



# Energy Management Overview

## School Year

### July 2007 - June 2008

## Accomplishments

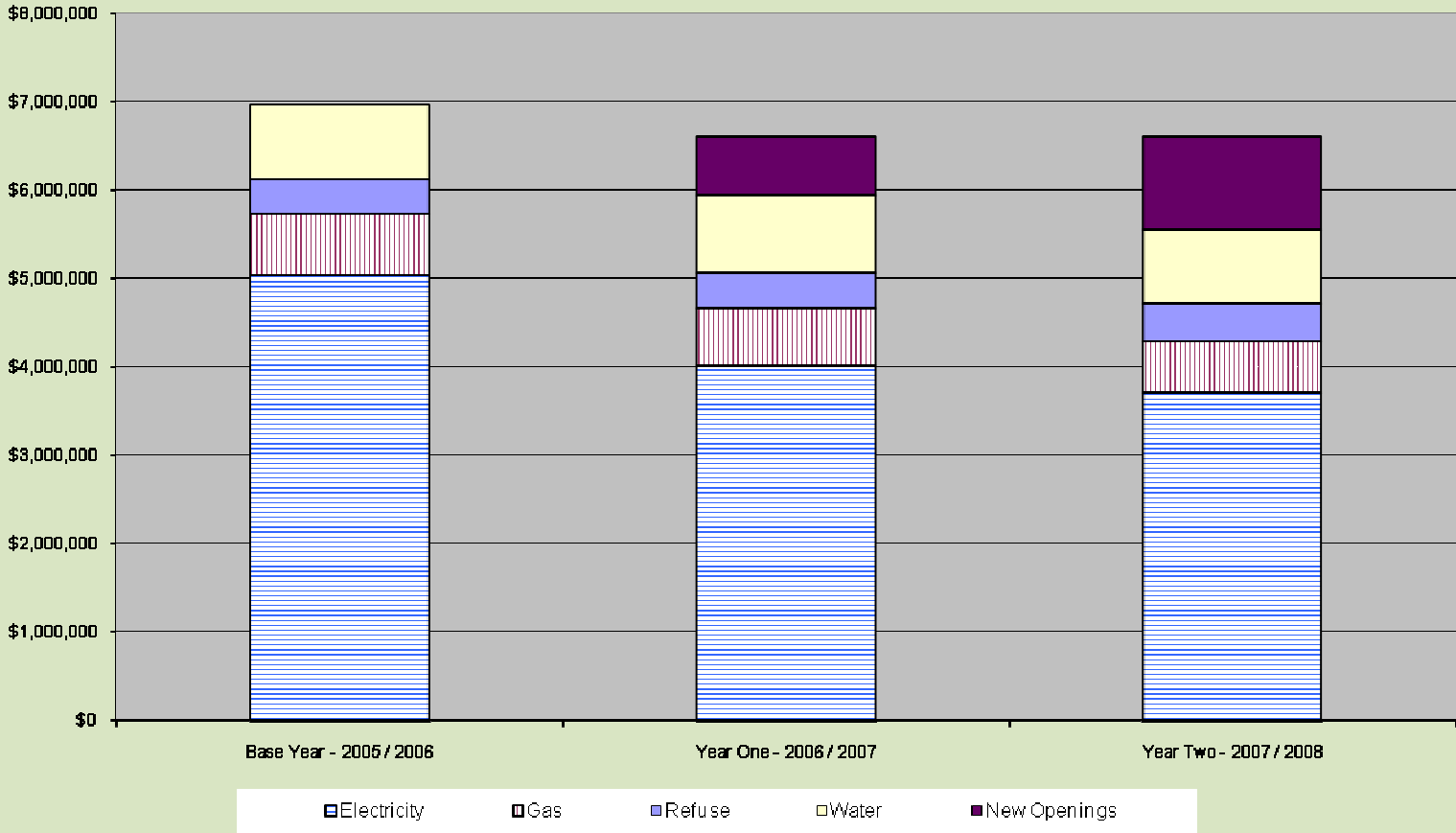
(Estimated Annual Savings Below)

- Changed electric utility providers on deregulated campuses (Crownover and Hawk). \$75,000
- Installed energy management controls on portable classrooms. \$35,000
- Retrofitted lighting fixtures at DHS and RHS. \$80,000
- Retrofitted light fixtures in older elementary school gymnasiums. \$17,000
- Converted FMHS to Direct Digital Control. \$2,500
- Converted Central Services to Direct Digital Control. \$1,000
- Added additional EMS controls at DHS & RES. \$2,400

## Accomplishments (continued)

- Replaced inefficient and worn out water heating systems at DHS, RHS, CMS & SMS.
- Replaced inefficient and worn out heating boilers at CMS and EES.
- Replaced inefficient and worn out HVAC units at DHS, CMS, FMHS, RES and Central Services.
- Eliminated the pneumatic control air supply system at CMS. \$1,000
- Attended TASB Benchmarking Seminar to learn from other districts.

# Total Cost Comparison



## Summary

- Total utility savings:
  - \$1,364,749 over base year
  - \$382,591 over year one
- New openings utilities cost \$1,043,158  
(Savannah ES, Navo MS, ATC, PDC, Paloma ES & Nelson ES)
- Net utility savings:
  - \$321,591 over base year
  - \$585** over year one
- Total spend for electricity, gas, water, sewer and refuse service \$6,594,647

## Analysis of Utility Type (not including new Openings)

### Electricity:

- Unit cost (rate) decreased 5.8% from year one
- Consumption decreased 2% from year one
- 4.4% more cooling degree days than in year one
- Net decrease in dollars:

\$1,362,575 over base year

\$ 310,321 over year one

Note: The DMC's Energy Cost Adjustment was increased to .060 in June, 2008 which will cause an overall unit cost increase this year.

## Analysis of Utility Type (not including new Openings)

### Gas:

- Unit cost (rate) increased 8% over year one
- Consumption decreased 15.6% over year one
- 2.1% less heating degree days than in year one
- Net decrease in dollars:

\$97,875 over base year

\$57,948 over year one

## Analysis of Utility Type (continued)

### Water:

- Unit cost (rate) increased 11% over year one
- Consumption decreased 8.6% over year one
- Net decrease in dollars:

\$33,481 over base year

\$37,116 over year one

### Refuse:

- Net increase in dollars: of \$22,794



## Campuses with the largest decrease in Energy Use

- Hawk Elementary -55%
- Ryan High -18%
- Evers Elementary -18%
- Strickland Middle -14%
- Lee Elementary -12%
- Crownover Middle -12%
- McMath Middle -9%

## Campuses with the largest Increase in Energy Use

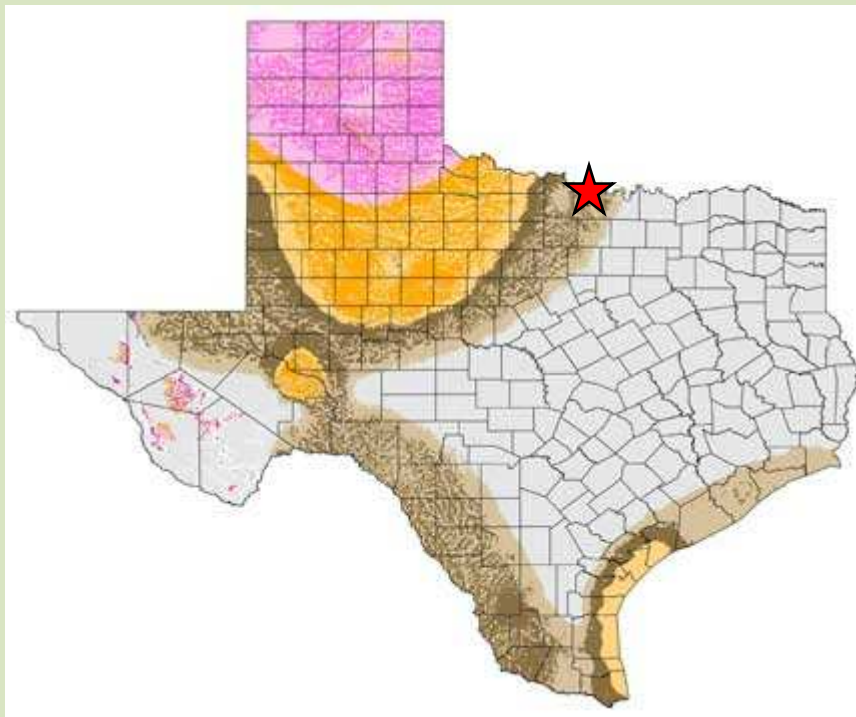
- Pecan Creek Elementary +10%
- Fred Moore HS +10%
- Ginnings Elementary +10%
- Hodge Elementary +10%
- EP Rayzor Elementary +8%
- Rayzor Elementary +7%
- Rivera Elementary +4%

## Looking Forward

(Estimated Annual Savings Below)

- Continue to tightly manage building operation through the use of information and the EMS/Control System (4,500 Pieces of HVAC Equipment).
- Phase two of lighting retrofits. \$111,000
- Elimination of additional pneumatic control supply systems at older campuses. \$7,000
- Initiatives to address water usage and waste.
- Evaluation and potential recommendation of Solar, Wind and Geothermal applications.
- Evaluate real time monitoring of key utility meters to shorten the reaction time to increased usage.
- Evaluate utility costs on sq. ft. based on run time.

# Looking Forward – Wind Opportunities



Wind Power Classification

W/m <sup>2</sup>	Class
<100	1
100 - 200	1.5
200 - 250	2
250 - 300	2.5
300 - 350	3
350 - 400	3.5
400 - 450	4
450 - 500	4.5
500 - 550	5
550 - 600	5.5
600 - 650	6
650 - 700	6.3
700 - 750	6.6
750 - 950	7+

Denton  
County

- Class 4 and above are considered good resources. Denton County is Class 2 – 2.5.
- Costs for site-based generation can run from \$3000 / \$4000 per kW depending on site conditions and local regulatory requirements.
- Research on Denton Municipal Coop's acceptance / availability of net metering required.

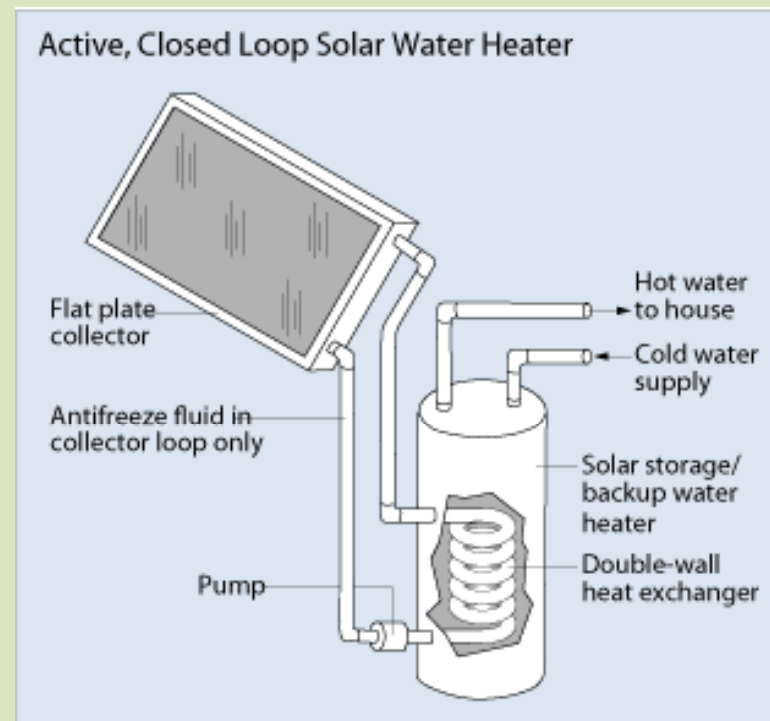
## Looking Forward – Photovoltaic Opportunities



75 Watt Installation at  
Dulce High School, NM

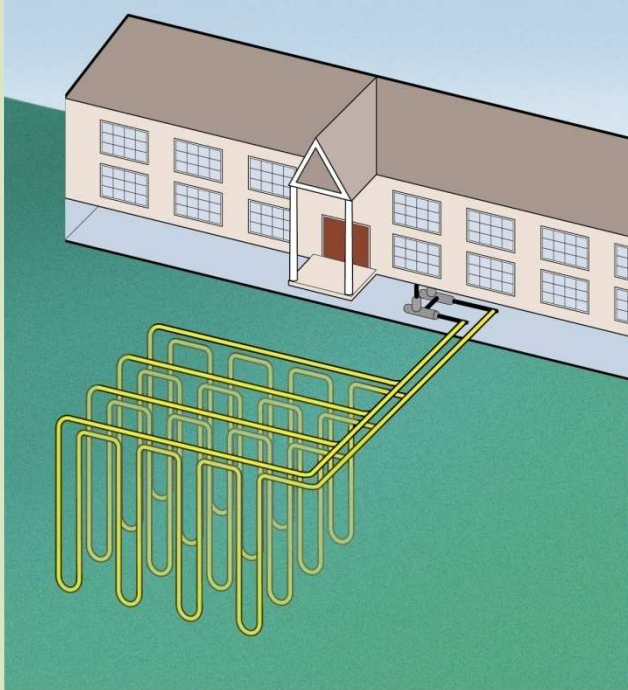
- **Cost per kWh is dropping, but still higher than purchased power**
- **PV is heavily subsidized in some States, i.e. California where rebate programs make projects attractive.**
- **Installations dependent on site conditions and local regulatory requirements, i.e. structural, battery space, etc.**
- **Research on Denton Municipal Coop's acceptance / availability of net metering required.**

## Looking Forward – Solar DHW Opportunities



- Feasible for Domestic Hot Water generation in high-use facilities
- Collectors, Equipment & control systems much improved over the last decade
- Installations dependent on site conditions and local requirements, i.e. structural, building orientation, etc.

## Looking Forward – Geothermal Heat Pump



- Highly Efficient
- Adds Potentially 20% to HVAC Installation Cost
- Birdville ISD
- Frisco ISD
- Lake Dallas ISD
- Aledo ISD
- Eagle Mountain – Saginaw ISD
- Grand Prairie ISD
- Gainesville ISD
- Keller ISD
- Austin ISD & Many More

### Plus:

- **No Rooftop / Ground Mounted Equipment Waiting for Hail Storms, etc**
- **Cleaner Site / Building Lines, Less Roof Penetrations**
- **Increased Indoor Air Quality control.**
- **Increased Humidity Control ~ 50% More Moisture Removal Capability.**
- **Longer equipment life.**

# Frisco ISD Middle School Cost Comparison 2005 – 2006 Cost / Sq. Ft.

