The Angelo State University Energy Savings Update is being submitted in accordance with Governor’s Executive Order, RP 49, Energy Conservation by State Agencies.

1. Energy Goals
	* 1. Campus Energy Use

Energy units are converted to kBtu to allow for comparisons of electricity and natural gas usage. Goals and energy use are then stated in kBtu/sq ft. Estimated savings are based on energy consumption for the same time period from the previous year normalized to current energy costs and campus square footage. It does not take into consideration the climate difference between periods.

In the fiscal year for 2008 the entire campus used 86.5 kBtu/Sq Ft. That was a decrease of 17% from the previous year with an estimated savings of $376,612.81. The savings is even greater if the fact that FY08 was a hotter and dryer year than FY07, thus increasing the demand on electricity, was considered.

In Table I, the campus energy use is broken down by utility type. The percent change column is the energy usage change from fiscal year 2007 to 2008.

 Table I: Campus Energy Use (kBtu/Sq ft): FY2006-FY2008

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Utility | FY06 | FY07 | FY08 | % Change | Est. Savings |
|  Electricity | 71.3056 | 64.9719 | 62.6497 | Down 3.57% |  $ 133,205.12  |
|  Nat. Gas | 41.1805 | 39.5364 | 23.8601 | Down 39.65% |  $ 243,407.69  |
|  Total | 112.4861 | 104.5083 | 86.5098 | Down 17.22% |  $ 376,612.81  |

In Table II, the campus energy is broken down to compare only the fourth quarter of FY 2008 to the same time the previous year. The low usage in natural gas usage is due to the energy efficient improvements at the Central Plant. The plant was shut down for July & August 2007, but running the entire time in 2008. The third quarter of FY08 had a 6.25% decrease in total usage as compared to FY07.

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| Table II: Campus Energy Use (kbtu/sq ft): June – August For the Fourth Quarter of the Fiscal Year |
| Utility | FY 2007 | FY 2008 | % Change | Est. Savings |
| Electricity | 16.12 | 15.61 | Down 3.16% | $29,115.02 |
| Nat. Gas | 3.23 | 2.53 | Down 21.67% | $11,080.54 |
| Total | 19.35 | 18.14 | Down 6.25% | $40,195.56 |

* + 1. House Bill 3693

In Compliance with House Bill 3693, Angelo State University set a goal to reduce total electrical consumption by 2.5% for Fiscal Year 2008. Table III below shows the kilowatt hours per square foot for the entire campus quarterly. This is all electrical usage whether it is in a building or on the grounds. It shows a reduction of just over 4% in electrical consumption for Fiscal Year 2008. It also shows almost a 10% reduction from Fiscal Year 2006 to 2008.

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| Table III: Entire Campus Electricity Usage in kwh/sq ft |
| Fiscal YearQuarter | FY 2006 | FY 2007 | FY 2008 | % change from previous year |
| 1st Qtr | 5.60 | 5.27 | 5.00 | Down 4.98% |
| 2nd Qtr | 5.04 | 4.65 | 4.36 |  Down 6.28% |
| 3rd Qtr | 4.96 | 4.40 | 4.38 | Down 0.41% |
| 4th Qtr | 4.70 | 4.77 | 4.57 | Down 4.11% |
| Yearly Total | 20.29 | 19.09 | 18.32 | Down 4.02% |

* + 1. Fleet Management

In FY2006 the Angelo State University vehicle fleet consumed 20,311 gallons of fuel and traveled 245,217 miles.  In FY2007 Angelo State University consumed 23,580 gallons of fuel and traveled 272,780. This represented a 4% decrease in the fuel efficiency of the fleet bringing the miles per gallon to 11.56.

Angelo State University had been at 12.1 miles per gallon the previous year and acknowledges the decrease. It is felt that the acquisition of an off site sports complex figured significantly into the drop. The large truck that was used to constantly transport grounds equipment to that facility and the off site agricultural management, instruction and research center was one of the oldest vehicles on the fleet. A new 1 ton vehicle has been purchased at started use in November 2007 to hopefully correct that issue.

In Table IV the vehicle fleet is broken down by number of vehicles, miles driven, gallons used, cost of those gallons, cost per mile and miles per gallon for fiscal years 2006 thru 2008.

Table IV: Fleet Vehicle Usage: FY2006 - FY2008

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Vehicles | Number | Miles | Gallons | Cost | Cost PerMile | Miles PerGallon |
| FY2006 | 58 | 245,217 | 20,311 | $51,113 | $0.2084 | 12.0731 |
| FY2007 | 61 | 272,780 | 23,580 | $57,770 | $0.2118 | 11.5683 |
| FY2008 | 60 | 298,905 | 25,318 | $81,288 | $0.2720 | 11.8060 |

At the end of FY2008 there were 60 vehicles in the university’s fleet. Over half of the fleet is 9 years old or older. 16 of the vehicles are 5 years old or newer with 7 of them being 2007 models or newer. As the university continues to replace older vehicles and use electric carts for simpler tasks the efficiencies will increase. Table V below shows the historical efficiency in miles per gallon during each quarter of the fiscal year for the fleet.

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| Table V: Historical Efficiency of Vehicle Fleet in MPG |
| MPG | 1st Qtr | 2nd Qtr | 3rd Qtr | 4th Qtr | Annual |
| FY06 | 12.6 | 11.2 | 11.7 | 12.8 | 12.1 |
| FY07 | 11.6 | 10.7 | 11.8 | 12.1 | 11.6 |
| FY08 | 11.9 | 12.0 | 12.4  | 12.1 | 11.8  |

B. Current Energy Reduction Plans

1. Campus Energy Use
	1. Continue the various upgrades/replacements to air handlers, electrical equipment and items at the central plant as according to the performance contract Angelo State University has with Tour Andover Controls (TAC). This is a $13 million dollar energy savings project for the university that is to be paid over the next 15 years with the money saved from the improvements. The installations started in late 2006 and are now scheduled to be completed by November 2008.
	2. TAC has already finished retro fitting the outdoor lighting and building lighting across campus to more efficient fixtures and bulbs. They replaced faucets, showers, and toilets to low flow models. They also replaced some of the boilers and chillers for the central plant. These changes are showing significant reductions in our usages.
2. Fleet management
	1. Improve overall fuel efficiency of fleet vehicles by replacing older, inefficient vehicles with newer, more efficient vehicles. By the end of FY2008, Angelo State University acquired two new, more efficient vehicles bringing the total of vehicles that are 6 years old or newer to 33% of the entire fleet. ASU also salvaged 3 of the older vehicles.
	2. Continue the aggressive Preventative Maintenance program to maintain all vehicles at their peak efficiency. In June of 2007 the onsite garage was closed and all maintenance was taken off site to be performed by local vendors. It was determined to be more efficient both fiscally and timely to use commercial repair centers than in house due to the equipment and certification needed. After 5 months of having this in place it has become noticeable by the amount of open work orders that the vehicles are being serviced in a timelier manner.
	3. Continue to utilize the State’s Fleet Data Management System. The Fleet Management office will continue to use the Fleet Focus database to monitor vehicle utilization, efficiency, maintenance and accuracy of vehicle reporting.  Any discrepancies will immediately be addressed with appropriate vehicle custodians.
	4. Educate personnel on the efficient use of University vehicles. The Fleet Management office has informed all vehicle custodians of Governor Perry’s Executive Order and the university’s established goal of 12 mpg.
	5. At the end of FY2008 Angelo State University had 29 of the 48-volt carts for use by facilities technicians. There are 9 other carts that are used across campus by various departments to cut down on the use of the fleet vehicles. ASU already has newer carts on order that are more efficient and plans to continue expanding the usage of carts over gas powered vehicles in years to come.

C. Future Energy Reduction Plans

1. Continue gathering data and write a proposal on the efficiencies of installing wind turbines at Angelo State University’s Management, Instruction and Research Center to lower the costs of electricity.

2. Begin gathering data on the use of roof top solar cells for lowering the costs of electricity.

1. The continued infrastructure improvements under the performance contract with TAC.
2. Research having all the utility accounts audited by an outside firm.

D. Fuel Consumption Reduction Plans

1. The Fleet Management office will network with vehicle custodians to exchange information on vehicle efficiency and solicit additional best practices and other creative initiatives to improve the efficiency of the university vehicle fleet.
2. For all parties to encourage facility technicians and other departments to use electric carts when at all possible.
3. The Fleet Management office will continue to use off site shops to keep the vehicles in the best condition possible to increase fuel efficiency.
4. When funds are available acquire new vehicles and dispose of older less efficient ones.