Brownsville Independent School District Energy Management Plan

BISD Board of Trustees Approved (January 19, 2010 – Agenda XI. General Function, A. Item 16)

PURPOSE:

The intent of this plan is to create a comprehensive document that identifies energy and water conservation and efficiency as significant issues for the entire school district. This document is intended to detail realistic steps that BISD administrators, staff, teachers, and students will take to address specific energy issues and reach the established goals of the district. This plan should be reviewed and updated periodically as energy technologies and the district's strategic energy plan changes.

I. ENERGY PLAN STATEMENT:

Recognizing our responsibility as Trustees, Administration, Staff, Teachers, and Students of the Brownsville Independent School District (BISD), we are committed to make all reasonable physical, procedural, and behavioral efforts to conserve energy and our natural resources while also reducing the cost of educating our students. Recognizing that convenient natural resources such as coal, oil, gas, and water are being depleted yet are faced with continuous increases in demand while becoming more expensive, we must become proactive in conserving energy and reducing costs.

There are three key elements in BISD's energy strategy:

1) Conservation. Energy consumption will be reduced by 5 percent per year for 6 consecutive years beginning with the energy program establishment in 2006 and as required by Texas HB 3693 adopted in September 2007. This will be accomplished in the short-term by reducing energy usage per student within the District's presently owned and operated facilities and in the long-term by the replacement of inefficient energy consuming equipment with efficient equipment. A combination of manual and automated operating methods will be employed.

2) Consolidation. It is the goal of the District to combine multiple meters on individual

campuses into a single meter for each campus. This program can significantly reduce energy demand costs and customer service charges while providing for a more concise method for monitoring demand and consumption.

3) Monitoring. Monthly and yearly maintenance of accurate records of energy and water demand and consumption has been implemented which will allow for periodic audits and analyses. The District is currently tracking, verifying, and posting utility payments in accordance with Texas HB 3693 and state guidelines. Monitoring methods currently used will allow for "per student" and "per square foot" benchmarks with direct comparisons between schools and school classifications. Annual reports of the District's and campus' accomplishments toward the District's energy conservation and cost saving goals will be provided to the public, to the State Energy Conservation Office (SECO), and to the Texas Water Development Board (TWDB).

The District will develop and adhere to a more comprehensive energy plan which will be included within a "strategic energy management plan" incorporating the above criteria.

This plan commitment is the joint responsibility of the Board and all District personnel including the Superintendent, administrators, principals, teachers, students, support personnel, and patrons. Cooperation is expected on all levels to assure the success of the energy plan. For these reasons, effective energy management shall be incorporated into the criteria used in the evaluation of each campus, principal, and department head administrator.

II. Conservation

A. History

BISD has a history of being proactive in energy conservation and reduction of energy costs. In 2005, BISD contracted with Energy Smart Corporation (ESC) to perform comprehensive energy audits and cost reduction studies designed to reduce energy usage, improve energy efficiencies, and reduce energy costs to the district. BISD has already saved millions of dollars by implementing many of the ESC energy savings recommendations. These include changing energy suppliers, consolidating meters, eliminating expensive maintenance contracts, signing operating agreements, replacing inefficient lighting, requiring more efficient HVAC equipment, installing programmable thermostats, and numerous other actions.

B. Mandates

The BISD Board of Trustees committed to the State Energy Conservation Office (SECO) in November of 2007 to reduce energy consumption by 5 percent per year for 6 consecutive years. By following the specific guidelines outlined in Section III following, the district will achieve committed energy savings and, with the help of all administrators, staff, teachers, custodians, and students, additional significant energy savings will be achieved.

C. Responsibilities

To be effective, it is essential that the BISD energy plan be rigidly enforced. For this reason, responsibilities must be assigned and accepted. The **teachers** will be responsible for implementing this plan in classrooms during the time that he/she is in the classroom. The **head custodian** will be responsible for implementing the plan in all school storage and common areas as well as other unoccupied spaces. **Staff members** will be responsible for plan implementation within their own offices, lobbies, etc. while they occupy such spaces. The school **principal** will be responsible for the total energy usage of the entire campus including oversight of energy related delegated responsibilities. The principal will also ensure that the head custodian performs an end-of-day school shutdown checklist and a weekend shutdown checklist to make certain that all energy consuming building systems are operated in an energy conserving manner.

III. Specific Measures

A. Buildings

Doors and windows of all conditioned spaces will be kept closed. Personal computers, monitors, printers, other office equipment, and lights will be turned off when not in use. Air conditioners should be set at higher temperatures and heaters at lower temperatures when rooms are not occupied. The use of personal heaters is prohibited. Power management features of personal computers should be enabled if available. If power management is not available, software and/or hardware will be installed to shut off such devices after a brief period of inactivity. Where rooms are heated excessively due to sunlight infiltration, plastic solar shielding film can be obtained from the maintenance department. Such film will reduce solar heating in summer and will improve insulating qualities of single pane windows in the winter. This film may be installed by custodians or by the maintenance department. As time and funding allow, buildings and mechanical systems will be added to the existing or future new energy management system (EMS). This will ensure greater control over HVAC operating schedules, improve temperature control, reduce energy consumption, and permit implementation of demand management strategies while reducing energy costs.

B. New Construction

New construction should be designed and built to minimize energy use. The most recent version of ASHRAE Standard 90.1 - Energy Efficient Design of New Buildings Except Low Rise Residential Buildings should be set as the minimum energy efficiency guideline, since it has been shown that further reductions in energy use are economically achievable. The design process should include energy life cycle costing analyses. New construction should be added to the existing building automated control system for enhanced energy management capabilities. Alternative energy sources such as passive solar heating and heat recovery should be considered, as well as use of daylight for lighting and other strategies for decreasing building energy consumption. Primary consideration should be given to connecting and/or extending central systems for heating, cooling, and other mechanical systems. Year-round cooling needs should be met by utilizing the most energy efficient systems, for example plate-and-frame heat exchangers versus less efficient air-cooled shell and tube systems. All new construction should include utility metering of electricity, natural gas, and water.

C. Lighting

Most lighting at schools is being retrofitted or upgraded to high efficiency T8 fluorescent lighting with electronic ballasts. Remaining areas should be upgraded as funding becomes available. New construction and remodels should use high efficiency lighting and eliminate incandescent lighting. Interior decorative lighting should be kept at a minimum and exterior decorative lighting should be discouraged. Lighting levels recommended by the Illuminating Engineering Society Lighting Handbook should be used as a guideline to avoid over-lit spaces. Increased use of daylight and daylight controls should be considered because use of day-lit spaces decreases energy costs and may improve productivity.

Teachers, office staff, custodians, cleaning personnel, and students are encouraged to refrain from turning on more lights than are necessary to accomplish their tasks. Remember that most lights not only consume electricity but also give off heat which, in turn, places and additional load on air conditioning equipment and, thereby, increases the use of electricity necessary to cool the room or area.

All unoccupied areas, even for short periods of time, will have the lights turned off. After the school day has finished, custodians and cleaning personnel will turn on lighting only in area they are working in. Lights in all gymnasiums, cafeterias, auditoriums, dressing rooms, etc. will not be left on unless such areas are being used. All exterior lights will be turned off during daylight hours. No football, baseball, soccer, or similar field lighting will be turned on during daylight hours even for testing purposes.

Decorative or other type personal lamps are prohibited in all offices and classrooms. Incandescent lighting of any type except for approved stage or theater usage is prohibited.

D. Heating

During the heating season, room temperatures should be maintained between 69° F and 70° F when occupied. Whenever it is economically and technically feasible, night setback features of programmable thermostats will be utilized to allow temperatures to drop to 55° F during unoccupied periods. If not equipped with programmable thermostats, temperature settings for heating should be lowered manually to 55° F or the unit(s) should be turned off when areas are not in use. The only exceptions to this plan are special areas that require constant or warmer temperatures. The energy manager's office will evaluate requests for exemptions on an individual basis. The maintenance department will utilize the most energy efficient means of supplying heat for approved off-hour/holiday requests. Electric heat strips shall never be used for the control of mold or mildew. If mold or mildew conditions are observed, these must be reported immediately to the maintenance department. Dehumidifiers may be used if necessary.

All classroom and office doors, windows, and vents will be closed when heating equipment is in use. During spring, summer, and fall seasons, when there is no threat of freezing conditions, all steam and forced air heating systems should be switched off. Hot water systems should be switched off using the appropriate loop pumps.

Domestic hot water systems for all restrooms shall be set no higher than 105° F. Hot water systems for cafeterias and other cooking areas should be set no higher than 120° F except for dishwashing requirements which may require settings up to, but not to exceed, 140° F. All hot water re-circulating pumps will be shut down during unoccupied time periods.

Use of resistance type electric heaters in school buildings will be eliminated. Areas that are either too hot or too cold should be reported as soon as possible to the maintenance department. Personal space heaters, electric blankets, foot or leg warmers, and other energy consuming heating devices are prohibited.

E. Cooling

During the air-conditioning season, room temperatures should be maintained between 75° F and 78° F when occupied. Whenever it is economically and technically feasible, night setback features of programmable thermostats will be utilized to allow temperatures to rise to 82° F during unoccupied periods. The only exceptions to this plan are special areas such as those that require constant or cooler temperatures. The Energy Manager and

maintenance department will evaluate requests for exemptions on an individual basis. Window or wall air conditioners are used in areas that lack central cooling. If not equipped with programmable thermostats, temperature settings for these units should be raised manually to 82° F or the unit should be turned off when areas are not in use. Administration supervisors are encouraged to accommodate reasonable requests from employees and teachers who wish to wear more casual clothing because of the increased temperatures. Areas that are too cold or too hot should be reported to the maintenance department. Personal cooling devices, including fans, are prohibited.

All classroom and office doors, windows, and vents (except for mandated fresh air intakes) will be closed when cooling equipment is in use.

F. General Usage

All personal computers (PCs), monitors, printers, speakers, copy machines, scanners, laminating equipment, and other office equipment will be turned off as soon as the school day ends. Uninterruptible power supplies should be turned off where practical. Fax machines, clocks, security equipment, and emergency lighting are excluded from this requirement**.** All PCs, printers, monitors, copiers, and similar equipment should use energy management features (hibernation mode, etc.) if the devices are so equipped. If PCs and monitors are not so equipped, software and/or hardware shall be purchased and installed that will perform this function. Personal devices such as coffee pots, toasters, microwaves, refrigerators, aquariums, etc. are prohibited.

G. Water Usage

Use of irrigation water should be minimized through rainfall monitoring either by using manual or automated means for ensuring that lawns and fields are not sprinkled during rains. The district should also investigate collecting storm-water for non-potable uses on campuses. Low water use flush valves and flow restrictors on toilets, faucets, and showers should be used in dressing rooms and restrooms. No single-pass cooling water will be used on mechanical equipment in new construction or remodels. Existing equipment that uses single-pass cooling water will be eliminated as time and funding allows. Water that does not go to the sanitary sewer system (such as lawn irrigation, cooling towers, and fountains) should be metered separately to obtain a lower rates or credits from the water supplier. Water leaks, dripping faucets and fixtures that do not shut off should be reported to the maintenance department.

H. Transportation

Use of the local bus system and car/van pooling should be promoted. Faculty, staff, and students are encouraged to walk, bike, or use bus transportation rather than using district or personal vehicles. Fleet vehicles used on campus should not be left idling for more than a few minutes. Acquisition of new BISD fleet and bus vehicles should be reviewed thoroughly, and all vehicles should be purchased with the highest practical fuel efficiency.

I. Purchasing

Energy efficient products should be purchased whenever possible. For examples, see the U.S. Environmental Protection Agency "Energy Star" products list. Recyclable and reusable products should also be purchased when feasible to reduce disposal costs. This is especially true regarding HVAC equipment. The district will immediately cease purchasing less efficient heating and air conditioning equipment both for new installations and replacements at existing facilities.

J. Recycling

The maintenance department is responsible for the district recycling program. Disposal of materials in the solid waste stream represents an increasing expense for the district. Design of school and office facilities should incorporate the facilities necessary to make recycling convenient for district users. When economically feasible, recycling should be expanded to include such things as green waste (for composting), construction waste, and used office waste such as computers. For more information on recycling, please see the EPA and state recycling website or contact the maintenance department.

IV. Continued Success

There are several ongoing activities that will help ensure the success of BISD's energy plan.

A. Monitoring

No energy conservation program will be successful if progress is not monitored and tracked on a continuing basis. A system tracking monthly bills has been implemented which will allow for periodic audits and analyses. The District is currently tracking, verifying, and posting utility payments in accordance with Texas House Bill 3693, Senate Bill 12, and other state guidelines. Monitoring methods currently used allow for "per

student" and "per square foot" benchmarks with direct comparisons between schools. Current up-to-date reports of the District's and campus' accomplishments toward the District's energy conservation and cost saving goals are presently available to the public and to the State Energy Conservation Office (SECO) on the publically accessible website www.TexasSchoolPost.com. BISD will continue to post all monthly electricity, natural gas, and water bills on this site.

Most campuses currently have multiple meters which will be consolidated in the future resulting in greatly reduced demands at most school campuses. Most cafeterias will have BISD owned metering devices installed solely for the purpose of monitoring cafeteria demand and consumption separately but meter readings from these devices are to be used only for internal budgeting and funding purposes.

B. Training

Training must be provided to ensure that both operations and service technicians have the skills and knowledge to effectively apply the technology used to achieve energy savings. Training will be provided to staff and teachers during "In-Service" seminars prior to each school year plus additional unscheduled training as technology or policies change (e.g., whenever a new EMS system is installed). Classroom training of students will be encouraged using any of the numerous training courses available and endorsed by Energy Star guidelines, state, or federal agencies.

C. Maintenance

Mechanical system efficiency tends to degrade over time. Proper maintenance is required to ensure that systems operate as efficiently as possible. Preventative maintenance programs were implemented in 2007 which ensure that HVAC filters are now changed on a regular basis and that all HVAC equipment is properly monitored, serviced, and maintenance records are kept up-to-date. Any energy consuming device that appears to not be in the best possible working order will be immediately reported to the maintenance department for service.

D. Education, Curriculum

District administration, faculty, staff and student cooperation and support of the energy plan are imperative to its success. An education program that provides information on utility costs, trends, and user impact on these costs will enable the campus population to understand the need for this plan, and how it can positively impact them by freeing up money from utility expenses for educational purposes.

The District will fully comply with TEXAS ESSENTIAL KNOWLEDGE AND SKILLS (TEKS) requirements including, but not limited to, the requirements of Subchapter B issued under the Texas Education Code, §28.002 including:

§112.21. Implementation of Texas Essential Knowledge and Skills for Science, Middle School.

§112.41. Implementation of Texas Essential Knowledge and Skills for Science, High School.

E. Incentives, Rewards

An incentive program designed to promote energy savings is adopted with this plan and includes competition between school campuses. Each high school will compete with all other high schools to reduce energy consumption. Likewise, each middle school will compete with all other middle schools and each elementary school will compete with all other elementary schools. Schools in each of the categories (high, middle, and elementary) will be recognized monthly based on the greatest energy use reduction for that month. Similarly, each school will be recognized for the greatest energy use reduction for the calendar year. School selection will be made by BISD's Energy Manager, based on costs per student comparisons for all schools in the specific category.

Those monthly winners will be rewarded both by a recognition certificate and by having funds placed in their extra-curricular activities fund equal to one-half of the actual energy savings for that month. Yearly winners will be rewarded by a formally presented recognition plaque, a lump sum reward of $5,000 to the school, and nomination of the school for district, region, and state rewards.