



# SFASU – Faculty Senate Government and Involvement

## Committee

Dr. Neill Armstrong

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# University Sustainability: Energy Stewardship





# Rationale

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- ❏ The University administration has invited the faculty to participate in the formulation of a university energy plan.
- ❏ We feel this represents a legitimate effort to enlist faculty support and input in an issue that has great meaning at the international, national, state, and local level.
- ❏ In light of President Obama's recent commitment to pursue a national energy policy that will ultimately lead to our nation's independence from foreign energy sources, it seems timely and, likewise, meaningful that SFA would choose to embark on a campus-wide plan to conserve energy and develop a formal structure for managing energy consumption and use.
- ❏ Our initial task was gather data from the faculty as a means to "test the waters" and gauge support as we move forward in this process.





# Faculty Survey

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- 5 closed-ended questions

- 2 open-ended questions

- 21.9% response rate

Of the 715 faculty (full- and part-time), 157 participated in the survey.





# Faculty Survey Responses (Closed-ended)

## Support or not support?

- ✎ Lowering the hot water temperature in public facilities on campus?  
139 support (88.5%) / 16 not support (10.1%)
- ✎ Specific hours of heating/air conditioning operation per building on campus?  
78 support (49.7%) / 75 not support (47.8%)
- ✎ A university policy that mandated computers are to be powered off when not in use?  
91 support (57.9%) / 64 not support (40.7%)
- ✎ A university policy restricting additional electrical usage of refrigerators, heaters, etc., in your office?  
41 support (26.1%) / 114 not support (72.6%)
- ✎ A 70/74 degree set point for winter/summer heating and air conditioning as a general university policy?  
115 support (73.3%) / 37 not support (23.5%)





# Faculty Survey Responses (Open-ended)

What ideas do you have for curtailing heating/cooling/lighting costs at SFA?

112 responses – 13 emergent themes

**Conservation (46):** use less, consume less of power/equipment/fuel

**Minimization (39):** strategy of reducing scope equipment or system use

**Energy Saving Devices (31):** installation of multiple devices to shut off, control, or regulate energy-related equipment

**Optimization (29):** replacement of old energy consuming systems or equipment with energy efficient systems and /or repairing inefficient, low or malfunctioning equipment/systems

**Awareness (22):** educating personnel to take responsibility for energy-saving measures

**Go “Greener” (17):** plan for/install / employ energy saving technology & construction that is sustainable or organic

**Shorten Work Week/Amend Work Habits (14):** reorganize work day to reduce energy demand and/or alter work habits, e.g. more on-line at home work

**Innovation (12):** investigate creative energy-saving, sustainable systems via thinking outside the box

**Policy Change (10):** Change University’s operating procedures, temperature / water settings, work habits

**Conduct Energy Audit (5):** invite or hire outside entities to conduct campus-wide energy use audit

**Fleet Fuel Management & Departmental Competition (2):** review policies and practices involving University vehicle operation

**Analyze/Review Library Use (1):** analyze library’s use, hours of operation, and energy consumption patterns

**Departmental Competition (2):** faculty / staff engage in competitive conservation efforts with other departments (financial incentives)





# Faculty Survey Responses (Open-ended)

What ideas do you have for curtailing heating/cooling/lighting costs at SFA on nights and weekends?

**56 responses – 14 topics of concern/4 emergent themes**

**More thermostat variation (28): 50%**

**Concern about thermostat variation (13):**

23%

**Turning-off lights (19): 34%**

**Lights too bright (1): 2%**

**Computers, other equipment (7): 13%**

**Doubts about shutting-off equipment (4):**

7%

**Limit hours of operation (3): 5%**

**Against limited access (3): 5%**

**Solar panels (2): 4%**

**Insulated windows (1): 2%**

**Instant-on hot water (1): 2%**

**Promote modified dress (1): 2%**

**Consolidate night/weekend courses (1):**

2%

**Disallow space heaters (1): 2%**

## THEMES

**Optimize (37): 66%**

**Energy-saving devices (13):**

23%

**Policy change(6): 11%**

**Go “Greener”(2): 4%**





# Three Energy Objectives

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- ❏ Reliability – the assurance of meeting the current and future energy demands in order to provide for continued operation of all university business and the avoidance of costly interruptions. Meeting this objective entails informed investment in physical plant capacity and renewal, redundancy, and system integrity (University of Iowa, 2007).
- ❏ Conservation – reduction of energy consumption for all owned, conditioned facilities, to include: investment in energy-related staffing; building control systems; and conservation and efficiency projects (University of Iowa, 2007).
- ❏ Sustainability – the evolutionary process of advancing the university-related consumptive profile along the continuum of non-renewable to renewable energy sources. Renewable energy sources include solar, wind, waste management, resource recovery, refuse-derived fuel, biomass, wood-burning, micro hydro and other carbon neutral sources.





# Theme-to-objective profile

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- What ideas do you have for curtailing heating/cooling/lighting costs at SFA?

Reliability: 7.6%

Conservation: 76.9%

Sustainability: 15.3%

- What ideas do you have for curtailing heating/cooling/lighting costs at SFA on nights and weekends?

Reliability: 20%

Conservation: 77%

Sustainability: 13%







# Overall Response/Questions

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- ❏ Most faculty seem to support more energy efficiency across campus, unless it restricts their personal freedom to work or do their jobs when/and where they will or must.
- ❏ According to the State Facilities Management Program, the SECO (State Energy Conservation Office) required state agencies and public higher education institutions to implement all cost-effective energy and water conservation measures possible by September 2006. To help these entities develop their Resource Efficiency Plan, SECO provided guidelines, model documents, templates and electric reporting systems. Did SFA develop a Resource Efficiency Plan? Is that plan available to the Faculty Senate
- ❏ The Loan STAR Revolving Loan Program finances energy-efficiency projects for state agencies, institutions of higher education, school districts, county hospitals and local governments. Borrowers repay loans through cost savings generated by the projects. Is this loan program still in operation and if so, has SFA engaged in a loan with them? If not, is this a funding option the University would be willing to investigate?
- ❏ Lee Brittain, SFA Director of Physical Plant





# Proposed Energy Conservation Measures

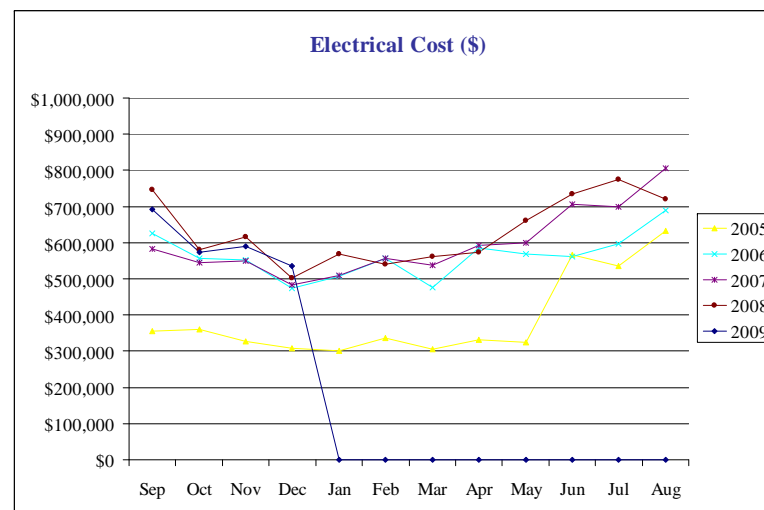
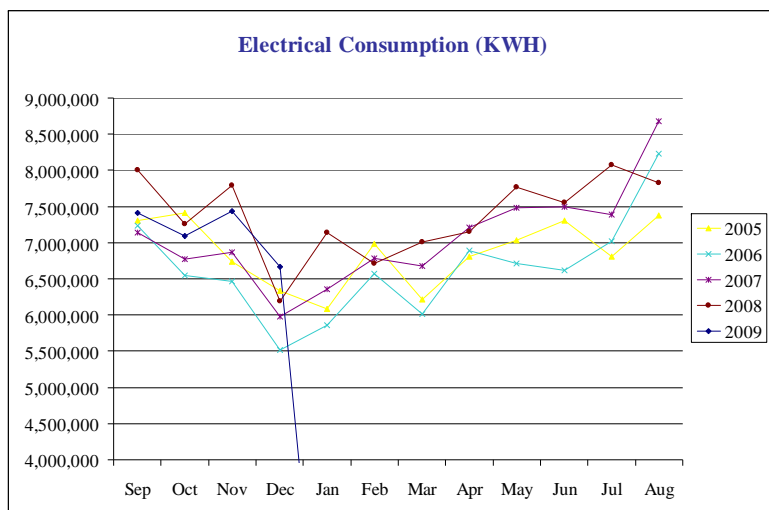
Bldg #	Building Name	Year Built	Square Footage	Proposed Project Summary									Cumulative Figures		
				Upgrade Lighting Fixtures			Install Lighting On/Off Sensors			Install Energy Efficient Motors			Cost	Annual Savings	Payback / Yrs
				Cost	Annual Savings	Payback / Yrs	Cost	Annual Savings	Payback / Yrs	Cost	Annual Savings	Payback / Yrs			
101	Austin Administrative	1924	40,963				\$ 16,950	\$ 4,044	4.19				\$ 16,950	\$ 4,044	4.19
102	Rusk Building	1926	42,332				\$ 20,550	\$ 4,399	4.67				\$ 20,550	\$ 4,399	4.67
103	Chemistry Building	1938	26,759	\$ 10,535	\$ 1,563	6.74	\$ 10,950	\$ 2,815	3.89	\$ 1,911	\$ 535	3.57	\$ 23,396	\$ 4,913	4.76
106	Forestry Labs	1949	9,342	\$ 7,394	\$ 1,351	5.47	\$ 4,950	\$ 811	6.10	\$ 1,798	\$ 77	23.35	\$ 14,142	\$ 2,239	6.32
109	Griffith Fine Arts	1959	63,355	\$ 15,825	\$ 4,029	3.93	\$ 20,250	\$ 1,209	16.75				\$ 36,075	\$ 5,238	6.89
110	Military Science	1965	5,552	\$ 6,084	\$ 304	20.01	\$ 3,300	\$ 1,052	3.14				\$ 9,384	\$ 1,356	6.92
113	Agriculture Mechanics Shop	1963	9,200	\$ 5,564	\$ 707	7.87	\$ 4,350	\$ 956	4.55				\$ 9,914	\$ 1,663	5.96
114	Shelton Gym	1950	28,264	\$ 7,856	\$ 1,899	4.14	\$ 5,100	\$ 1,850	2.76	\$ 5,083	\$ 1,150	4.42	\$ 18,039	\$ 4,899	3.68
120	Kennedy Auditorium	1968	14,268	\$ 5,416	\$ 404	13.41	\$ 900	\$ 202	4.46				\$ 6,316	\$ 606	10.42
121	Miller Science	1968	144,550				\$ 53,850	\$ 10,140	5.31	\$ 15,874	\$ 5,291	3.00	\$ 69,724	\$ 15,431	4.52
122	Ferguson Building	1969	75,000	\$ 39,381	\$ 7,958	4.95	\$ 32,850	\$ 5,260	6.25	\$ 13,486	\$ 4,160	3.24	\$ 85,717	\$ 17,378	4.93
123	Human Sciences - North	1970	18,592	\$ 9,828	\$ 1,543	6.37	\$ 8,550	\$ 2,174	3.93	\$ 1,279	\$ 219	5.84	\$ 19,657	\$ 3,936	4.99
124	Wright Music	1970	59,105				\$ 27,300	\$ 2,764	9.88				\$ 27,300	\$ 2,764	9.88
131	Art Building	1982	33,110	\$ 18,768	\$ 3,087	6.08	\$ 17,775	\$ 4,697	3.78	\$ 6,310	\$ 1,344	4.69	\$ 42,853	\$ 9,128	4.69
132	Art Studio	1942	14,550	\$ 10,038	\$ 970	10.35	\$ 5,400	\$ 2,580	2.09	\$ 3,160	\$ 572	5.52	\$ 18,598	\$ 4,122	4.51
136	Boynton Building	1957	41,703	\$ 17,807	\$ 4,332	4.11	\$ 19,350	\$ 10,387	1.86	\$ 4,503	\$ 1,053	4.28	\$ 41,660	\$ 15,772	2.64
137	Forestry Building	1970	51,695	\$ 25,466	\$ 4,189	6.08	\$ 24,150	\$ 5,372	4.50	\$ 6,042	\$ 4,584	1.32	\$ 55,658	\$ 14,145	3.93
139	Stone Fort	1936	5,060	\$ 3,194	\$ 1,048	3.05							\$ 3,194	\$ 1,048	3.05
146	Steen Library	1973	237,469	\$ 193,654	\$ 35,254	5.49	\$ 9,900	\$ 1,480	6.69	\$ 27,578	\$ 8,291	3.33	\$ 231,132	\$ 45,025	5.13
147	Norton HPE	1974	113,293	\$ 33,340	\$ 9,406	3.54	\$ 7,800	\$ 424	18.40	\$ 3,606	\$ 1,019	3.54	\$ 44,746	\$ 10,849	4.12
148	McGee Business	1974	89,569	\$ 59,441	\$ 9,274	6.41	\$ 43,800	\$ 6,283	6.97	\$ 18,017	\$ 5,510	3.27	\$ 121,258	\$ 21,067	5.76
149	McKibben Education	1974	89,569	\$ 53,801	\$ 9,903	5.43	\$ 45,450	\$ 6,283	7.23	\$ 19,743	\$ 6,033	3.27	\$ 118,994	\$ 22,219	5.36
152	Early Childhood Laboratory	1975	31,469	\$ 15,753	\$ 2,767	5.69	\$ 14,850	\$ 3,924	3.78	\$ 3,714	\$ 814	4.56	\$ 34,317	\$ 7,505	4.57
153	University Police Department	1976	6,088	\$ 5,292	\$ 1,900	2.79	\$ 2,850	\$ 2,742	1.04				\$ 8,142	\$ 4,642	1.75
154	Agriculture Building	1977	23,009	\$ 13,844	\$ 2,160	6.41	\$ 10,350	\$ 2,929	3.53	\$ 5,448	\$ 1,494	3.65	\$ 29,642	\$ 6,583	4.50
158	Human Sciences - South	1981	11,020	\$ 8,779	\$ 1,686	5.21	\$ 6,000	\$ 1,288	4.66				\$ 14,779	\$ 2,974	4.97
160	Forestry Greenhouse	1982	8,200	\$ 2,368	\$ 344	6.88	\$ 4,200	\$ 257	16.34	\$ 1,531	\$ 153	10.01	\$ 8,099	\$ 754	10.74
161	Nursing & Math	1983	70,177	\$ 27,284	\$ 1,366	19.97	\$ 20,250	\$ 2,998	6.75	\$ 12,352	\$ 2,674	4.62	\$ 59,886	\$ 7,038	8.51
162	Vera Dugas Liberal Arts	1984	55,517	\$ 17,364	\$ 3,369	5.15	\$ 37,500	\$ 4,923	7.62	\$ 1,871	\$ 530	3.53	\$ 56,735	\$ 8,822	6.43
163	Motor Pool Building	1984	13,500	\$ 2,300	\$ 365	6.30	\$ 1,500	\$ 91	16.48				\$ 3,800	\$ 456	8.33
526	Housing Operations Annex	1971	3,000	\$ 3,154	\$ 233	13.54	\$ 1,350	\$ 592	2.28				\$ 4,504	\$ 825	5.46
527	Stadium Field House	1972	22,476	\$ 8,650	\$ 1,736	4.98	\$ 8,550	\$ 3,679	2.32				\$ 17,200	\$ 5,415	3.18
532	Johnson Coliseum	1974	93,214	\$ 13,632	\$ 1,040	13.11	\$ 9,150	\$ 260	35.19	\$ 10,392	\$ 2,988	3.48	\$ 33,174	\$ 4,288	7.74
534	Health Services	1978	11,200	\$ 6,639	\$ 949	7.00	\$ 7,800	\$ 943	8.27	\$ 2,907	\$ 622	4.67	\$ 17,346	\$ 2,514	6.90
<b>Totals</b>				\$ 648,451	\$ 115,136	5.63	\$ 507,825	\$ 99,808	5.09	\$ 166,605	\$ 49,113	3.39	\$ 1,322,881	\$ 264,057	5.01

**Notes:** Potential Energy Conservation Initiatives are not listed in the 10-year plan.  
 All Figures are based on 2006 estimates from Friberg Associates, Inc., an engineer consulting firm. Information provided by SFASU was instrumental in determining calculation variables.  
 Saving figures represent potential savings based on 2006 rates and specific building hours of operation.  
 Electricity calculations based on a cost of \$.0866 / KWH; Gas calculations based on a cost of \$12.00 / MCF .  
 The data contained on this worksheet is not tied to the file in any way.





# Electrical Consumption

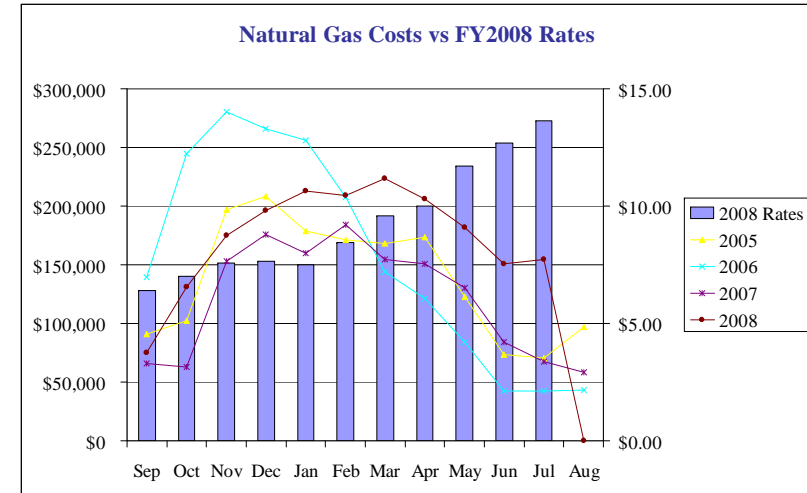
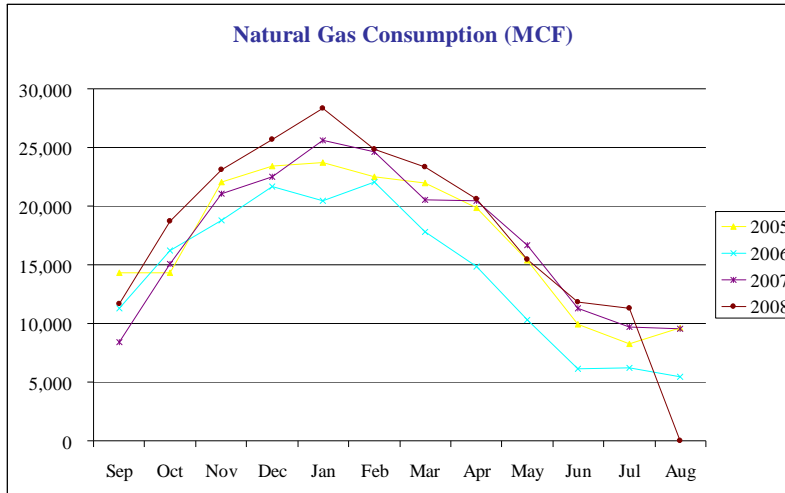


- ❏ Electrical consumption and costs have been compiled and back to 2005, including main campus and all peripheral buildings.
- ❏ 2008 July and August data was incomplete and therefore not included above.
- ❏ Currently teamed with the Texas A&M system, SFASU is under contract with TXU for electricity until 2013.
- ❏ Historical square foot data is being compiled in order to benchmark both usage and cost ratios for year over year comparison purposes.





# Natural Gas Consumption

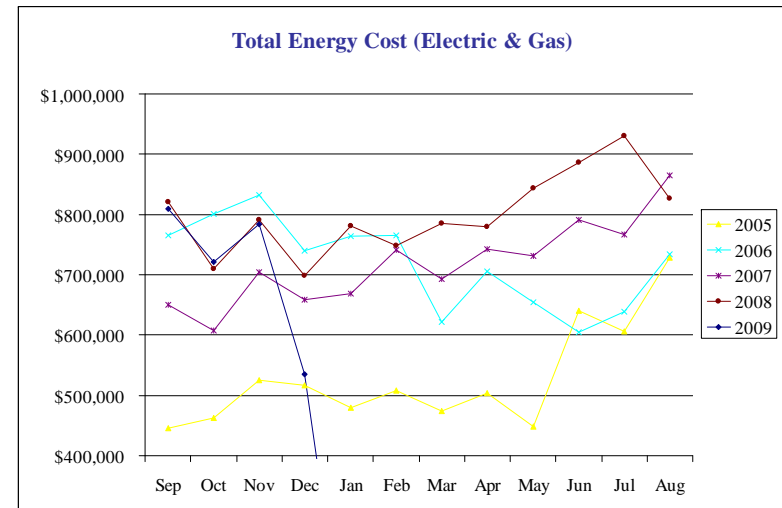
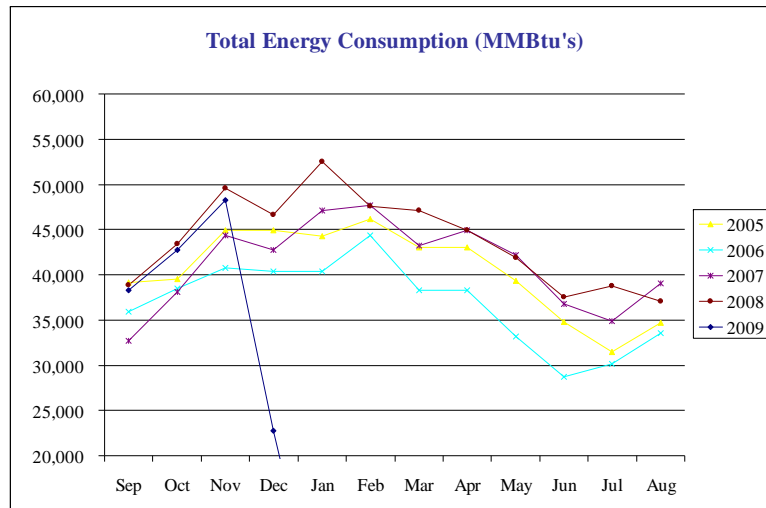


- ☛ Natural gas consumption and costs have been compiled and back to 2005, including main campus and all peripheral buildings.
- ☛ 2008 August data was incomplete and therefore not included above.
- ☛ SFASU is under contract with CenterPoint for gas through August, 2009.
- ☛ Rates are shown above to show dramatic increase during 2008.
- ☛ Historical square foot data is being compiled in order to benchmark both usage and cost ratios for year over year comparison purposes.





# Total Energy Consumption (MMBtu's)

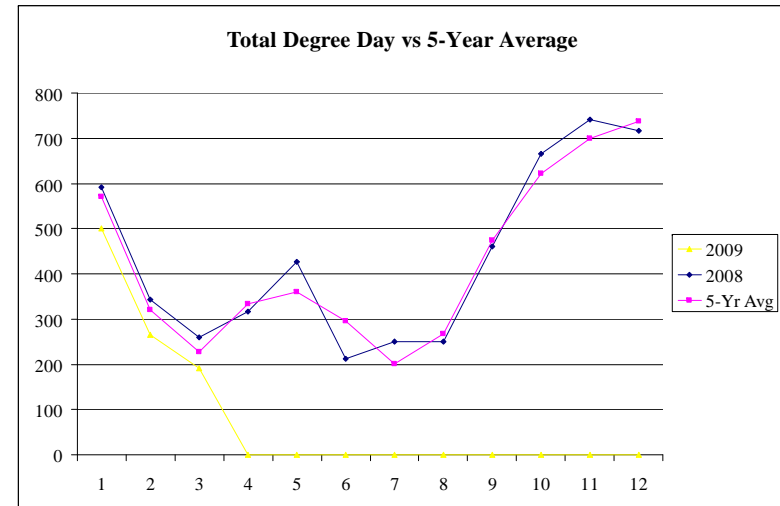
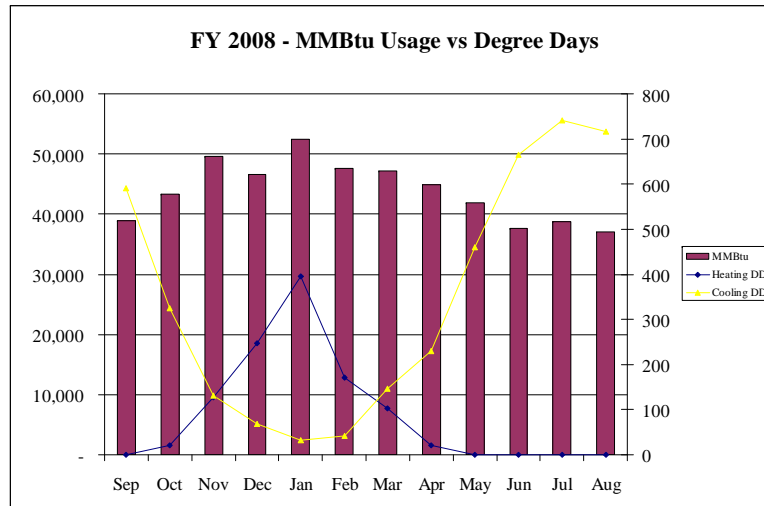


- ☛ Total energy figures include all electrical and natural gas usage and cost data.
- ☛ 2008 July and August data was incomplete and therefore not included above.
- ☛ Electrical and gas data is converted to BTU's, a common energy unit.
- ☛ The MMBtu (equal to one million Btu's) is the standard used for benchmarking to other institutions.
- ☛ Historical square foot data is being compiled in order to benchmark both usage and cost ratios for year over year comparison purposes.





# Heating & Cooling Degree Days

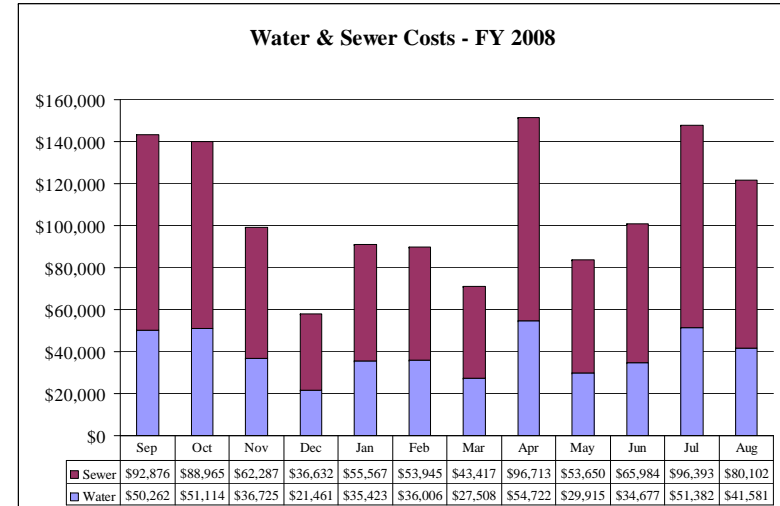
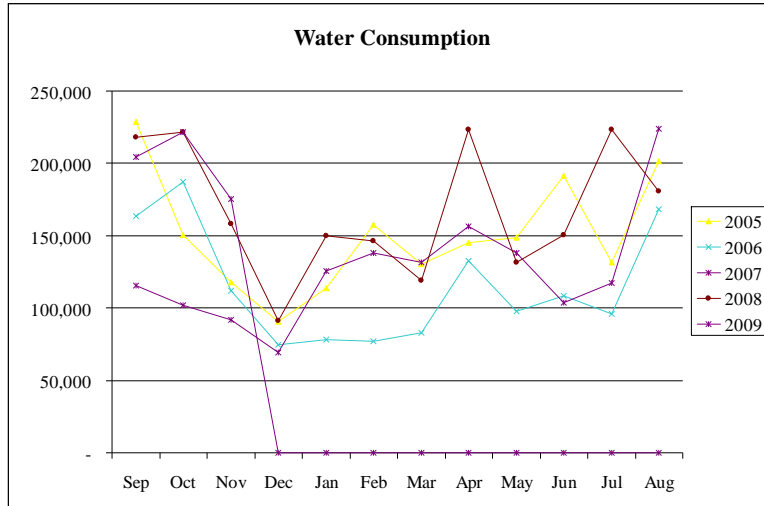


- ☛ Total energy figures include all electrical and natural gas usage and cost data.
- ☛ 2008 July and August data was incomplete and therefore not included above.
- ☛ The number of heating and cooling degrees in a day is defined as the difference between a reference value (60°F was used) and the average outside temperature for a particular day.
- ☛ The degree day data shown represents the sum of each day's data for the particular month.
- ☛ Degree Day data was compiled from Lufkin, the closest source available.





# Water & Sewer



- ☛ Consumption shown in 1,000's of gallons.
- ☛ 2008 August data was incomplete and therefore not included above.
- ☛ Efforts will be made in the future to decrease sewer costs by installing meters on cooling towers (both supply and blow down) and landscape irrigation systems
- ☛ Historical square foot data is being compiled in order to benchmark both usage and cost ratios for year over year comparison purposes.

