will pay us cash incentives for incorporating energy efficiency into equipment replacement/installation (e.g., lighting, HVAC) at our facilities by November 30, 2011 (all projects must be through post inspection by November 30, 2011).
- ✓ We have recognized a few of our energy-related accomplishments:
 - Individual School Cash Plans/Behavioral Modification Plans
 - Track energy usage with School Dude

Current Assessment

Based on the utility bills and building information we provided, the El Paso Electric SCORE Plus Program compared our energy use to other school facilities in our same weather region and the U.S. The benchmarking process revealed that our school district buildings are performing slightly below average overall. More detailed assessments of each individual building can be found in the Benchmarking Report Appendix.

- ✓ Our school district is paying 7 cents per square foot less than the median, which saves us approximately \$151,000 in annual energy costs.
- ✓ By reducing our current electricity consumption by 10 percent, we could save an estimated \$176,500 in annual *electricity* utility bills at the buildings included in the benchmarking analysis.



In addition to facility performance benchmarking, our energy management methods were also scrutinized against recognized “best practices” in the following key focus areas: Funding & Procurement, Planning & Decision-Making, Communication & Coordination, Evaluation & Assessment, Energy Management, and Personnel & Skills. Strengths in each category, along with strategies for improvement, are identified in the appendix.

Set Goals

The goal of implementing the Energy Master Plan is to avoid spending more money on energy than necessary. We attempted to quantify the “bottom-line effect” of improving the energy performance of our buildings. For the 24 buildings that we included in the benchmarking analysis, the chart below estimates how much reducing our electricity consumption would save us on electricity utility bills.

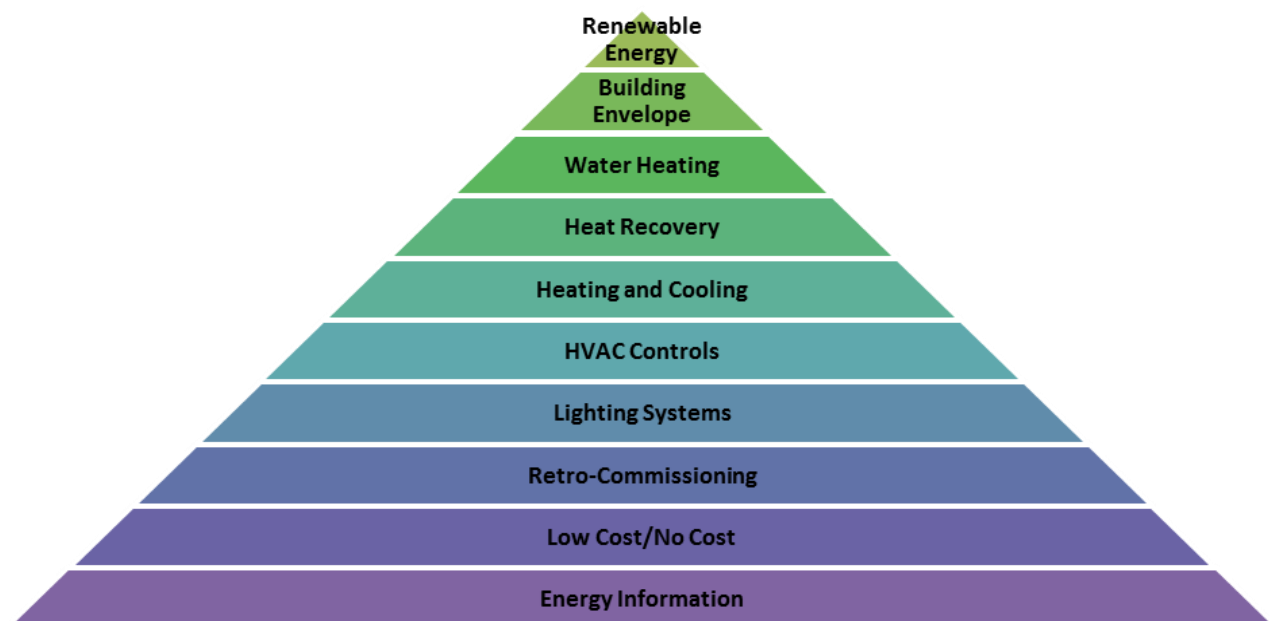
Annual Electricity Consumption (kWh)	Percent Reduction	Electricity Saved (kWh)	Our District’s Blended Rate	Annual Electricity Bill Savings
13,583,074	10%	1,358,307	\$0.13 per kWh	\$176,579
	20%	2,716,614		\$353,159
	30%	4,074,922		\$529,739

Energy Efficiency Pyramid - Where to Start

Renewable energy such as solar PV applications can provide several benefits including:

- ✓ Sustainable and renewable energy source
- ✓ Little to no maintenance costs
- ✓ Silent energy producer
- ✓ Produce energy on-site (off the grid)
- ✓ Produces zero emissions reducing overall carbon foot print

However, due to the complexity and high initial investment there are many other energy efficient measures that are more cost effective to implemented first. The graphic below demonstrates the increase in complexity and investment for commercial buildings including schools. The higher the project is on the pyramid, the higher the cost and complexity of the project. Our school district will use this structure as a guiding principle in our energy management in most cases; it is beneficial to start prioritizing energy efficiency upgrades or improvement by working up from the bottom of the pyramid.



Create Action Plan

In benchmarking our procedures against recognized “best practices,” we confirmed a number of areas in which we want to improve our energy management methods. The appendix provides a complete breakdown of short- and long-term steps toward improving energy management in each focus area. However, the table below identifies the highest priority “next steps” for Gadsden ISD:

Focus Area	Target Audience	Priority Items
Evaluation and Assessment	Management, School Board, Energy Management / Facilities Personnel	Create an Energy or Utility Committee. Meet quarterly to discuss progress, brainstorm ideas, help support the Energy Awareness Program/Cash Plans and prepare reports for school board review.
Funding and Procurement	Management, School Board, Energy Management / Facilities Personnel	Explore setting up an internal revolving fund to invest a portion of achieved energy savings or incentives received by El Paso Electric into additional energy management measures or training.
Communication and Coordination	Energy Management / Facilities Personnel, Principal, Teachers	Update Energy Awareness Program (School Cash Plans) that includes participation from principals, teachers, students and custodial staff. Award performance and create accountability among peers.

By continuing to refine our energy management practices at all organizational levels, we will ensure that we are getting the most out of our existing equipment and facilities. We will also position ourselves to identify, evaluate, and move forward with new energy efficiency investments on shorter timelines.

New construction, renovations, routine change-outs, and outdated and/or failing equipment all present opportunities to increase energy efficiency in our buildings. Unfortunately, many potential efficiency opportunities are left unrealized or delayed considerably. When less efficient equipment is installed or left in place, we incur higher utility costs over the life of the equipment. By taking the “life-cycle cost” and “cost of delaying efficiency” into consideration during our project evaluations, we will equip ourselves to make sound financial decisions.

Working with the El Paso Electric SCORE Plus Program, we have identified the strategies listed below for achieving energy efficiency. We will evaluate the feasibility of each strategy separately, and consider incorporating into written guidelines or minimum specifications for energy-consuming equipment. By having our own target design specifications, we will ensure that energy efficiency is always a consideration in our buildings.

Measure	Energy Efficiency Strategy
Lighting	25% improvement over the lighting power density (LPD) guidelines put forth by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1 2004
	30-40 foot-candles in office settings, per the guidelines of the Illumination Engineering Society of North America (IESNA) Lighting Handbook, 9 th Edition
	High-performance T8 lamps w/ premium efficiency ballasts in hallways, offices

Measure	Energy Efficiency Strategy
	High-bay fluorescents (T5, T8) in bay areas, multi-purpose rooms, and other applicable areas
	Automatic lighting controls (occupancy sensors, automatics daylight controls, time clock controls) and adjustable lighting level strategies (Bi-level switching)
HVAC	System size closely matches the actual building loads, thus increasing operating efficiency, reducing operating costs, and extending equipment service life
	Improvement over minimum equipment efficiencies specified in ASHRAE 90.1 2004
	Usage of demand control ventilation
Roofing	ENERGY STAR®-labeled Cool Roof materials
	Increased insulation value on roofing systems
Window	Thermo pane, low-emissivity glass, thermal break frames

Operation and Maintenance

Attention to operation and maintenance provides the most rapid means of reducing consumption and costs in most buildings. Not only do correct procedures aid in the proper utilization of the facility's equipment (heating, cooling, ventilation, etc.) and the energy involved, but they also help to maintain the attractiveness and increase the longevity of the building itself. We have identified the O&M strategies listed below to help us achieve our energy efficiency goals.

O&M Opportunities	
Off-Hour	• First round savings when building is unoccupied
	• After-hours, Weekends, Holidays
Computers & Office Equipment	• Computers
	• Monitors
	• Printers
	• Scanners
Unnecessary Lighting	• Offices
	• Common areas
	• Display
	• Exterior
HVAC Systems	• Photocell maintenance
	• Temperature Settings
	• System Scheduling
	• Ventilation
	• Sensor Locations
	• Obstructions to airflow
Exhaust Fans	• System maintenance
	• Meeting Rooms, Bathrooms, Maintenance Closets
Door & Window Operation	• Off at night
	• Blinds closed at night

O&M Opportunities	
Water Usage	• Close doors and windows
	• Weather-stripping
	• Drips and Leaks
	• Temperatures
	• Aerators

Recognizing Achievements

In addition to joining the El Paso Electric SCORE Plus Program, we have already taken a number of steps to reduce our school district's energy use:

- ✓ We have the structure in place with our School Cash Plans to establish a district wide Energy Awareness Program
- ✓ 15 of our 22 facilities have automated control systems
- ✓ We do not allow personal appliances in our buildings and teachers are encourage to utilize the teachers' lounge
- ✓ We have completed several lighting retrofit projects including de-lamping to reduce wattage and provide a better learning environment

We anticipate that by continuing to implementing projects identified through this Energy Master Planning process and adopting energy management best practices, we will continue to improve our energy performance and reduce expenditures, which will allow more of our budget to be spent where it should.

Endorsement

Although we will seek approval of individual projects and expenditures separately, we request a review and endorsement of this plan. This will ensure that our facilities personnel have a clear understanding of the input, concerns, and support of the Superintendent, School Board, and management.

The following people contributed to this plan:

Efren Yturralde, Superintendent	Randal Rapanut, La Union Elementary Principal
Richard Chavez, Associate Superintendent	Angelo Pokluda, Gadsden High Assistant Principal
Steve Suggs, Chief Financial Officer	Julian Mora, Gadsden High Assistant Principal
Richard Acosta, Finance	Miriam Bencomo, Anthony Elementary
Mark Rucpich, Chaparral High Principal	Vicente Sanchez, Riverside Elementary Principal
Carl Sullivan, Chaparral Middle Assistant Principal	Ralph Yturralde, Santa Teresa Elementary Principal
Don Smelser, Desert Pride Assistant Principal	William Dickson, STHS Assistant Principal
Jorge Arajuo, Gadsden Elementary Principal	Rosa Lovelace, STMS Principal
Cesar Gardea, Berino Elementary Assistant Principal	George McKamy, Sunrise Elementary Teacher
Arthur Moreno, Mesquite Elementary Assistant Principal	Teresa Navarro, Vado Elementary Principal
Cheryl Coyle, North Valley Elementary Assistant Principal	Raquel Ramirez, Sunland Park Elementary Principal
Leslie Jackson, Loma Linda Elementary Assistant Principal	
Miguel Villalobos, Chaparral Elementary Administrative Intern	
Ralph Gallegos, Executive Director for Energy Management & Construction	

Prepared and Submitted by:

Date _____

Ralph Gallegos, Executive Director for Energy Management & Construction

Endorsed by:

Date _____

Efren Yturralde, Superintendent

Date _____

Jennifer Viramontes, District 2 – Board Secretary

Date _____

Craig Ford, District 5 – Board President

Date _____

Maria Saenz, District 3 – Board Vice President

Date _____

Gloria Irigoyen, District 1 – Board Member

Date _____

Daniel Castillo, District 4 – Board Member

Planning and Decision-Making

We understand that inefficiency is often the result of low priority for building and operating high-performance buildings. We strive to place more importance on our planning regarding new building design, energy reduction projects in existing buildings, and our daily operational activities that impact energy performance.

Existing Strengths

- Our district has prioritized the need to improve energy efficiency and reduce costs
- Our administration, senior managers, and facilities staff view energy costs as a manageable/controllable expense
- Our school has a written energy policy or mission statement
- We have management support to identify and install energy efficiency-improvements quickly (if justified)
- We have identified the individual who is driving our energy efficiency efforts

Short-term Action Items

- Develop a written energy action plan for the next 1-5 years that includes performance goals, benchmarks, and other metrics regarding energy use and costs

Long-term Action Items

- Have a regular review of goals, plans, and successes to date compared to the plan

Evaluation, Assessment, and Monitoring

We need to establish a baseline and maintain ongoing benchmarks of how our buildings perform so we can determine the value of making improvements. This will allow us to recommend priorities for building improvements in an environment of limited resources (funding & staff).

Existing Strengths

- We know: 1) the energy operating cost of each building, 2) how each building ranks by various energy performance metrics, 3) how each building compares both within and outside our school district
- Our Superintendent and/or School Board monitor monthly energy use and costs
- We monitor daily or monthly energy use to look for variations from the normal energy use, and then analyze and resolve the causes of those variations
- We have prioritized facilities with the highest energy use for assessment and improvement
- We have conducted building “walk-through” opportunity-assessment surveys to identify energy saving opportunities in our facilities

Short-term Action Items

- Evaluate the building performance benchmarking reports from the El Paso Electric SCORE Plus Program that compare our buildings to others in our same weather region and across the U.S.

Long-term Action Items

- Conduct inventory surveys to list all energy-using equipment in our facilities
- Conduct an investment-grade audit in a facility when necessary
- Evaluate the connection between building energy efficiency and building usability (examples: comfort, indoor air quality, lighting levels, noise)

Funding and Procurement

Finding funds to improve existing buildings is always a challenge. Energy reduction projects, however, are often cost-effective and can even be self-funding. Nevertheless, we also understand that many funding or financing options for energy projects may have a level of complexity or risk not ideally suited for our schools.

Existing Strengths

- We have a budget line item or a defined process in place for budgeting energy-efficiency improvement expenditures
- We have funding available for energy-efficiency improvement projects in this year's budget
- We have a strategic plan for budgeting energy-efficiency improvements for the next 2-5 years
- We have defined criteria and authority to approve improvement projects (example: one year payback, or up to a dollar limit)
- We have established a list of potential vendors to provide energy-related assessments, products, and services

Short-term Action Items

- Take full advantage of the available incentive dollars through the 2011 El Paso Electric SCORE Plus Program to make our energy improvement projects even more cost effective
- Calculate and compare the cost of not doing the project (e.g. maintaining the status quo) when evaluating the value of energy-efficiency projects

Long-term Action Items

- Investigate other funding options beyond using Board approved capital budgets (such as grants, loans, performance contracts, lease purchase agreements, etc)

Communication and Coordination

Energy costs are a significant expenditure and some portion is a controllable cost. To successfully manage energy costs, the facilities department needs to communicate regularly and effectively with the Superintendent, School Board, Principals, and other departments.

Existing Strengths

- We have a list of energy-efficiency improvements completed at our district within the last five years
- We have established an Energy Awareness Program for principals, teachers, students, and custodial staff

Short-term Action Items

- Provide reports to our Principals on energy use and cost at least quarterly

Long-term Action Items

Personnel and Skills

Our district must employ personnel with adequate and appropriate skills to manage energy performance and costs. Moreover, our staff needs to have the responsibility, accountability, incentives, and time to consistently tackle the challenges of effective energy management.

Existing Strengths

- Our school district provides training and conference opportunities related to energy management for our key energy management personnel
- Our school district provides recognition or incentives for exemplary energy performance for energy management personnel (awards, prizes)

Short-term Action Items

- Identify ways that we can increase the amount of time that our energy management personnel have to focus on improving buildings' energy performance

Long-term Action Items

- Create clearly defined job performance criteria and accountability for our key energy management personnel

Energy Management Processes

Given the importance, complexity, and cost of energy utilization in the school district, we strive to have management policies and procedures that promote effective energy management.

Existing Strengths

- We commission new equipment and facilities with testing and verification of performance at startup
- Our contractors provide us with written performance specifications and operating and maintenance procedures/manuals for all major energy-using systems (example: boilers, chillers)
- We have written guidelines that outline operating rules (such as building usage, operating hours, personal refrigerators/heaters and plug loads), and enforce them regularly
- We monitor and adjust system operations when occupancy, demands, or loads are reduced (examples: temperature setbacks, lighting controls)

Short-term Action Items

- Specify that classroom lighting levels be at 30 - 40 foot-candles for retrofits and new construction to ensure that rooms are not over-lit
- Strive to purchase higher efficiency (15 or 16+ SEER) A/C equipment when replacing existing units
- Develop written design guidelines and minimum efficiency specifications for energy-consuming equipment for new construction, renovations and improvement projects
- Perform "retro-commission" of older & high-operating cost systems over last few years

Long-term Action Items

- Consider adopting the following operating practices: 1) Establish HVAC set points to "lock out" thermostats, 2) Charge for personal use refrigerators, microwaves, etc, 3) Use software to turn off computers not in use
- Research additional opportunities for improving energy performance, such as installing LED signs, ENERGY STAR roofs, increased levels of insulation, occupancy sensors, more effective control systems, solar film for windows, solar water heating systems for large domestic hot water loads, and solar panels for electricity