



PHASE 1 ENERGY MANAGEMENT PLAN – SUMMARY SFY 2012-2013

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SFY 2012-2013 GOALS

**Total baseline for electricity and water cost
combined:**

\$4,027,888.18

Goal for 2012-2013 = 3% reduction or \$120,836.64

SFY 2012-2013 RESULTS

Actual 2012-2013 cost = **\$3,819,421.40**

.... or a savings of **\$208,466.78**

.... or **143%** of our goal.



DISTRICT GUIDELINES FOR SET-POINTS

Our district set-points have been established (utilizing a number of recognized methods and standards) to provide the most comfortable learning and working environment possible while still focusing on the responsible use of our energy resources. Below are the guidelines for our district along with a comparison of others' in the area.

- ❖ **JISD** –75° cooling and 69° heating (with a +/- 2° differential)
- ❖ **NISD** –75° cooling and 71° heating (with a +/- 1° differential)
- ❖ **NEISD** - 75° cooling and 69° heating (with a +/- 2° differential)
- ❖ **SCUCISD** - 75° cooling and 69° heating (with a +/- 2° differential)

***OUR GUIDELINES REFLECT RECOGNIZED STANDARDS
ENDORSED BY THE FOLLOWING ORGANIZATIONS***



DEVELOPING A CONSENSUS



Indoor Air Quality Tools for Schools
REFERENCE GUIDE



Indoor Air Quality (IAQ)

DESCRIPTION OF HVAC SYSTEMS

The two most common HVAC designs in schools are unit ventilators and central air-handling systems. Both can perform the same HVAC functions, but a unit ventilator serves a single room while the central air-handling unit serves multiple rooms. For basic central air-handling units, it is important that all rooms served by the central unit have similar thermal and ventilation requirements. If these requirements differ significantly, some rooms may be too hot, too cold, or underventilated, while others are comfortable and adequately ventilated.

Most air-handling units distribute a mixture of outdoor air and recirculated indoor air. HVAC designs may also include units that introduce 100 percent outdoor air or that simply recirculate indoor air within the building. Uncontrolled quantities of outdoor air enter buildings by leakage through windows, doors, and gaps in the building exterior. Thermal comfort and ventilation needs are met by supplying "conditioned" air, which is a mixture of outdoor and recirculated air that has been filtered, heated or cooled, and sometimes humidified or dehumidified. The basic components for a central air-handling unit and a unit ventilator are illustrated in the *IAQ Background*.

THERMAL COMFORT

A number of variables interact to determine whether people are comfortable with the temperature and relative humidity of the indoor air. Factors such as clothing, activity level, age, and physiology of people in schools vary widely, so the thermal comfort requirements vary for each individual. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 55-1992 describes the temperature and humidity ranges that are comfortable for 80 percent of people engaged in largely sedentary activities. That information is summarized in the chart to the right. The ASHRAE standard assumes "normal indoor clothing." Added layers of clothing reduce the rate of heat loss.

Uniformity of temperature is important to comfort. Rooms that share a common heating and cooling system controlled by a single thermostat may be at different

temperatures. Temperature stratification is a common problem caused by convection—the tendency of light, warm air to rise, and heavier, cooler air to sink. If air is not properly mixed by the ventilation system, the temperature near the ceiling can be several degrees warmer or cooler than near the floor, where young children spend much of their time. Even if air is properly mixed, uninsulated floors over unheated spaces can create discomfort in some climate zones. Large fluctuations of indoor temperature can also occur when thermostats have a wide "dead band" (a temperature range in which neither heating or cooling takes place).

Radiant heat transfer may cause people located near very hot or very cold surfaces to be uncomfortable even though the thermostat setting and the measured air temperature are within the comfort range. Schools with large window areas sometimes have acute problems of discomfort due to radiant heat gains and losses, with the locations of complaints shifting during the day as the sun angle changes. Poorly insulated walls can also produce a flow of naturally-convecting air, leading to complaints of draftiness. Closing curtains reduces heating from direct sunlight and reduces occupant exposure to hot or cold window surfaces. Large schools may have interior ("cann") spaces in which year-round cooling is required to compensate for heat generated by occupants, office equipment,

All schools need ventilation, which is the process of supplying outdoor air to occupied areas within the school.

RECOMMENDED RANGES OF TEMPERATURE AND RELATIVE HUMIDITY

Relative humidity	Winter Temperature	Summer Temperature
30%	68.0°F - 75.0°F	74.0°F - 80.0°F
40%	68.0°F - 75.0°F	73.5°F - 80.0°F
50%	68.0°F - 74.5°F	73.0°F - 79.0°F
60%	67.5°F - 74.0°F	72.5°F - 78.5°F

Recommendations apply for persons clothed in typical summer and winter clothing, at light, mainly sedentary activity.

Source: ASHRAE Standard 55-1992, Thermal Environmental Conditions for Human Occupancy

CURRENT STATISTICS

- ❖ 53% reduction in “Hot and Cold” calls from last year
- ❖ Electricity savings of **\$105,875.33** for the first *three* months of 2013-2014
- ❖ Earned incentive of **\$45,540.00** from CPS DR Program
- ❖ Energy cost per ft² 2011-2012 - **\$1.05**, 2012-2013 - **\$.99**

“KEEPING THE MOMENTUM”

SFY 2013-2014 AT A GLANCE

- ❖ Continued roll-out of 100% Recycling Program
- ❖ Solar Projects – *JISD Renewable Energy Trail*
- ❖ Middle School gym lighting upgrades X 2
- ❖ CPS “Demand Response” program - \$45,540.00
- ❖ Incentives and Performance Pay-Outs \$\$\$\$\$\$
- ❖ Plumbing fixture retrofits and upgrades
- ❖ Contests for students
- ❖ Vampire Walks
- ❖ Energy Management Intern Program

PERFORMANCE PAY-OUTS

- ❖ Campuses to be paid based on a reduction from the same time period the previous year
- ❖ Last year we would have paid out **\$8,454.00**
- ❖ Last year's largest overall KWh reduction was Coronado Village Elementary = **24.55%** or approximately **\$1,227.00!**
- ❖ Contest to run from 9/1/2013 through 1/31/2014
- ❖ Incentives paid out prior to Spring Break 2014