

STATE OF UTAH



**ENERGY EFFICIENCY
INITIATIVE REPORT 2008**



STATE OF UTAH ENERGY EFFICIENCY INITIATIVE
ANNUAL REPORT TO THE GOVERNOR AND THE LEGISLATURE
2008

Prepared by
Salvador D. Petilos
Deputy Executive Director



Department of Administrative Services
3120 State Office Building
Salt Lake City, UT 84114
801-538-3010

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EXECUTIVE SUMMARY

Increasing energy efficiency is an important goal for the State of Utah. The Legislature's commitment to energy conservation as a means of reducing operating costs can be seen in the creation of the State Building Energy Efficiency Program (SBEEP) in the Quality Growth Act of 1999.¹ In 2006, Governor Jon Huntsman announced the state's official goal to increase energy efficiency 20 percent by 2015, and a number of directives in support of achieving the goal. Concurrently, legislation pertaining to energy and cost efficiency was passed by the Legislature. Together, the actions taken by Governor Huntsman and the Legislature articulate an understanding that improving energy efficiency can provide long-term economic and environmental benefits to the state.

Initial efforts to increase energy efficiency in response to the directives issued by both the Governor and the Legislature have focused on state-owned buildings and the state fleet. The programs and the benefits associated with them are:

- **lighting retrofit and re-commissioning projects to optimize energy efficiency in existing buildings**
 - direct project costs of \$1,883,905 are projected to yield utility cost saving of \$675,101 annually or \$10,126,515 over 15 years
 - reduce energy consumption by 11,138,280 kWh (kilowatt-hours) annually or 167,074,200 kWh over 15 years
 - reduce carbon emissions by 1,985 metric tons annually or 29,775 metric tons over 15 years
 - reduce carbon dioxide emissions by 7,275 metric tons annually or 109,125 metric tons over 15 years
 - remove the equivalent of 808 cars from the road for 15 years

- **five completed construction projects built to High Performance Building Design Standards**
 - direct project costs of \$594,640 are projected to yield utility cost savings of \$81,065 annually or \$1,621,300 over 20 years
 - reduce energy consumption by 1,224,425 kWh annually or 24,488,500 kWh over 20 years
 - reduce carbon emissions by 209 metric tons annually or 4,180 metric tons over 20 years
 - reduce carbon dioxide emissions by 766 metric tons annually or 15,320 metric tons over 20 years
 - remove the equivalent of 85 cars from the road for 20 years

¹ Chapter 24, laws of Utah 1999.

- **15 additional construction projects to be completed according to High Performance Building Design Standards**
 - direct project costs of \$5,890,809 are projected to yield utility cost savings of \$553,878 annually or \$11,077,560 over 20 years
 - reduce energy consumption by 6,787,628 kWh annually or 135,752,560 kWh over 20 years
 - reduce carbon emissions by 1,159 metric tons annually or 23,180 metric tons over 20 years
 - reduce carbon dioxide emissions by 4,247 metric tons annually or 84,940 metric tons over 20 years
 - remove the equivalent of 472 cars from the road for 20 years

- **purchase² vehicles with hybrid technology**
 - cost savings of \$83,350 annually or \$583,450 over seven³ years in fuel purchases⁴
 - save 33,340 gallons of fuel annually or 233,380 gallons of fuel over seven⁵ years
 - reduce carbon dioxide emissions by 296 metric tons annually or 2,072 metric tons over seven years
 - remove the equivalent of 32 cars from the road for seven years

- **downsize, or right-size, 85 vehicles**
 - save \$99,582 in additional capital outlay
 - cost savings of \$192,322 annually or \$1,346,254 over seven years in fuel purchases
 - save 76,900 gallons of fuel annually or 538,500 gallons of fuel over seven years
 - reduce carbon dioxide emissions by 682 metric tons annually or 4,774 metric tons over seven years
 - remove the equivalent of 76 cars from the road for seven years

The statewide effort to implement the energy efficiency policy and goal is coordinated through the Department of Administrative Services (DAS), the Governor's Energy Advisor, and the Department of Environmental Quality (DEQ). Important contributors to achieving success include the Judicial Branch, other departments and community based partners.

The annual State of Utah Energy Efficiency Initiative Report is a record of the work being done in government and higher education to improve energy efficiency and

¹ Requires \$1,300,000 approval for additional capital outlay in the 2008 General Session of the Legislature.

³ Extends the life of the vehicle by one year to offset the higher cost of the hybrid technology.

⁴ Assumes \$2.50 as the fuel cost per gallon over the seven year time period.

⁵ **For illustrative purposes only.** Most vehicles in the state fleet have a 90,000 mile replacement schedule. The 90,000 is translated to a 6 year life cycle for calculations to show consistency. Extending the life of the vehicle 15,000 miles or one year may be a viable means of offsetting the higher cost of vehicles with hybrid technology. DFO is currently analyzing several alternative replacement schedules to determine which is the most cost-effective without having a negative impact on safety.

reduce energy usage. The report is compiled DAS and is provided to the Governor, the Legislature and the public. This first report focuses on state agencies and details the start up and ongoing efforts to achieve energy savings over the next several years. Later editions will include information from higher education.

The state shows significant progress in this endeavor. The measures that agencies have instituted provide a solid foundation for the Energy Efficiency Initiative's long-term success.

The Division of Fleet Operations (DFO) and the Division of Facilities Construction and Management (DFCM) have, pursuant to statutory mandates, implemented a series of policies, programs and best practices that provide the State of Utah with the organizational structure needed to track and report on progress towards the state's energy efficiency goal. Additionally, the state is well on its way to establishing meaningful baseline data on energy consumption. Establishing baselines is critical to tracking progress towards a specific goal over time because it provides an indicator against which the state's progress can be compared on an annual basis.

The State Building Energy Efficiency Program (SBEEP) is in the process of gathering baseline data for FY (fiscal year) 2007. As a program within DFCM, SBEEP has access to information on all state-managed buildings. However, the state has over 3,000 buildings and only 190 are managed by DFCM. By June 2008, departments will report data on actual building square footage and the associated energy use and cost. Information will be loaded into the Environmental Protection Agency's Portfolio Manager and the baseline will be calculated. The baseline data for fleet is already available and includes data on cost per mile, total number of vehicles, total fuel dispensed, miles per gallon, and annual miles driven.

The methodology for measuring improvements in energy efficiency that was established in the "Utah Energy Efficiency Strategy: Policy Options" is used to measure the extent to which reductions in state government's energy consumption are contributing to the achievement of the state's energy efficiency goal. Accordingly, increasing energy efficiency 20 percent by 2015 is equivalent to a 16.7 percent (1-1/1.20) reduction in energy consumption. A 20 percent increase in energy efficiency does not translate to a 20 percent reduction in energy use.⁶

Energy savings is measured and communicated by using different methods. An easy way to demonstrate the energy savings is to use the number of cars removed from the road. For example, the energy saved from using high performance building standards can be measured by the equivalent annual measurement of numbers of vehicles removed from the road. The actual energy savings is measured in kilowatt-hours (kWh) and therms of natural gas. Through a conversion formula these measures are changed into British thermal units (Btu). From the Btu, emissions are derived and converted into the equivalent number of cars. The same type of conversion can be used for energy savings in vehicles. This simple measure is used by many states and combines numerous measures of energy savings into one easy way to show results.

⁶ Utah Energy Efficiency Strategy: Policy Options, October 2007. This report was created by the Southwest Energy Efficiency Project, Utah Clean Energy, and the American Council for an Energy-Efficient Economy, in partnership with state officials and other stakeholders.

State agencies are committed to achieving the state's energy efficiency goal. Agencies have responded to requirements that they submit annual plans to achieve energy savings. Plans support and encourage the following strategies:

- increase employee awareness and training on changing human behavior at work, while driving, and at home
- build, improve, and manage facilities more efficiently
- purchase highly efficient products and smaller more fuel efficient vehicles
- utilize alternative fuels and mass transportation
- implement agency specific programs

Internal estimates also show that despite limited funding, projects implemented in the early stages of the energy efficiency initiative are significantly contributing to the effort to increase energy efficiency 20 percent by 2015. Achievements to date, while sizeable, lag behind interim targets because of limited funding. Still, the \$2,428,500 invested by the state directly in the lighting retrofit and re-commissioning projects in existing buildings and in incorporating High Performance Building Design Standards in new construction projects completed to date is projected to yield \$11,747,800 in actual savings. These measures are projected to take the equivalent of 993 cars annually off the road during the useful life of the assets.

Increasing energy efficiency is an important goal for the State of Utah. However, the ability to reach the stated goal of increasing energy efficiency 20 percent by 2015 is, to a great extent, dependent on the amount of funding available. Projects that have been carried out by SBEEP show the critical role that funding will play in achieving the state's energy efficiency goal. The projects undertaken so far show that significant inroads toward its energy efficiency target will require the state to invest in making its facilities more energy efficient. State appropriations are required to fund personnel costs, investments in buildings, vehicles, and other energy programs. Nevertheless, current estimates also indicate that that the costs incurred by the state in implementing energy efficient measures will, over time, not only yield monetary benefits that outstrip costs of the project, but also significantly reduce emissions.

New funding will be required to implement new energy efficiency projects, but the state cannot rely solely on funding to reach the energy efficiency goal. DAS is working with the Governor's Office and the Legislature to increase funding to \$5,000,000 per year. Estimates indicate that this level of funding will help the state to achieve 15 percent energy efficiency by 2015 in state buildings only. The remaining five percent should come from other energy savings options or programs that include efforts to educate, train, and make employees aware of the critical role they play in meeting the state's energy efficiency goals.

BACKGROUND

This report is provided in response to policy directives from the Governor's Office and the Legislative Branch that officially established improving energy efficiency as a priority policy goal for the State of Utah. The directives acknowledge the high cost of energy and the many opportunities for improving energy efficiency. By granting priority to achieving the state's goal of "increasing energy efficiency 20 percent by 2015," the directives articulate the understanding that the state can realize long-term economic and environmental benefits by improving energy efficiency.

Policy Directives for Energy Efficiency in State Facilities

The state's current goal of "increasing energy efficiency by 20 percent by 2015," was issued by Governor Jon Huntsman on May 30, 2006, in Executive Order 2006-004.⁷ Designed to promote improved energy efficiency in state facilities and encourage collaboration and support of private-sector initiatives, the Executive Order specifically directs that:

- State employees sign up for PowerForward email alerts and adopt an ethic of energy conservation through simple electricity saving measures in the workplace and home
- State facility managers adopt practical conservation practices and procedures
- DEQ, in conjunction with electrical utilities, continue to provide simple and timely conservation alerts to consumers and businesses to help maintain affordable electricity rates and ensure system reliability
- Cabinet members submit annual reports to the Governor regarding their efforts to achieve the Governor's new goal
- DEQ prepare for the Governor's review a comprehensive annual report regarding the functioning of and responses to PowerForward within each State agency and regarding each agency's efforts to achieve the State's 2015 energy efficiency goal

Responsibility for preparing an annual report on agency efforts to achieve the State's 2015 energy efficiency goals under the Governor's Executive Order were transferred to DAS in September 2007 because two of its divisions, DFCM and DFO, were accorded central roles, by statute, in reporting on agency efforts to improve energy efficiency in state buildings and in state vehicles.

To help the state achieve the goal of increasing energy efficiency 20 percent by 2015, the Governor extended the goal statewide, encouraging community partners to adopt energy efficiency strategies in the workplace and at home. The Governor also established a Blue Ribbon Advisory Council on Climate Change (BRAC) to identify initiatives and changes to improve energy efficiency and reduce greenhouse gas emissions in all sectors of the economy. To consider the costs and benefits of these energy strategies, the Southwest Energy Efficiency Program (SWEEP) was charged with

⁷ APPENDIX A – Executive Order 2006-0004:Improving Energy Efficiency

the responsibility of evaluating Utah's proposed options, providing recommendations for implementation, and verifying the attainability of Utah's energy efficiency goal. The group provided 23 major policies, programs and initiatives to be implemented in order to accelerate improvements in energy efficiency in the State of Utah. The full report, *Utah Energy Efficiency Strategy: Policy Options*, is available at <http://www.utahcleanenergy.org>.

Directives focusing on energy efficiency in state facilities were created by the Utah State Legislature in amendments made to UCA §63-9-63⁸ and UCA §63-9-67⁹ during the 2006 General Session. With regard to energy efficiency in state facilities, the Legislature declared in UCA §63-9-63 that it is the policy of the state to:

- undertake aggressive programs to reduce energy use in state facilities in order to reduce operating costs of government and to set an example for the public
- utilize alternative funding sources and methods of financing to minimize state appropriations
- employ private sector management incentive principles
- develop incentives to encourage state entities to conserve energy, reduce energy costs, and utilize renewable energy sources where practical
- procure and use energy efficient products

Amendments to UCA §63-9-67(2) transferred responsibility over SBEEP to DFCM, and directed the division to:

- develop and administer the state building energy efficiency program, including guidelines and procedures to improve energy efficiency in the maintenance and management of state facilities
- provide information and assistance to state agencies in their efforts to improve energy efficiency
- analyze energy consumption by state agencies to identify opportunities for improved energy efficiency
- establish an advisory group composed of representatives of state agencies to provide information and assistance in the development and implementation of the state building energy efficiency program; and
- submit to the Governor and to the Capital Facilities and Administrative Services Appropriations Subcommittee¹⁰ an annual report that:
 - identifies strategies for long-term improvement in energy efficiency
 - identifies goals for energy conservation for the upcoming year
 - details energy management programs and strategies that were undertaken in the previous year to improve the energy efficiency of state agencies and the energy savings achieved

⁸ APPENDIX B – UCA §63-9-63

⁹ APPENDIX C – UCA §63-9-67

¹⁰ During the 2007 General Session, the subcommittee was renamed the Capital Facilities and Government Operations Appropriations Subcommittee.

Additionally, directives contained in UCA §63-9-67(3) require state agencies to:

- designate a staff member that is responsible for coordinating energy efficiency efforts within the agency
- provide energy consumption and cost information to the division
- develop strategies for improving energy efficiency and reducing energy costs
- provide information to DFCM regarding the agency's energy efficiency and reduction strategy

Finally, the Legislature authorized state agencies to enter into an energy savings agreement for a term of up to 20 years under the provisions of UC 63-9-67(4). However, the state agency may enter into an energy savings agreement only if it agrees to:

- utilize DFCM to oversee the project unless the project is exempt from the division's oversight or the oversight is delegated to the agency
- obtain prior approval of the governor or the governor's designee
- provide the Office of the Legislative Fiscal Analyst with a copy of the proposed agreement before the agency enters into the agreement

Policy Directives for Energy Efficiency in State Vehicles

In August 2007, Governor Huntsman directed DAS to increase the purchase of high efficiency vehicles that will assist in realizing the policy goals of improving fleet fuel efficiency, as well as Utah's air quality and environment. In effect, the directive requires the purchase of cleaner vehicles, hybrids or alternative fuel vehicles, where feasible, during the replacement cycle for all light duty vehicles.¹¹ The Governor further directed DAS to pursue the Alternative Compliance Waiver for EPACT compliance.

Amendments to UCA §63A-9-401.5,¹² enacted by the Utah State Legislature during the 2007 General Session, directed DFO to develop and coordinate the implementation of a statewide vehicle fleet cost efficiency plan to ensure continuing progress toward statewide overall cost reduction in government vehicle costs. UCA §63A-9-401.5(1) specifically requires that the plan include:

- goals for vehicle fleet cost efficiency
- a summary of agency submitted plans, statistics, and progress
- standard measures of cost including:
 - vehicle cost per mile
 - total vehicles
 - total fuel used
 - miles per gallon of fuel

¹¹ Law enforcement vehicles are exempted due to operational needs and vehicle performance requirements.

¹² APPENDIX D – UCA §63A-9-401.5

- goals for purchasing the most economically appropriate size and type of vehicle for the purpose and driving conditions for which the vehicle will be used
- cost reduction measures which may include:
 - reducing engine idle time
 - driving fewer miles
 - using car pools when possible
 - avoiding rush hour traffic
 - reducing aggressive driving
 - providing proper preventative maintenance including properly inflated tires
 - purchasing from state fuel sites and using the lowest octane fuel
 - reducing inventories of underutilized vehicles
 - education to inform drivers of their accountability on implementing their own plans

UCA §63A-9-401.5(2) further requires DFO to assist agencies to develop and implement their own plans. Finally, UCA §63A-9-401.5(3) requires each agency that owns or leases vehicles to “develop, implement, and submit to the division a vehicle fleet cost efficiency plan for their agency. The plan shall include agency goals and statistics, and a report of agency progress.”

In summary, the directives from the Governor’s Office and the Legislative Branch on state facilities and vehicles require state agencies to: (1) demonstrate leadership in promoting energy efficiency by implementing measures designed to improve energy efficiency in state facilities and state vehicles, and (2) report to the Governor and Legislature on efforts undertaken and progress towards improving energy efficiency.

AGENCY RESPONSE TO POLICY DIRECTIVES

State agencies are implementing measures to improve energy efficiency and meet the official goal of increasing energy efficiency 20 percent by 2015 in response to the directives issued by both the Governor and the Utah State Legislature. Additionally, both DFCM and DFO, as the agencies tasked with coordinating statewide efforts to improve energy efficiency, have created the organizational structure needed for a statewide effort to report and track progress towards the state's energy efficiency goal.

Agencies Have Taken Steps to Address Policy Directives Pertaining to Facilities

Energy projects on existing buildings are prioritized by how quickly the state's money is returned based on generating actual savings. Utility companies provide incentive funds to help shorten the length of time for simple payback, making some projects more attractive than others. For large scale projects, alternative sources of funding such as performance contracts have also been utilized and are available through the private market.

Since the 2006 General Session, DFCM has developed and implemented a series of programs, and building and equipment standards specifically designed to address policy directives to improve energy efficiency in both new and existing buildings. Specifically, DFCM:

- developed and incorporated the High Performance Building Design Standards for new construction projects into the DFCM Design Manual
- continues to work with agencies to improve energy efficiency in existing buildings through lighting retrofits and re-commissioning projects
- entered into Utility Energy Efficiency contracts to take advantage of demand side management incentives provided by utilities
- continues to monitor the effectiveness of projects using Energy Savings Performance Contracts (ESCO)
- participated in the development of a Building Operator Certification Program to be offered by Salt Lake Community College to those managing and operating state and commercial buildings, schools and similar settings
- began and continues to gather energy usage and cost information

By implementing these measures, DFCM has created a solid foundation for a long-term coordinated effort to achieve the state's energy efficiency goal. These measures provide a comprehensive approach to aggressively reduce energy use and operating costs in new and existing state facilities through:

- a variety of energy efficiency requirements in design
- procurement of cost effective energy efficient materials and equipment
- use of incentives offered by utilities
- training in building operation and maintenance best practices
- monitoring of energy consumption

Required Use of High Performance Building Design Standards in New Buildings

Building for energy efficiency is standard practice in new construction. On March 15, 2006, the Utah State Building Board approved the use of DFCM's High Performance Building Design Standards in the state's new construction projects. The standards are similar to the nationally recognized LEED™ (Leadership in Energy and Environmental Design) program,¹³ and promote integrated building design to maximize building performance and provide better air quality, lighting and acoustics. They require the use of:

- energy efficient products¹⁴ – requires procurement of products and equipment that are life-cycle cost effective and are in the upper 25 percent range of the energy efficiency rating
- energy design standards¹⁵ – sets minimum requirements for energy design of the building envelope, mechanical systems, lighting systems, service water heating, power, and other equipment
- High Performance Building Rating System¹⁶ - requires designs to comply with minimum energy efficiency, water conservation, and indoor environment improvements standards

In short, the High Performance Building Design Standards require DFCM and agencies to procure cost effective, energy efficient products for use in new buildings and meet more stringent requirements than would otherwise be required if standard energy code were to apply to a project.

Use of High Performance Building Design Standards in New Construction

The State of Utah has aggressively used the High Performance Building Design Standards to incorporate energy efficiency measures in new construction. In the last two years, these standards were used in 20 new construction projects.¹⁷ Five of the new construction projects were completed in 2007. Of the remaining 15 projects, nine are new buildings specifically designed to meet the new standards. The Utah Valley State College Digital Learning Center which will be completed in the summer of 2008 is the first building to be completed that is specifically designed to meet the High Performance Building Design Standards.

¹³ It should be noted that LEED primarily focuses on sustainability and DFCM's High Performance Building Design Standards focus primarily on energy efficiency. The rating systems also differ in the elements that are taken into consideration when rating a project.

¹⁴ APPENDIX E – DFCM Requirements.

¹⁵ Ibid.

¹⁶ APPENDIX F – High Performance Building Rating System

¹⁷ See, TABLE I and TABLE III, *infra*.

Impact of High Performance Building Design Standards in the Five Completed Projects

The five completed projects show that the state can reap significant monetary and environmental benefits from the use of High Performance Building Design Standards. The state will benefit from the receipt of incentives provided by utilities and reductions in energy consumption, utility costs, and emissions.

Projections suggest that the state's expenditure of \$594,640 on energy efficiency measures to meet the new building design standards in the construction projects completed in 2007 will produce the following long-term benefits:

- annual savings of \$81,065 in utility costs or \$1,621,300 over 20 years
- annual reductions in energy consumption of 1,224,425 kWh or 24,488,500 kWh over 20 years
- annual reductions in energy demand of 303.1 kW or 6,062 kW over 20 years
- annual reductions in carbon emissions of 209 metric tons or 4,180 metric tons over 20 years
- annual reductions in carbon dioxide emissions of 766 metric tons or 15,320 metric tons over 20 years
- the removal of the equivalent of 85 cars from the road for 20 years

TABLE I: Energy and Cost Savings from Five Completed new Projects in 2007

Impact of Energy Efficiency Measures Required by High Performance Design Standards							
Project	Report Date	Electricity Savings (kWh)	Demand Savings (kW)	Annual Savings	Project Costs	Simple Payback (years)	Utility Incentives
Toole Courts	7/1/07	256,841	88.00	\$19,538	\$93,621	4.79	\$36,900
SLCC Jordan Campus Chiller	10/11/07	57,040	42.00	\$7,602	\$36,058	4.74	\$8,945
SLCC Health Sciences Center	11/19/07	207,178	50.00	\$12,644	\$107,671	8.52	\$27,361
UOU Warnock Engineering Bldg.	12/13/07	525,200	84.00	\$30,996	\$323,274	10.43	\$67,224
SLCC Health Sciences Center: Lighting Only	1/5/07	178,166	39.10	\$10,285	\$34,016	3.31	\$38,060 ¹
Total		1,224,425	303.10	\$81,065	\$594,640		\$178,490
Notes:							
¹ Incentives exceed project costs because the utility provides more money to the state than it costs the state to purchase premium T8 lighting.							

Table I shows the monetary benefits and reduction in energy consumption that the state will realize from using the new standards in these projects. The numbers contained

in the table have been audited by an outside agency. Amounts spent on energy efficiency measures will yield:

- \$178,490 in incentives from Rocky Mountain Power. The incentives are paid to the state and offset the state’s initial investment. The net result is a total cost of \$416,150.
- \$81,065 in utility cost savings annually
- Reduce energy consumption 1,224,425 kWh annually

The average simple payback for the five projects is 7.3 years without incentives, and 5.1 years with incentives.

TABLE II: Energy and Emission Savings from Five Completed new Projects

Projected Annual Reductions in Energy Consumption and Emissions	
Savings/Reductions	Amount
Natural Gas Savings (Thou. Cubic Ft)	---
Electricity Savings (mWh)	1,224
Demand Savings (kW)	303
Site Delivered Btu (billion)	4
Source Btu (billion)	15
Carbon Emissions reductions (metric tons) ¹	209
Carbon Dioxide Emissions (metric tons)	766
Equivalent Number of Cars	85
Note:	
¹ National average was used for converting Btu (British thermal unit) to carbon emissions	

Annual reductions in carbon or carbon dioxide emissions¹⁸ resulting from the use of the new building standards in the five completed new construction projects are shown in Table II. Estimates indicate that the standards can:

- reduce carbon emissions by 209 metric tons annually
- reduce carbon dioxide emissions by 766 metric tons annually
- remove the equivalent of 85 cars off the road annually

¹⁸ Carbon has historically been used to measure emission. However, current trend is to use carbon dioxide.

FIGURE I: Benefits and Expenses Projections – Five Completed Construction Projects

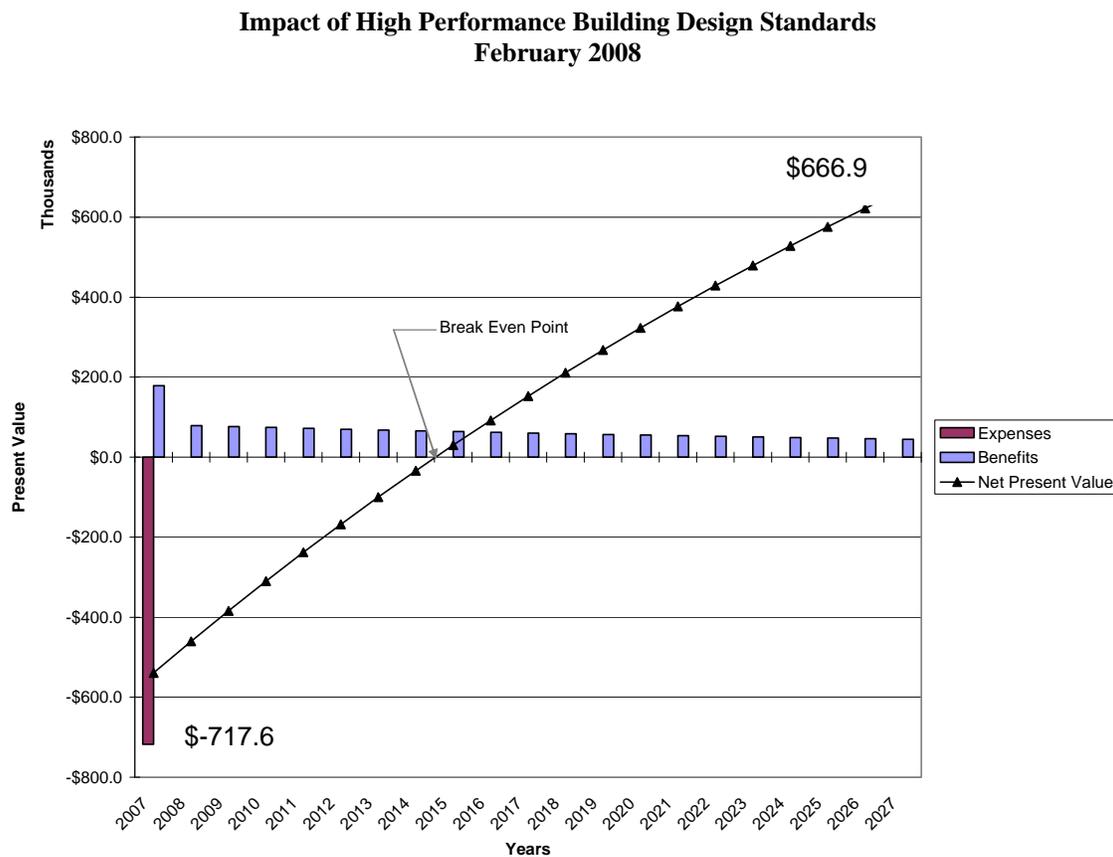


Figure I, shows the expenses incurred, and expected benefits that will accrue to the state over 20 years as a result of using the new building standards in the construction of these five projects. Specifically:

- a total of \$717,640 was spent on the projects; of the total amount expended, \$594,640 was spent on measures required by the new standard, and another \$123,000 to run the program¹⁹
- \$178,490 in utility incentives
- \$81,065 in utility cost savings annually or \$1,621,300 over 20 years
- the present value of utility cost saving and utility incentives is projected at \$1,384,500 over 20 years at a discount rate of 3 percent
- the net present value of the projects is estimated to be \$666,892 at a discount rate of 3 percent

¹⁹ \$594,640 (project costs) + \$123,000 (program costs) = \$717,640 in program costs for the total cost of the investment

Impact of High Performance Building Design Standards on 15 Projects Still to be Completed

Similar results are expected from the 15 new construction projects that are yet to be completed. Current projections indicate that the expenditure of \$5,890,809 to meet the more stringent requirements of the new building standards will yield the following long-term benefits:

- annual savings of \$553,878 in utility costs or \$11,077,560 over 20 years
- annual reductions in energy consumption of 6,787,628 kWh or 135,752,560 kWh over 20 years
- annual reductions in energy demand of 1,468 kW or 29,360 kW over 20 years
- annual reductions in carbon emissions of 1,159 metric tons or 23,180 metric tons over 20 years
- annual reductions in carbon dioxide emissions of 4,247 metric tons or 84,940 metric tons over 20 years
- the removal of the equivalent of 472 cars from the road for 20 years

Table III identifies 15 projects in which the new design standards are being used. The data for nine of the 15 projects have been audited by an outside agency and are highlighted in grey. The remaining six of the projects have had preliminary cost estimates completed by SBEEP and are awaiting energy audits.

TABLE III: Energy and Cost Savings from 15 new Construction Projects to be Completed

Projected Impact of Energy Efficiency Measures Required by High Performance Design Standards						
Project	Electricity Savings (kWh)	Demand Savings (kW)	Annual Savings	Project Costs	Simple Payback (years)	Utility Incentives
UOU Sutton Geophysics Building.	358,460	103.00	\$21,859	\$161,932	7.41	\$ 48,165
UOU College of Humanities	186,669	28.30	\$9,716	\$82,376	8.48	\$18,516
UOU Hospital Expansion	379,323	60.40	\$19,776	\$124,784	6.31	\$41,427
UVSC Digital Learning Center*	2,009,333	339.00	\$ 97,926	\$1,016,325	10.38	\$ 258,070
UOU Marriott Library	508,992	109.10	\$ 28,991	\$93,691	3.23	\$46,208
WSU Central Chiller	1,006,800	266.00	\$114,816	\$373,418	3.25	\$127,395
WSU Humanities Building	274,930	79.00	\$16,206	\$228,737	14.11	\$36,870
DATC Technology / Manufacturing Building* ¹	--	--	\$19,224	\$213,600	11.11	--
SNW Library/Classroom Building* ¹	--	--	\$23,829	\$264,765	11.11	--
DMV Draper*	68,616	39.50	\$8,698	\$36,729	4.22	\$9,112
UOU Museum of Natural History*	570,463	199.30	\$44,049	\$707,772	16.07	\$78,417
HS Unified Lab & Replacement*	1,424,042	244.00	\$99,335	\$2,037,200	20.51	\$183,157
UOU Nursing Renovation* ¹	--	--	\$3,092	\$34,350	11.11	\$2,746
DPS/Tax Commission Joint Building* ¹	--	--	\$7,212	\$80,130	11.11	\$6,410
Courts St. George Courthouse* ¹	--	--	\$39,150	\$435,000	11.11	--
Total	6,787,628	1,467.60	\$553,878	\$5,890,809		\$856,495
* building specifically designed to meet DFCM High Performance Building Design Standard						
¹ Annual savings are estimated. Project's energy savings have yet to be verified by a third party.						

Table III shows the monetary benefits and reduction in energy consumption that the state will realize from the use of the new building standards. Amounts spent on energy efficiency measures will yield:

- \$856,495 in incentives from Rocky Mountain Power; the incentives are paid to the state and offset the state's initial investment. The net result is a total cost of \$5,034,314
- \$553,878 in utility cost savings annually

- reduce energy consumption 6,787,628 kWh annually

The average simple payback for the nine audited projects is 10.5 years without incentives and 8.7 with incentives.

TABLE IV: Projected Energy and Emission Savings from 15 new Construction Projects to be Completed

Projected Annual Reductions in Energy Consumption and Emissions	
Savings/Reductions	Amount
Natural Gas Savings (Thou. Cubic Ft)	
Electricity Savings (mWh)	6,787,628
Demand Savings (kW)	1,467
Site Delivered Btu (billion)	23
Source Btu (billion)	80
Carbon Emissions reductions (metric tons)	1,159
Carbon Dioxide Emissions (metric tons)	4,247
Equivalent Number of Cars	472

Table IV shows the reductions in emissions that are expected as a result of using the new standards. SBEEP estimates that these projects will:

- reduce carbon emissions by 1,159 metric tons annually
- reduce carbon dioxide emissions by 4,247 metric tons annually
- remove the equivalent of 472 cars off the road annually

FIGURE II: Benefits and Expenses Projections - 15 Projects to be Completed

**Impact of High Performance Building Design Standards
February 2008**

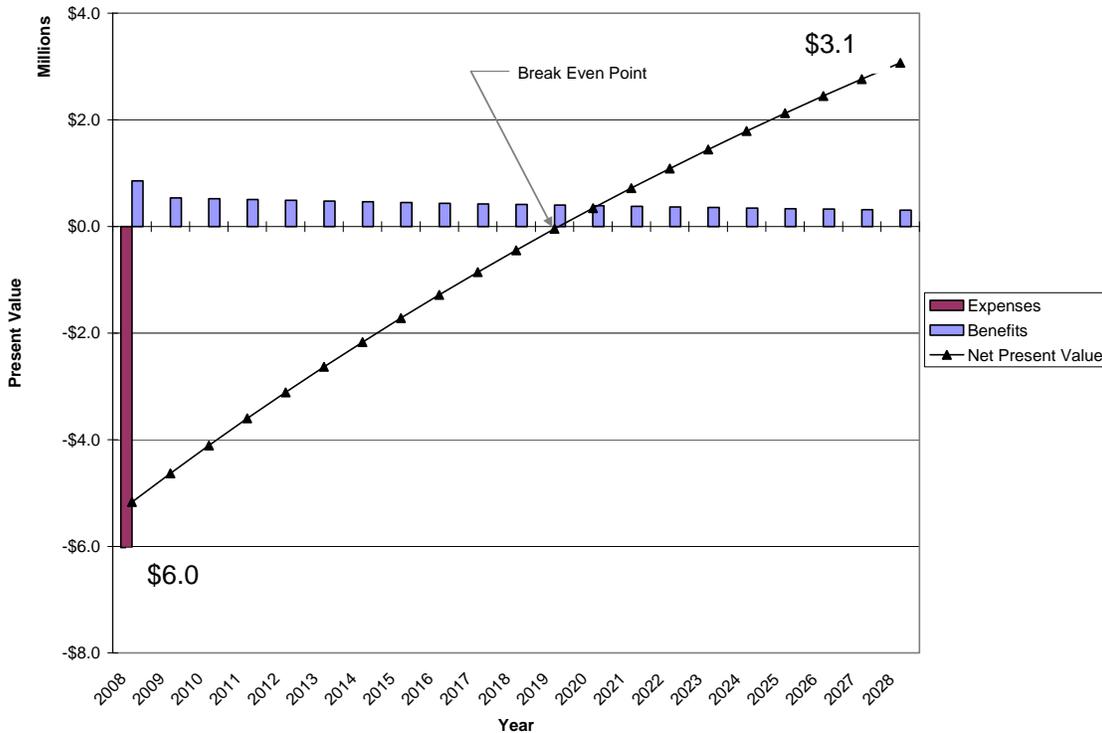


Figure II, shows the expenses incurred, and expected benefits that will accrue to the state over 20 years as a result of using the new building standards in the construction of these 15 projects. Specifically:

- a total of \$6,024,809 is projected to be spent on the projects; of the total amount to be expended, \$5,890,809 will be spent on measures required by the new standard, and another \$134,000 to run the program²⁰
- \$856,500 in utility incentives
- \$553,878 in utility cost savings annually or \$11,077,500 over 20 years
- the present value of the utility cost savings and incentives is projected at \$9,096,800 over 20 years at a discount rate of 3 percent
- the net present value of the projects is estimated to be \$3,071,993 at a discount rate of 3 percent

²⁰ \$5,890,809 (project costs) + \$134,000 (program costs)= \$6,204,809 for the total investment

**Utah Valley State College
Digital Learning Center**

The UVSC Digital Learning Center (DLC) is of particular interest when discussing energy efficiency in new buildings. The DLC will be the first state building in the state’s inventory that was specifically designed to meet the requirements of the High Performance Building Design Standards. The building demonstrates how energy efficiency can be improved and emissions reduced in future construction projects.



TABLE V: Energy and Cost Savings in UVSC Digital Learning Center

Projected Impact of Energy Efficiency Measures Required by High Performance Design Standards						
Project	Electricity Savings (kWh)	Demand Savings (kW)	Annual Savings	Project Costs	Simple Payback (years)	Utility Incentives
UVSC Digital Learning Center	2,009,333	339.00	\$97,926	\$1,016,325	10.38	\$258,070

Table V shows that the state’s investment of \$1,016,325 in energy efficiency measures in the DLC is expected to result in:

- \$258,070 in incentives from Rocky Mountain Power
- \$97,926 in utility cost savings annually
- reduce annual energy consumption by 2,009,333 kWh
- reduce annual energy demand by 339 kW

Energy Efficiency Improvements in Existing Buildings

DFCM, in partnership with other state agencies, has also undertaken lighting retrofit and re-commissioning projects to optimize energy efficiency in existing buildings. The state’s experience with these projects suggests that significant efficiencies can be realized in this area. The state’s \$1,833,905 expenditure in these projects is projected to yield:

- cost savings of \$675,101 annually in utility costs or \$10,126,515 over 15 years
- reductions in energy consumption of 11,138,279 kWh annually or 167,074,185 over 15 years

- reductions in energy demand of 2,129.0 kW annually or 31,935 over 15 years
- reductions in carbon emissions of 1,985 metric tons annually or 29,775 over 15 years
- reductions in carbon dioxide missions of 7,275 metric tons annually or 109,125 over 15 years
- the removal of the equivalent of 808 cars from the road for 15 years

Table VI shows the 66 lighting retrofit and building re-commissioning projects that have so far been undertaken. Lighting retrofit projects are highlighted in yellow and building re-commissioning projects are highlighted in green.

TABLE VI: Energy and Cost Savings in Lighting Retrofit and Re-Commissioning Projects

Projected Impact of Energy Efficiency Measures by Lighting Retrofit and Re-Commissioning Projects							
Project	Electricity Savings (kWh)	Demand Savings (kW)	Annual Savings \$	Project Costs \$	Simple Payback (years)	Utility Incentives \$	Self Direction Credits \$
WSU Stromberg, Eng Tech	957,196	192.00	\$50,353	\$162,241	3.22	\$ ----	\$129,793
NG Armory Cedar City	31,109	9.00	2,230	13,746	6.16	--	10,997
Gunnison Prison	451,272	122.80	27,554	81,683	2.96	--	65,347
DJJS Wasatch Youth Center	71,869	20.00	4,488	18,601	3.58	--	14,881
State Hospital Adult Psychiatric	171,782	36.00	9,169	43,033	4.14	--	34,426
Ogden Weber ATC	178,166	39.10	10,285	34,016	3.31	--	38,060
SUU Sharwan Smith Center	139,888	18.0	7,456	15,292	2.05	--	12,234
SUU Electronic Learning Cntr.	59,910	10.00	3,483	8,451	2.43	--	6,761
WFS Administration Bldg.	323,488	78.00	19,086	82,797	4.34	--	66,238
UDAF Agriculture Bldg.	114,956	37.20	6,782	27,659	4.08	--	22,127
CRT Layton Second District Ctr.	38,041	11.00	2,783	10,209	3.67	--	8,167
CPB State Office Building	221,708	65.80	13,081	71,086	5.43	--	56,869
UDOT Region 2 Complex	92,713	30.20	7,304	29,233	4.00	--	23,386
State Hospital Boiler Plant	16,578	3.00	822	5,739	6.23	--	4,591
State Hospital Laundry	30,215	8.00	1,807	7,788	3.74	--	6,231
State Hospital NE Storage	1,281	1.00	96	688	5.88	--	535
UVSC Warehouse Lighting	29,193	15.40	1,784	12,506	7.01	--	10,005
SUU Administration Bldg.	79,547	19.00	5,554	25,937	4.67	--	20,750
SUU Warehouse Motorpool	80,960	19.00	5,541	15,957	2.88	--	12,766
HS Clearfield Center	36,899	15.00	3,334	14,667	4.40	--	11,734
WFS Metro & Parking Struct.	97,442	21.80	5,637	25,466	4.52	--	20,373
WFS Richfield Bldg.	5,797	2.00	459	6,502	14.17	--	5,202
WSU Training & Learning Cntr.	47,885	8.00	2,408	33,220	13.80	5,027	---
SLCC Construction Trades	208,145	65.40	16,856	63,069	3.74	--	50,455
UoU Biomedical Polymers Bld.	173,234	61.40	6,733	2,816	0.42	--	---
UoU Eccles Inst. Human Genet.	2,107,435	175.00	61,452	65,670	1.07	--	---
WSU Student Services	250,200	59.00	30,944	13,740	0.44	--	---
HS Cannon Health	185,314	145.50	26,986	4,3450	0.16	--	---
SUU Student Center	186,059	33.00	9,048	5,382	0.59	--	---
SUU Sharwan Smith Center	421,962	116.00	25,532	11,000	0.43	--	---
SUU Centrum Arena	203,849	54.00	11,657	10,350	0.89	--	---
NG Spanish Fork Lighting	40,537	16.80	2,717	22,589	8.31	--	---
USU Engineering Lab Lighting	101,892	28.50	6,695	65,750	9.82	--	---

Continued on the next page

TABLE VI: Energy and Cost Savings in Lighting Retrofit and Re-Commissioning Projects (continued)

Projected Impact of Energy Efficiency Measures by Lighting Retrofit and Re-Commissioning Projects							
Project	Electricity Savings (kWh)	Demand Savings (kW)	Annual Savings \$	Project Costs \$	Simple Payback (years)	Utility Incentives \$	Self Direction Credits \$
WFS St. George Facility	7,133	2.90	\$720	\$5,484	7.62	\$--	\$---
ATC Uintah Basin Lighting	135,786	93.40	10,252	57,969	5.65	--	---
USU Education Building	171,509	29.37	12,907	67,333	5.22	--	---
USU Old Main Building	242,944	41.60	18,221	94,552	5.19	--	---
USU Nat. Resources/Quinney	71,613	17.70	4,387	51,186	11.67	--	---
SNW Activity Center	71,804	14.60	6,098	24,840	4.07	--	---
SNW Humanity Building	52,557	13.90	4,675	21,711	4.64	--	---
DIX McDonald Center	74,088	13.10	4,140	17,729	4.28	--	---
DIX Smith Computer Center	32,768	7.20	2,041	9,210	4.51	--	---
DIX Automotive Shop	88,118	23.10	5,496	24,538	4.46	--	---
UoU EMBC	415,557	35.60	18,476	90,000	4.87	--	72,000
UoU Hyper Complex	752,430	60.50	28,311	144,124	5.09	--	115,299
DJJS Southwest	7,858	2.00	404	2,190	4.80	--	1,752
UDOT Region 1 Well Ave	24,609	8.90	2,074	9,439	4.55	--	7,551
WFS Ogden South Bldg.	36,561	11.00	2,787	12,922	4.64	--	10,338
USU Space Dynamics	324,350	7.30	9,414	10,010	1.06	--	---
NG Camp Williams Readiness	267,100	82.00	74,191	41,892	0.56	--	---
DIX Cox Auditorium	312,510	21.00	16,902	12,020	0.71	--	---
DIX McDonald Center	113,188	--	5,890	1,320	0.22	--	---
TAX State Tax Commission	--	--	12,000	10,000	0.83	--	---
Community Center for Deaf	34,742	8.0	2,197	9,620	4.38	--	7,696
WFS Administration Bldg.	187,826	11.00	6,908	1,163	0.17	--	---
COR Orange Str. Community	73,586	13.00	4,158	15,978	3.84	--	12,782
COR Freemont Community	47,643	9.00	2,813	15,805	5.62	--	12,644
COR Bonneville Community	64,968	15.00	4,156	19,686	4.74	--	15,749
GVMP Governor's Mansion	98,149	25.10	6,119	6,816	1.11	--	4,895
WSU Engineering Tech	185,830	48.90	11,877	53,486	4.50	--	42,788
DAS/DFCM Phase A	--	--	--	4,496	--	--	3,597
NG Tooele Armory	20,518	7.30	1,705	4,374	2.57	--	3,499
SUU Phase I lighting	--	--	--	4,550	--	--	3,640
COR Phase I lighting	--	--	--	2,100	--	--	1,680
UDOT Region 1 lighting	66,012	24.60	5,668	20,998	3.70	--	16,798
HS Phase I lighting	--	--	--	5,150	--	--	4,120
Grand Total	11,138,279	2,128.97	\$675,101	\$1,883,905	2.78	5,027	\$968,754

Table VI shows the monetary benefits and reduction in energy consumption that the state will realize from lighting and building retrofit projects. The \$1,883,905 spent directly on lighting retrofit and building re-commissioning projects are expected to:

- generate \$968,754 in utility credits to offset initial investment
- save \$675,101 in utility cost savings annually
- reduce energy consumption by 11,138,279 kWh annually
- achieve a 2.8 year simple payback on investment without incentives

TABLE VII: Energy and Emission Savings from Lighting Retrofits and Re-Commissioning Projects

Projected Annual Reductions in Energy Consumption and Emissions	
Savings/Reductions	Amount
Natural Gas Savings (Thou. Cubic Ft)	5,610
Electricity Savings (mWh)	11,138
Demand Savings (kW)	2,129
Site Delivered Btu (billion)	43.8
Source Btu (billion)	137.8
Carbon Emissions reductions (metric tons)	1,985
Carbon Dioxide Emissions (metric tons)	7,275
Equivalent Number of Cars	808

Annual reductions in carbon or carbon dioxide emissions²¹ resulting from the use of the new building standards in the five completed new construction projects are shown in Table VII. Estimates indicate that the standards can:

- reduce carbon emissions by 1,985 metric tons annually
- reduce carbon dioxide emissions by 7,275 metric tons annually
- remove the equivalent of 808 cars off the road annually

²¹ Carbon has historically been used to measure emission. However, current trend is to use carbon dioxide.

FIGURE III: Benefits and Expenses Projections - Lighting Retrofit and Re-commissioning Projects

February 2008 Projections

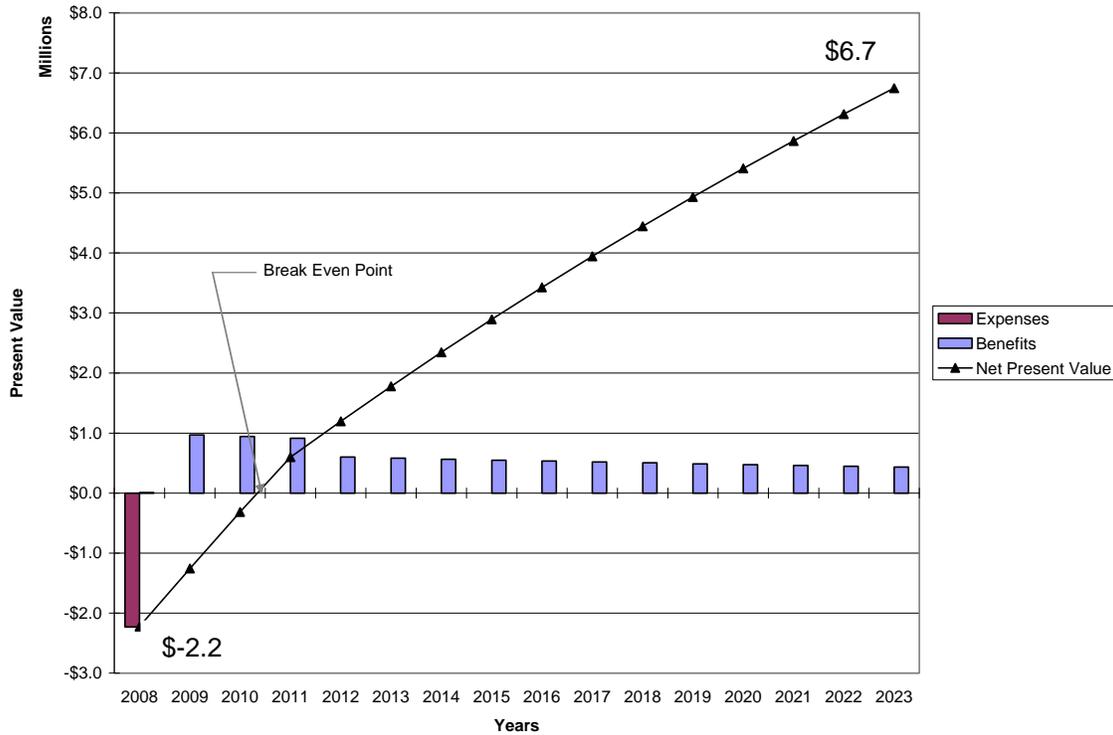


Figure III shows the expenses incurred, and expected benefits that will accrue to the state over 15 years from lighting retrofit and re-commissioning projects. Specifically:

- a total of \$2,230,905 is projected to be spent on the projects in existing buildings; of the total amount to be expended, \$1,883.905 will be spent directly on energy efficiency measures required by the new standard, and another \$347,000 to run the program²²
- \$680,128 in utility credits and incentives
- \$675,100 in utility cost savings annually or \$10,126,500 over 15 years
- the present value of utility cost savings, utility incentives and credits is projected at \$8,978,000 over 15 years at a discount rate of 3 percent
- the net present value of the projects is estimated to be \$6,747,000 at a discount rate of 3 percent

Energy Efficiency Measures Implemented by SBEEP are Helping the State Achieve its Goal

Internal estimates prepared by SBEEP suggest that projects implemented by state agencies are significantly contributing to meeting the goal to improve energy efficiency

²² \$1,883,905 (project costs) + \$347,000 (program costs) = \$2,230,905 total investment

20 percent by 2015. Table VIII provides a framework comparing accomplishments with annual interim benchmarks to measure the state’s progress toward the goal. As shown by the information contained in the “Impact of Energy Efficiency Measures” column, achievements to date, while sizeable, lag behind interim targets. However, the inroads made toward achieving the state’s energy efficiency goal have been accomplished with limited funding.

Projects that have been carried out by SBEEP show the critical role that funding will play in achieving the state’s energy efficiency goal. The projects show that significant inroads toward its target will require the state to invest in making its facilities more energy efficient. State appropriations are required to fund personnel costs, investments in buildings, vehicles, and other energy programs. Nevertheless, current estimates also indicate that the costs incurred by the state in implementing energy efficient measures will, over time, not only yield monetary benefits that outstrip costs of the project, but also significantly reduce emissions.

New funding will be required to implement new energy efficiency projects, but the state cannot rely solely on funding to reach the energy efficiency goal. While DAS is working with the Governor’s Office and the Legislature to increase funding to \$5,000,000 per year, estimates indicate that this level of funding puts the program on track to achieve a 15 percent increase in energy efficiency by 2015. The remaining five percent should come from other energy savings options or programs.

TABLE VIII: Data Tracking to Increase Energy Efficiency 20 percent by 2015

Contributions to Achieving Energy Efficiency Goal State Building Energy Efficiency Program Projects							
Fiscal Year	Gross Sq. ft. ^o (million)	Baseline Source Energy ¹ (Btu/GSF)	Energy Efficiency Target			Impact of Energy Efficiency Measures	
			Source Energy (Btu/GSF)	Reduction in Source Energy ²	Increase in Energy Efficiency ³	Source Energy (Btu/GSF)	Increase in Energy Efficiency
2006	42.47	280,646	280,646	0.0%	0.0%	280,646	0.0%
2007	43.51	280,646	275,143	2.0%	2.0%	278,790	0.7%
2008	44.47	280,646	269,852	3.8%	4.0%	275,406	1.9%
2009	45.45	280,646	264,760	6.0%	6.0%	268,471 ^a	4.3%
2010	46.45	280,646	259,857	7.4%	8.0%		
2011	47.47	280,646	255,133	9.1%	10.0%		
2012	48.51	280,646	250,577	10.7%	12.0%		
2013	49.58	280,646	246,181	12.3%	14.0%		
2014	50.67	280,646	241,936	13.8%	16.0%		
2015	51.79	280,646	237,836	15.3%	18.0%		
2016	52.93	280,646	233,872	16.7%	20.0%		

^o Increases are based on historical data indicating 2.2 percent increases in square footage of state-owned buildings per year. Division of Risk Management inventory of state-owned building was used. Buildings with less than 5000 GSF were excluded from the data set.

¹ Estimated

² Calculated as follows: (Btu/GSF proposed – Btu/GSF baseline) / (Btu/GSF baseline)

³ Calculated as follows: (1/(Btu/GSF) proposed – 1/(Btu/GSF) baseline) / (1/(Btu/GSF) baseline)

^a Assumes investment of \$5M in energy efficiency projects for the fiscal year

Table VIII also shows that in order for the state to meet its goal for increasing energy efficiency 20 percent, it needs to reduce source energy use by 16.7 percent. Note however, that the baseline source energy use and the building square footage are both estimated numbers. Over the next year, a thorough data gathering effort will update and verify the numbers.

DFCM is Studying Methods of Funding Energy Efficiency Measures

DFCM is studying the efficacy of Energy Savings Performance Contracts with Energy Savings Companies (ESCO) as a means of financing energy efficiency projects. By using an ESCO, the projects serve as models for methods of financing that state agencies may utilize to minimize state appropriations. Through the contract, payment to the contractor is made through a guaranteed stream of future energy cost savings. In effect, the project is self-funded and does not require appropriations to proceed.

Three energy efficiency pilot projects were funded in this manner:

- UVSC (campus wide)
- Department of Corrections Draper Campus
- Ogden Regional Building

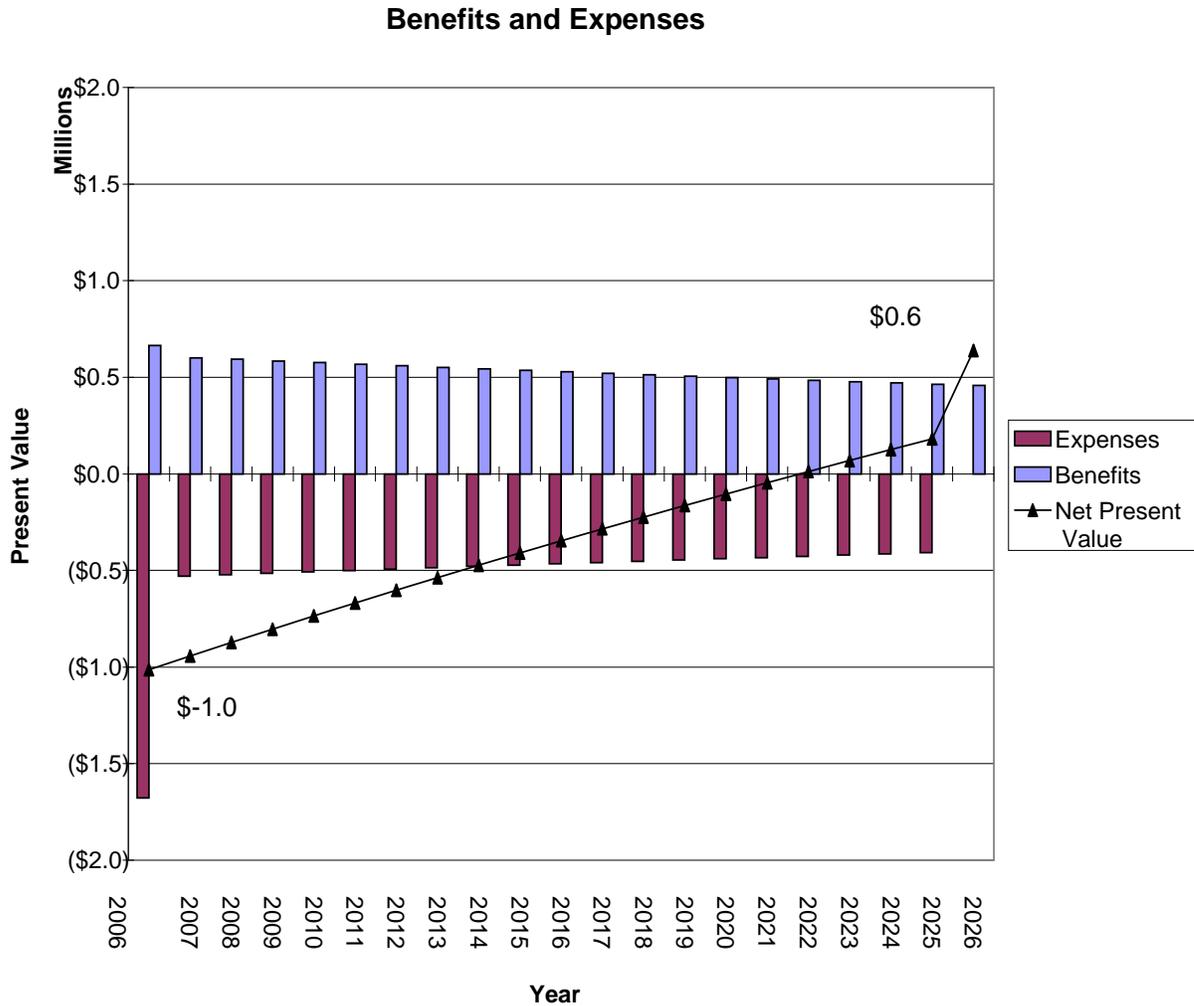
Table IX, below shows the annual reductions in energy and emissions for the ESCO project completed at UVSC.

TABLE IX: Projected Energy and Emission Savings from UVSC ESCO Project

UVSC ESCO Project Projected Annual Reductions in Energy Consumption and Emissions	
Savings/Reductions	Amount
Natural Gas Savings (Thou. Cubic Ft)	6,907
Electricity Savings (mWh)	6,213
Demand Savings (kW)	852
Site Delivered Btu (billion)	28
Source Btu (billion)	81
Carbon Emissions reductions (metric tons)	1,164
Carbon Dioxide Emissions (metric tons)	4,265
Equivalent number of Cars	474

Figure IV shows the projected costs and benefits associated with the UVSC ESCO Project. Projections show that over a 20 year period, total benefits realized from incentives and annual energy savings exceed the total costs incurred from the down payment, principal and interest payments and other costs. Using a nominal discount rate of 4.9 percent, the net present value of benefits realized over 20 years is estimated to be \$11.2M. Total costs are estimated to have a net present value of \$10.6M. At the end of the 20 year period, the net present value of benefits will exceed the net present value of costs by \$0.6M.

FIGURE IV: UVSC Energy Saving Performance Contract



With benefits greater than costs, the UVSC project demonstrates this is a viable method of financing future construction projects. The relatively small difference between savings and costs suggests the need for close monitoring to insure projects are on time, the most cost-effective materials and equipment are used, and that only items identified in the contract are incorporated into the project.

Additionally, the Department of Corrections (DOC) ESCO project suggests that a thorough review of energy savings projections is required given the state’s focus. The August 2007 Performance Contract Value Report provided by DOC suggests that energy efficiency measures implemented have not performed as projected.²³ According to the report, the project has not met the guaranteed energy cost savings projections since its construction year. The shortfalls in amounts saved suggest shortfalls in projected energy consumption reductions. The extent to which projected reductions in consumption are not met affects the state’s ability to meet its goal of improving energy efficiency.

²³ APPENDIX G – Utah Department of Corrections – FY07 Performance Contract Value Report, p.6.

Reporting Mechanism for Statewide Effort to Track Energy Consumption in State Facilities is Being Developed

The policy directives on energy efficiency require the submission of comprehensive annual reports on progress towards achieving the state's long-term energy efficiency goal. Tracking progress towards a specific goal, over time, requires the establishment of a statewide baseline on energy consumption for a given year. The baseline provides a barometer against which the state's progress can be compared on an annual basis. For the purposes of tracking improvements in energy efficiency in state facilities, FY 2007 was chosen as the base year because of the dates on which the directives were issued.

Reporting responsibility under the Governor's executive order was transferred to DAS in September 2007. Since then DAS has concentrated on creating the organizational structure needed to facilitate communication and data collection. Creating the structure is important because the:

- scope of the initiative is statewide
- actual consumption data is lacking in accessible electronic databases
- need to verify the information contained in the inventory of state-owned buildings

These factors made clear that the assistance of all state agencies would be required in obtaining comprehensive consumption data. It was also important to provide training and education on how to report information accurately, uniformly, and completely.

Executive Director level meetings were held with Cabinet members and the Administrative Office of the Courts. The meetings served to:

- provide information about the mandates
- inform Cabinet members of the scope of the reporting responsibility
- enhance inter-departmental collaboration

Executive Directors also identified and assigned employees to act as their respective departments' representatives in the Energy Efficiency Resource Team.²⁴ It is anticipated that the team will act as an advisory group. The members will be the conduits to exchange information, feedback and coordinate with their respective departments.

²⁴ APPENDIX H – Table of Energy Efficiency Resource Team Members

Current Status of Reporting Mechanism For Energy Efficiency in Facilities

A kick-off meeting of the Energy Efficiency Resource Team was held on December 17, 2007. Team members were informed of the applicable mandates and reporting responsibilities. Also discussed were:

- deadlines to submit energy efficiency/conservation plans
- deadlines to submit energy consumption data
- tools for reporting and training requirements for consistent data entry
- types of facilities to include and exclude
- the Climate Registry

Agencies are currently verifying building inventory data and attending training on the Energy Star Portfolio Manager. It is the reporting tool that will be used to track energy consumption. Training is also provided on how to accurately extract consumption data from utility bills. Actual energy consumption data will be used to determine the FY 2007 baseline. Departments are to submit information for the baseline by June 2008.

Once training on Energy Star Portfolio Manager and accurately extracting consumption data from utility bills is completed, members of the Energy Efficiency Resource Team will focus on:

- verifying the accuracy of data contained in the inventory of state-owned buildings
- gathering and reporting energy consumption data for all state facilities for FY 2007
- whether to adopt a significance threshold and define the factors to be used in determining whether certain facilities will be eliminated from the data set
- whether a stratified statistical analysis of randomly selected facilities will suffice for reporting on overall improvements to energy efficiency

Agencies Submitted Energy Efficiency Plans

All departments with representatives at the kick-off meeting, along with the Administrative Offices of the Courts, have submitted energy efficiency plans.²⁵ Plans submitted typically focused on employee awareness and training, office energy conservation best practices, facility improvements and changes in facility management practices.²⁶

²⁵ APPENDIX I-1 to APPENDIX I-21 – Energy Efficiency Plans

²⁶ Some plans also contained measures for improving energy efficiency in motor vehicles. However, UCA §63A-9-401.5 requires agencies to submit plans specifically designed to address efficiency in motor vehicles. Plans on fleet efficiency are discussed in the motor vehicle section.

Focus on Human Behavior

All plans submitted recognized the critical role that employees play in achieving the state's energy efficiency goals. The plans create an environment of energy awareness by implementing measures designed to increase awareness about energy conservation to influence employee behavior both at work and at home. Employees receive training, information on environmental and financial benefits, as well as best practices in office energy conservation.

Agencies plan to increase energy awareness through meetings designed to inform employees of the environmental and financial benefits of energy conservation. Many agencies have conducted, or plan to conduct, department-wide meetings to increase energy awareness. Some have extended the impact of energy conservation beyond the workplace by asking employees to voluntarily pledge to replace incandescent lights in their homes with compact fluorescent bulbs.

Other agencies are enhancing energy awareness by creating employee-staffed committees that deal with energy conservation issues. For example, DEQ has created a Green Team comprised of representatives from each division and the Executive Director's Office to proactively engage employees in department efforts. Employee participation in developing policies is critical to acceptance of energy initiatives.

Facility Improvements and Changes to Facility Management

Departments focused on the need for cooperative efforts in maximizing energy efficiency in facilities they utilize. The state currently owns over 3,000 buildings. Approximately, 190 buildings are managed and maintained by DFCM. Departments with offices in DFCM-managed buildings expressed a desire to work with them to make facility improvements and change building management practices to improve efficiency. For example, several departments requested the installation of automated lighting control systems, programmable thermostats and energy efficient fluorescent lighting systems. Agencies also expressed a desire to see some changes in how the facilities are managed. They acknowledged the value of energy audits, maintaining building temperatures within guidelines, having janitorial staff work during business hours, and adjusting systems to non-occupied levels during non-work hours, in minimizing energy consumption.

The desire to make changes to leased facilities and the way in which facilities are managed, is not limited to buildings managed and operated by DFCM. State agencies that lease space from private landlords, like the Administrative Offices of the Courts, the Department of Workforce Services, the Department of Insurance, and the Tax Commission indicated that they are working with their landlords to implement energy conservation measures in leased spaces.

DFCM does not anticipate any difficulty in meeting agency demands for implementing facility improvements of the type requested by the agencies. DFCM standard practices correspond with the changes requested by the departments in their energy efficiency plans. To reduce building power usage, DFCM standard practice to:

- set temperatures in the 74-76 degree range in summer
- set temperatures in the 69-72 degree range in winter²⁷
- move janitorial staff to daytime work schedules
- place buildings in un-occupied mode outside normal work hours
- replace all incandescent light bulbs with more energy efficient fluorescent light bulb

²⁷ Department of Alcoholic Beverage Control stores have a mandated set point because of the inventory of goods. Each store is equipped with a programmable lock-out thermostat.

Agencies Have Taken Steps to Address Policy Directives Pertaining to Vehicles

DFO has put into practice measures specifically designed to address the policy directives of UCA §63A-9-401.5 and the Governor's mandate to purchase vehicles that would assist in improving fleet fuel efficiency and air quality in Utah. The measures ensure that the state has a comprehensive approach to monitoring fuel consumption and the state motor vehicle fleet's progress towards achieving the state's long-term energy and cost efficiency goals.

DFO implemented the following measures to ensure compliance with mandates issued by the Governor and Legislature on air quality, fuel efficiency and cost effectiveness:

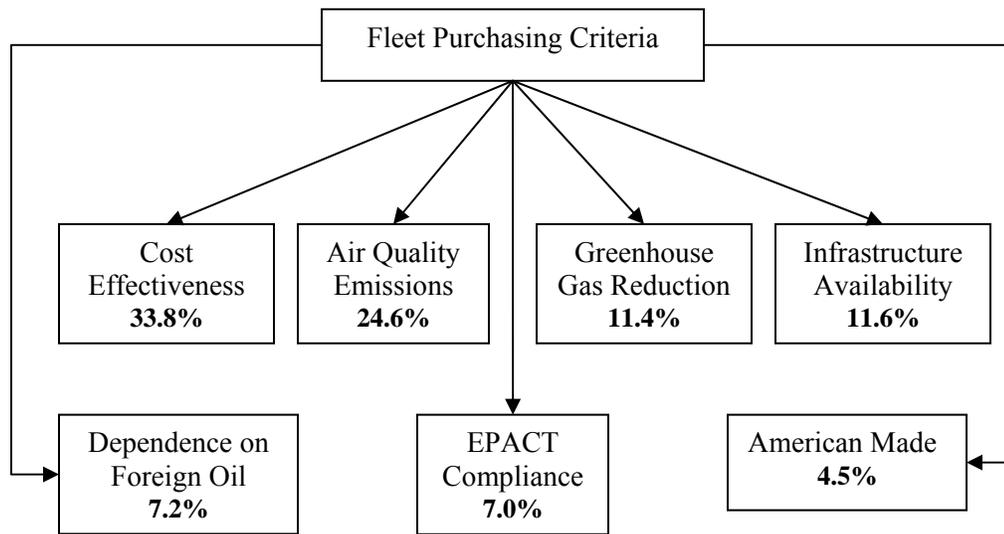
- development and use of the Fleet Purchasing Decision Tool
- required agencies to submit written justification for vehicle choices that deviated from established class standards
- developed a statewide motor vehicle efficiency plan
- required agencies to submit fleet efficiency plans pursuant to statute
- established baseline data against which the state fleet's progress toward the energy efficiency goal can be measured
- implemented initiatives to increase use of alternative fuels

DFO Implemented Measures Designed to Assist in Right-Sizing Vehicles

DFO has implemented policies and practices designed to ensure that vehicles being purchased are right-sized, or downsized, to the most economically appropriate vehicles for the purposes and driving conditions for which they will be used, and that they still meet the state's energy and environmental policy initiatives. First, DFO, with the assistance of the Governor's Office of Planning and Budget, developed a Fleet Purchasing Decision Tool to evaluate a vehicle's compliance with the Legislature's and the Governor's air quality, fuel efficiency and cost effectiveness directives. Second, DFO required: (a) agencies to justify vehicle choices that were different from established class standards, and (b) review and approval of requested vehicles by the Executive Director of DAS.

Figure V shows the seven criteria that DFO uses to evaluate vehicles that would serve as the standard for a particular class of vehicles. The criteria are weighted according to their relative importance. Additionally, each criterion gives preference to vehicles that respond positively to the policy concern that each criterion attempts to address.

FIGURE V: Fleet Purchasing Decision Tool



The criteria used and the preferences that are associated with them are:

1. *Cost Effectiveness*. Takes into consideration the total cost of the vehicle over its useful life, and gives preference to vehicles with lower lifetime costs.
2. *Air Quality Emissions*. Takes into consideration the amount of air pollution a vehicle emits and gives preference to vehicles with low emissions.
3. *Green House Gas Reduction*. Takes into consideration the amount of carbon dioxide a vehicle emits and gives preference to vehicles with low emissions.
4. *Available Infrastructure*. Takes into consideration the degree to which the infrastructure for the various sources of vehicle fuel is available and gives preference to vehicles that have access to an existing fuel network.
5. *Decreased Dependence on Foreign Oil*. Takes into consideration the amount of oil consumption for each vehicle and gives preference to vehicles that consume fewer barrels of oil annually.
6. *Federal EPACT Compliance*. Takes into consideration whether a vehicle complies with the Energy Policy Act of 1992 requirements and gives preference to vehicles that are capable of operating on non-petroleum fuels.
7. *American Made*. Takes into consideration the nation in which the vehicle is made and gives preference to vehicles that are American made.

DFO used the methodology described above to determine the standard vehicles for each vehicle class in the fleet for model year 2008. In choosing the vehicles for comparison, DFO selected vehicles which included the current class standard, other gasoline fueled vehicles that could be purchased, alternative fueled vehicles (CNG and ethanol), and hybrid electric-gas options in the class, if available.

The results of DFO’s analysis,²⁸ for example, showed the following vehicles to be the top choices in five major vehicle classes:

- Toyota Prius Hybrid – Compact Sedan²⁹
- Toyota Prius Hybrid – Midsize Sedan³⁰
- Ford Escape Hybrid – Compact SUV³¹
- Toyota Highlander Hybrid- Midsize SUV
- Chevrolet Silverado – Midsize Pickup Trucks³²

The fact that hybrid vehicles were the top choices for standard vehicles in several classes will result in the purchase of 167 hybrid vehicles in model year 2008. Table X shows that purchasing hybrids will result in the following benefits:

- reduce annual consumption of fuel by 33,340 gallons of fuel
- save approximately \$83,350 in fuel costs³³
- reduce carbon dioxide emissions by 296 metric tons annually
- remove the equivalent of 32 cars from Utah’s highways annually

TABLE X: Fuel and Emission Savings from Purchase of 167 Hybrid Vehicles

Financial and Environmental Impact State Fleet Purchase of Hybrid Vehicles Model Year 2008	
Savings/Reductions	Amount
Fuel (thousand dollars)	\$83.3
Fuel (thousand gallons)	33.3
Carbon Dioxide (metric ton)	296
Equivalent Number of Cars	32

To further ensure that vehicle choices were right sized, DFO, pursuant to the provisions of UCA §63A-9-401.5, required agencies to submit written justification for vehicle choices that deviated from established class standards, and for the Executive Director of DAS to review and approve agency choices. As a result, the replacement vehicles requested were vetted by the agency, DFO, and the DAS Executive Director. While the review process resulted in several requests for agencies to again review vehicle choices in light of the directive to right size state vehicles, the agency’s view of its operational needs was always a paramount consideration in approvals.

The focus on right sizing for the 2008 replacement cycle resulted in agencies downsizing 85 vehicles out of 656 vehicles due for replacement. DFO estimates that significant benefits will accrue to the state as a result of agencies deciding that they could

²⁸ APPENDIX J – Model Year 2008 Vehicle Comparisons by Class

²⁹ A very limited number of Honda Civic compact hybrids were available for purchase and the Toyota Prius was less costly than the Honda Civic.

³⁰ The industry classifies the Toyota Prius as a midsize sedan.

³¹ The Ford Escape Hybrid is currently not available for purchase by the state because of high demand in the private sector.

³² There are currently 6 classes in the Midsize Pickup Truck category. DFO is not purchasing the hybrid version of the Silverado because its air pollution score did not meet DFO minimum standards and the hybrid benefit was marginal in comparison to the incremental cost.

³³ Cost of fuel used in estimates is \$2.50/gallon.

conduct state business with smaller vehicles without impacting their operations in these 85 cases. Table XI shows that downsizing 85 vehicles will:

- save approximately \$99,600 from the generally lower prices that attach to smaller vehicles
- reduce fleet’s annual fuel consumption by approximately 76,929 gallons
- save approximately \$192,300 in fuel costs annually
- reduce carbon dioxide emissions by 682 metric tons annually
- remove the equivalent of 76 cars from Utah’s highways annually

TABLE XI: Fuel and Emission Savings from Rightsizing Fleet

Financial and Environmental Impact State Fleet Rightsizing Model Year 2008	
Savings/Reductions	Amount
Purchase Price (thousand dollars)	\$99.6
Fuel (thousand dollars)	\$192.3
Fuel (thousand gallons)	76.9
Carbon Dioxide (metric ton)	682
Equivalent Number of Cars	76

It should also be noted that 107 of the vehicles scheduled for replacement in the 2008 cycle will remain in the compact sedan class. An additional 102 vehicles are at the lowest level vehicle within their respective classes. Requested upgrades to 23 vehicles were deemed justified on the basis of operational needs.³⁴

DFO and Agencies Submitted Required Vehicle Efficiency Plans

As required by UCA §63A-9-401.5, DFO developed a statewide motor vehicle efficiency plan designed to assist state agencies in documenting their annual strategies to increase energy efficiency and provide a consolidated reporting mechanism to measure actual efficiencies achieved.³⁵ The statewide plan outlines agency responsibilities, submission deadlines, critical measures, as well as, cost reduction and efficiency strategies.

Almost all state agencies submitted individual fleet efficiency plans as required by statute. The “2007 State Fleet cost Efficiency Report” which contained each agency’s plans for improving energy efficiency was submitted to the Legislature on November 1, 2007. The individual plans submitted by each state agency may be found at:

<http://fleet.utah.gov/main/resources/hb110/State Fleet Cost Efficiency Report - Web.pdf>

³⁴ See, APPENDIX K – “Model Year 2008 Justification List Summary,” for further detail on the 2008 replacement cycle.

³⁵ APPENDIX L – Statewide Vehicle Fleet “Cost Efficiency Plan”

DFO was able to establish FY 2007 baseline data at the agency level³⁶ for:

- vehicle cost per mile
- total vehicles
- total fuel used
- miles per gallon of fuel

Establishing baseline data for each agency is critical for tracking progress towards a specific goal, over time, because the baseline measurement provides a barometer against which the state's progress can be compared on an annual basis. DFO's ability to rapidly establish baseline data is indicative of the fact that critical data on the state's motor vehicle fleet is centrally maintained. Years of experience by DFO and customer agencies has resulted in a comprehensive fleet information system that contains reliable vehicle data on every aspect of fleet operations. This allows DFO direct access to reliable information that is critical to establishing baselines and managing the state fleet.

Initiatives to Increase Use of Alternative Fuels

DFO has taken several steps to increase the use of alternative fuels in the state.³⁷ The division continues to monitor and report on use of CNG and E-85 (ethanol) in the state fleet. Data compiled since February 2007 shows that use of these particular fuels continue to be minimal. In the eleven month period between February and December 2007, the state fleet consumed an average of 1,890 CNG gallons per month. CNG consumption reached a high of 3,192 gallons in February 2007 and a low of 771 gallons in July 2007. Only one agency is choosing to use E-85, at an average of 106.2 gallons per month.

DFO made biodiesel fuel (B20) available to the fleet in May 2007 and use of B20 has exceeded use of other alternative fuels available to the fleet. In the eight month period that B20 has been available, the state fleet consumed an average of 9,976 gallons of B20 per month, although consumption dropped sharply in December 2007 to 1,919 gallons. Increased consumption of biodiesel fuel is one of the primary goals in the Department of Transportation's energy efficiency plan.

Finally, DFO has taken the steps necessary to ensure that the public is given the ability to purchase CNG at state fuel sites if it is economically feasible to do so. H.B. 103, which authorizes public use of the state's alternative fuel sites, passed both houses during the 2008 General Session.

³⁶ APPENDIX M – State Fleet Cost Efficiency Report 2007 Baseline Data: Administrative Services (example)

³⁷ APPENDIX N – Alternative Fuel Use

Agency-specific Energy Efficiency Projects

The need to improve energy efficiency has led state agencies to implement measures to assist in meeting the state's energy efficiency goals. State agencies have submitted energy efficiency plans as required by statute and executive order. Actions taken have run the gamut from emails informing employees of the benefits of conservation, to re-examining their business practices, to using renewable energy. The following provides more detail on some of the agencies' accomplishments.

Department of Administrative Services

The Department of Administrative Services, Executive Director's Office, created the "SEE" The Light! (State Employees Energy) program and launched it during the department's annual summer awards party in September 2007. DAS employees received energy saving tips from several speakers and a paper lunch bag, complete with a CFL bulb, an Energy Star brochure and a bookmark. Door prizes included energy saving faucets, shower heads, tire gauges and a hot water heater blanket. Employees were also invited to take the Energy Star, "Change a light, Change the World" pledge, thereby extending the impact of the program beyond the workplace. The event created a template for other agencies to use in their respective energy efficiency programs.

Significantly, the program was a cooperative effort between the department and other non-governmental entities. Support from Energy Star was crucial to the creation of the "SEE" the Light! Program. Further, representatives from Utah Clean Energy, the National Energy Foundation, Rocky Mountain Power, Questar and Utah Clean Cities Coalition attended and spoke to the employees about the benefits of conservation.

DAS, Division of Purchasing

The Division of Purchasing encourages suppliers to offer Energy Star certified products or products that meet Federal Energy Management Program standards for energy consumption. The Division also encourages suppliers to offer products that are produced with recycled materials, where appropriate. Purchasing website incorporates the Energy Star and the recycled product logo into the product offerings. Customers can choose to view only those products that meet the energy efficiency standards and link directly to the Energy Star website for more information.

DAS, State Mail and Distribution Services

As part of its efforts to increase fuel efficiency, State Mail and Distribution Services (State Mail), examined the feasibility of using electric powered vans and trucks for some of its routes. However, the agency went beyond simply analyzing whether electric powered vehicles would meet the needs of its programs. Rather, they began an in-depth re-examination of business practices as a means of improving energy efficiency.

State Mail's preliminary analysis suggests that they could reduce the number of route and post office stops by approximately 14 percent without a reduction in service to

customers. Reducing the number of route stops has the potential of saving the state \$97,000 annually in the form of reduced fuel and labor costs.

Reducing the number of stops made could lead to additional savings in both postage and utilities. By reducing the number of stops, routes could end by 4:00 p.m. This provides the state with two ways of saving money. First, it permits State Mail to reduce hours of operation by an hour, thereby reducing utility bills by \$2,433. Second, it provides State Mail with the opportunity to put more mail through the Optical Card Reader (OCR), which results in discounted postage rates

Department of Community and Culture

The State Historic Preservation Office, in the Division of State History, has implemented a green program for preserving and reusing old buildings. They follow the LEED standards for sustainable design and renovation when renovating existing and historic buildings. Meeting LEED standards helps save significant amounts of energy and greatly reduces greenhouse gas emissions. The first building nationally to be LEED certified, while also meeting the Secretary of Interior's standards for historic preservation, is the Scowcroft Building in Ogden.

Department of Commerce

The Department partnered with Utah Clean Energy, Rocky Mountain Power, and Questar Gas to present a "SEE The Light" program to its employees on December 4, 2007. Through this program:

- employees received training on reducing energy use in their homes, offices, and travel
- 148 employees pledged to replace 592 light bulbs in their homes with compact fluorescent bulbs; one CFL was provided to each employee who submitted a pledge
- employees received information about rebate programs offered by the utilities to encourage energy conservation
- employees received educational materials, brochures, and bookmarks, and some employees received door prizes such as low-flow faucets and hot water heater insulation blankets.

Department of Corrections

In 2006, the Department of Corrections (DOC) began reusing the geothermal spring located at the Draper Correctional Facility to heat 332,000 square feet of buildings. DOC estimates that using the spring:

- saves \$206,000 in natural gas costs annually
- reduces natural gas consumption by 368,955
- reduces CO2 production by 15 percent, thereby reducing GHG emissions by 4,689,933 tons per year

The department continues to look for ways to extend the use of the geothermal spring into more buildings to save even more for the State in future years.

Department of Environmental Quality

The Department of Environmental Quality's (DEQ) Green Team was established to engage all employees in an open and transparent process to improve DEQ's existing recycling, energy conservation, and Choose Clean Air programs and to identify new "greening" initiatives. The primary objective of the Green Team was to make DEQ a model for green government by establishing green policies with measurable goals, and tracking results. The Green Team approach:

- demonstrates executive leadership and commitment
- actively engages all employees in developing and implementing green policies
- provides a transparent and open process in vetting green policy options
- allows implementation of the objectives in a manner suited to each division's culture
- allows establishment of green policies with measurable results.

DEQ Energy Audits

Despite having completed many improvements to its buildings to enhance energy efficiency, DEQ requested that energy audits of its buildings be performed by Rocky Mountain Power in order to assess additional energy efficiency enhancements to meet the Governor's percent by 2015 goal. The audits provided DEQ with multiple state-of-the-art project options with detailed cost estimates, energy efficiency summaries, and estimated payback timeframe. DEQ retains sole discretion as to improvements to implement.

Department of Health

The Department of Health (DOH) is currently focusing its efforts on making the two warehouses that it operates more energy efficient. To that end, energy audits have been performed on the warehouses. Proposals contained in the audit, if accepted and implemented, would cost \$4,820 and result in annual savings of \$1000 in utility costs. Additionally, DOH would receive \$1,539 in incentives from Rocky Mountain Power. With incentives, the simple payback periods for the projects are estimated to be less than four years for one and less than six years for the other.

Department of Human Services

The Department of Human Services (DHS) has developed a multi-pronged approach to improve employee awareness of the critical role they play in achieving the state's energy efficiency goals. Information regarding energy conservation is provided to new employees as part of the department's New Employee Orientation program. Information packets containing the department's energy strategies and measures, pamphlets from DEQ on conservation in the home and office, and other related materials have been distributed by DHS facility managers for distribution in all DHS buildings and provide the basis for annual training received by current employees. DHS is also in the

process of identifying “Energy Officials” who will track compliance with the department’s goals and strategies in DHS occupied buildings.

Labor Commission

The Labor Commission plans to use a monthly employee newsletter that is distributed to all Labor Commission employees to provide information on energy conservation. Brief articles on energy efficiency, along with a request for input from the employees will appear on the front page of the newsletter. The Labor Commission is currently in the process of writing about six articles for publication.

National Guard

The National Guard has relied on wind energy to reduce some of the energy used at Camp Williams Training site in Riverton. Although in place prior to the energy efficiency initiative, the two wind turbines at Camp Williams generate enough power to:

- meet 22 percent of the camp’s energy requirement, and
- reduce Carbon Dioxide emissions by 2,915 tons

Department of Natural Resources

Over the last two years, the Department of Natural Resources (DNR) has chosen to downsize 32 one ton trucks to compact trucks. Table XII shows that right sizing vehicles can have a significant impact on efforts to improve fuel efficiency and air quality in Utah. According to DFO estimates, DNR’s decision to downsize 32 one ton trucks will:

- reduce annual fuel consumption by approximately 11,700 gallons annually
- reduce carbon dioxide emissions by 103 metric tons which is equivalent to removing 11 vehicles from Utah’s highways annually

TABLE XII: Savings from Rightsizing DNR Vehicles

DNR Rightsizing of Vehicles Annual Impact	
Savings/Reductions	Amount
Fuel (thousand gallons)	11.66
Btu (billion)	1.5
Carbon Dioxide (metric ton)	103
Equivalent Number of Cars	11

Utah State Tax Commission

The Utah State Tax Commission (USTC) relies on employee education as a means of meeting energy efficiency goals. The USTC plans to use roundtable discussions to gather information on energy saving measures that employees feel need to be implemented in the workplace. Various media, including but not limited to, e-mail,

posters, self-help classes, and guest speakers will be utilized to raise awareness and educate employees on energy saving methods in the workplace and at home.

Department of Technology Services

The Department of Technology Services (DTS), in cooperation with the DPGS and Western States Contracting Alliance (WSCA) has implemented a desktop and notebook computer standardization program. Standards embraced by DTS will require the purchase of computer equipment that meets the environmental criteria, including Energy Star compliance, established by the Electronic Product Environmental Assessment Tool (EPEAT).³⁸ Specifically, purchases will be limited to products that are rated EPEAT silver.³⁹ DTS estimates that that the state will save approximately 59,178,160 kWh annually by purchasing desktops, LCD monitors and laptops that meet EPEAT silver level requirements.

Department of Transportation

In October 2007, the Department of Transportation (DOT) installed a solar photovoltaic system at its Murray Maintenance Facility. DOT estimates that the system will provide 15 percent of the facility's energy requirements. DOT's limited experience with the system shows that additional inputs from the solar panels have reduced the demand component of their utility bill, which, has resulted in reductions in the facility's overall bill.

DOT also has the installation of an 1800 watt turbine at its Milford Maintenance Facility scheduled for March 2008. It is estimated that the wind turbine will produce approximately 15 percent to 20 percent of the stations power needs.

³⁸ The complete set of performance criteria includes 23 required and 28 optional criteria in eight categories. To be EPEAT registered, products must meet all the required criteria. Products may achieve a higher level by meeting additional optional criteria.

³⁹ Product must meet the 23 required criteria plus 50 percent of the optional criteria.

CONCLUSION

Increasing energy efficiency is an important goal for the State of Utah. State agencies have made significant efforts to respond to Executive and Legislative Branch directives to improve energy efficiency and achieve the state's long-term energy efficiency goal of "increasing energy efficiency 20 percent by 2015." The measures that agencies have instituted provide a solid foundation for the Energy Efficiency Initiative's long-term success. Together, the measures that have been put into practice provide the State of Utah with the organizational framework and necessary infrastructure critical to a coordinated effort to achieve the state's long term energy efficiency goal. Additionally, they provide the state with a comprehensive approach to aggressively reduce energy use and operating costs in state government.

However, achieving the goal of "increasing energy efficiency 20 percent by 2015" is, to a great extent, dependent on the amount of funding available. Projects that have been carried out by SBEEP show the critical role that funding will play in achieving the state's energy efficiency goal. The projects show that significant inroads toward the target will require the state to invest in making its facilities more energy efficient. State appropriations are required to fund personnel costs, investments in buildings, vehicles, and other energy programs. Nevertheless, current estimates also indicate that the costs incurred by the state in implementing energy efficient measures will, over time, not only yield monetary benefits that outstrip costs of the project, but also significantly reduce emissions.

APPENDIX A

EXECUTIVE ORDER

Improving Energy Efficiency

WHEREAS, the Utah Energy Efficiency Policy is designed to increase energy efficiency in the State of Utah;

WHEREAS, this policy is designed to promote improved energy efficiency in State facilities and encourages collaboration and support of private-sector initiatives;

WHEREAS, the policy sets forth a goal to increase energy efficiency by 20% by 2015;

WHEREAS, peak demand in the State is growing more rapidly than the need for base load electricity;

WHEREAS, the State purchases approximately \$60 million in electricity each year; and

WHEREAS, the State may pay more for electricity use in the summer;

NOW, THEREFORE, I, Jon M. Huntsman, Jr., Governor of the State of Utah,

1. Direct State employees to sign up for and heed PowerForward email alerts and adopt an ethic of energy conservation through simple electricity-saving measures in the workplace and at home. Examples of such measures include:

- * Replacing incandescent light bulbs with compact fluorescent ("CFL") bulbs
- * Setting air conditioning thermostats to a higher temperature setting
- * Using dimmers, motion sensors, or timing devices on appropriate light fixtures
- * Using "energy-saving" settings on all appliances
- * Running dishwashers and laundry equipment only when fully loaded

2. Order State facilities managers to adopt practical conservation practices and procedures. Examples of such measures might include:

- * Adjusting building temperatures
- * Significantly reducing building power usage during non-traditional work hours (as practicable for individual agency function)
- * Replacing incandescent light bulbs with CFL fixtures

3. Request that the Department of Environmental Quality, in conjunction with the electric utilities within the State, continue to provide simple and timely conservation alerts for the citizens and businesses of Utah to help maintain affordable electricity rates and ensure system reliability.

4. Require all cabinet members to submit annual reports to the Department of Environmental Quality regarding actions taken in response to PowerForward alerts, and regarding all efforts to achieve the State's 2015 energy efficiency goals.

5. Direct the Department of Environmental Quality to prepare for the Governor's review a comprehensive annual report regarding the functioning of and responses to PowerForward within each State agency, and regarding each agency's efforts to achieve the State's 2015 energy efficiency goals.

IN WITNESS, WHEREOF,
I have hereunto set my hand
and caused to be affixed the
Great Seal of the State of
Utah. Done in Salt Lake City,
Utah, this 30th day of May
2006.

(State Seal)

Jon M. Huntsman, Jr.
Governor

ATTEST:

Gary R. Herbert
Lieutenant Governor

2006/0004

APPENDIX B

63-9-63. Legislative findings and policy.

(1) The Legislature finds the following:

(a) The operation of facilities owned and controlled by the state consumes significant amounts of energy.

(b) Facilities owned and controlled by the state present a significant opportunity for energy cost savings through the implementation of conservation measures.

(c) Principles which produce efficient facility management in the private sector are equally applicable to the management of public buildings and facilities.

(d) There exists, in the private sector, favorable alternative methods of financing energy conservation measures which are not readily adaptable to financing state facility energy efficiency improvements due to current budgetary practices.

(e) Maximization of energy conservation efforts in light of limited resources requires careful advance planning by responsible agencies.

(2) The Legislature declares that it is the policy of the state to:

(a) undertake aggressive programs designed to reduce energy use in state facilities in order to reduce the operating costs of state government and to set an example of energy efficiency for the public;

(b) utilize, to the greatest practical extent, alternative funding sources and methods of financing energy efficiency improvements in state facilities in a manner which minimizes the necessity for increased appropriations;

(c) employ private sector management incentive principles, to the extent practicable, to implement the policies in Subsections (2)(a) and (b);

(d) develop incentives to encourage state entities to conserve energy, reduce energy costs, and utilize renewable energy sources where practicable; and

(e) procure and use energy efficient products where practicable.

APPENDIX C

63-9-67. State Building Energy Efficiency Program.

(1) For purposes of this section:

(a) "Division" means the Division of Facilities Construction and Management established in Section 63A-5-201.

(b) "Energy efficiency measures" means actions taken or initiated by a state agency that reduce the state agency's energy use, increase the state agency's energy efficiency, reduce source energy consumption, reduce water consumption, or lower the costs of energy or water to the state agency.

(c) "Energy savings agreement" means an agreement entered into by a state agency whereby the state agency implements energy efficiency measures and finances the costs associated with implementation of energy efficiency measures using the stream of expected savings in utility costs resulting from implementation of the energy efficiency measures as the funding source for repayment.

(d) "State agency" means each executive, legislative, and judicial branch department, agency, board, commission, or division, and includes a state institution of higher education as defined in Section 53B-3-102.

(e) "State Building Energy Efficiency Program" means a program established under this section for the purpose of improving energy efficiency measures and reducing the energy costs for state facilities.

(f) (i) "State facility" means any building, structure, or other improvement that is constructed on property owned by the state, its departments, commissions, institutions, or agencies, or a state institution of higher education.

(ii) "State facility" does not mean:

(A) an unoccupied structure that is a component of the state highway system;

(B) a privately owned structure that is located on property owned by the state, its departments, commissions, institutions, or agencies, or a state institution of higher education; or

(C) a structure that is located on land administered by the School and Institutional Trust Lands Administration under a lease, permit, or contract with the School and Institutional Trust Lands Administration.

(2) The division shall:

(a) develop and administer the state building energy efficiency program, which shall include guidelines and procedures to improve energy efficiency in the maintenance and management of state facilities;

(b) provide information and assistance to state agencies in their efforts to improve energy efficiency;

(c) analyze energy consumption by state agencies to identify opportunities for improved energy efficiency;

(d) establish an advisory group composed of representatives of state agencies to provide information and assistance in the development and implementation of the state building energy efficiency program; and

(e) submit to the governor and to the Capital Facilities and Administrative Services Appropriations Subcommittee of the Legislature an annual report that:

(i) identifies strategies for long-term improvement in energy efficiency;

(ii) identifies goals for energy conservation for the upcoming year; and (iii) details energy management programs and strategies that were undertaken in the previous year to improve the energy efficiency of state agencies and the energy savings achieved.

(3) Each state agency shall:

(a) designate a staff member that is responsible for coordinating energy efficiency efforts within the agency;

(b) provide energy consumption and costs information to the division;

(c) develop strategies for improving energy efficiency and reducing energy costs; and

(d) provide the division with information regarding the agency's energy efficiency and reduction strategies.

(4) (a) A state agency may enter into an energy savings agreement for a term of up to 20 years.

(b) Before entering into an energy savings agreement, the state agency shall:

(i) utilize the division to oversee the project unless the project is exempt from the division's oversight or the oversight is delegated to the agency under the provisions of Section 63A-5-206;

(ii) obtain the prior approval of the governor or the governor's designee; and

(iii) provide the Office of Legislative Fiscal Analyst with a copy of the proposed agreement before the agency enters into the agreement.

APPENDIX D

63A-9-401.5. Vehicle fleet cost efficiency plans -- Requirements -- Contents -- Submission by agencies.

(1) The division shall develop and coordinate the implementation of a statewide vehicle fleet cost efficiency plan to ensure continuing progress toward statewide overall cost reduction in government vehicle costs. The plan shall include:

- (a) goals for vehicle fleet cost efficiency;
 - (b) a summary of agency submitted plans, statistics, and progress;
 - (c) standard measures of cost including:
 - (i) vehicle cost per mile;
 - (ii) total vehicles;
 - (iii) total fuel used; and
 - (iv) miles per gallon of fuel;
 - (d) goals for purchasing the most economically appropriate size and type of vehicle for the purposes and driving conditions for which the vehicle will be used;
 - (e) cost reduction measures which may include:
 - (i) reducing vehicle engine idle time;
 - (ii) driving fewer miles;
 - (iii) using car pools when possible;
 - (iv) avoiding rush hour traffic;
 - (v) reducing aggressive driving;
 - (vi) providing proper preventative maintenance including properly inflated tires;
- and
- (vii) purchasing from state fuel sites and using the lowest octane fuel needed for the altitude;
 - (f) reducing inventories of underutilized vehicles; and
 - (g) education to inform drivers of their accountability on implementing cost reduction measures.

(2) The division shall assist agencies to develop and implement their own plans in accordance with this part.

(3) Each agency that owns or leases vehicles shall develop, implement, and submit to the division under Section 63A-9-402, a vehicle fleet cost efficiency plan for their agency in accordance with the provisions under Subsection (1). The plan shall include agency goals and statistics, and a report of agency progress.

APPENDIX E

3.0 DFCM REQUIREMENTS

These requirements are enhancements of code requirements that DFCM has initiated for best practices for State owned facilities.

3.1 General

A. Distributed Live Loads

(1) Modify IBC Table 1607.1 “Minimum Uniformly Distributed Live Loads and Minimum Concentrated Live Loads” by the following:

a. Increase the Uniformly Distributed Live Loads to 80 psf for: Office use in Access floor systems; Operating room, laboratories, private rooms, wards in Hospitals; Reading rooms in Libraries; Offices in Office buildings; Classrooms in schools.

b. Increase the Minimum Concentrated Live Loads to 2500 lbs for: Office use and Computer use for Access floor systems; Operating rooms, laboratories, corridors above the first floor for Hospitals; Reading rooms, Stack rooms, Corridors above first floor in Libraries; Lobbies and first-floor corridors, offices, corridors above first floor in Office Buildings; Classrooms, Corridors above first floor, First floor corridors in Schools.

B. Enhanced Accessibility

- (1) “It is the policy of the Utah State Building Board that, when appropriate for the intended use of the building and achievable within the project budget, the following accessibility enhancements beyond those required by the Americans with Disabilities Act be provided for in state owned buildings and buildings leased by DFCM: (1) powered door openers for the primary entrance designated for use by people with disabilities, and (2) powered door openers for one uni-sex restroom or for one male and one female restroom in the building unless restrooms with a door-less entry are provided. This policy is not intended to limit the use of powered door openers to the standard set forth herein. This policy applies to the construction or major renovation of state-owned facilities and new leases where the entire building is being leased by DFCM. This policy is not intended to create any rights to any third parties.
- (2) Determinations that one or both of these enhancements are not appropriate for the intended use of the building or not possible within the project or lease budget shall be made by the Director or his designee. Determinations of whether this enhancement to accessibility is appropriate should

consider the potential of access by people with disabilities. The Director may determine that powered door openers are appropriate for the primary entrance while not warranted or not possible within the budget for access to restrooms. The Director may also determine that one or both of these enhancements are not feasible in (a) the renovation of an existing building due to its design or configuration or (b) in a leased facility due to the nature and circumstances of the lease.”

C. Energy Efficient Products:

(1) Select, where life-cycle cost-effective, products that are in the upper 25 percent range of the energy efficiency rating. Energy efficient products include:

- a. Heating and cooling equipment;
- b. Motors;
- c. Lighting fixtures, compact fluorescent light bulbs, exit signs;
- d. Windows, doors and skylights;
- e. Roof products;
- f. Food service equipment;
- g. Transformers;
- h. Office equipment;
- i. Electronics; and
- j. Appliances.

(2) Exceptions:

- a. Energy efficient products that have been stipulated as life-cycle cost-effective by DFCM.
- b. ENERGY STAR® products that are certified and labeled through the US Environmental Protection Agency.
- c. Energy Efficient Products listed items on General Service Administration, GSA Advantage website. “Energy Efficient Products” mean items that meet Federal Energy Management Program (FEMP) energy efficiency levels as required by the Federal Acquisition Regulation (FAR) Subpart 23.203, Executive Order 13123, and Executive Order 13221.

D. Energy Design Standards:

(1) Buildings except Low-Rise Residential Buildings. Design facilities according to the applicable ANSI/ASHRAE/IESNA Standard 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings, (Standard 90.1) at the time submitted to the State Building Official for mandatory requirements and either

the prescriptive, simplified, or energy-cost-budget methods:

- a. Building Envelope Prescriptive Method. Design an integrated system of building envelope components to reduce the envelope performance factor by 10 percent or more to what is required by Standard 90.1. Submit the Envelope Compliance Certificate declaring the building envelope meets Standard 90.1 requirements using DOE Comcheck software or Appendix C of Standard 90.1. The certificate shall show the envelope is 10 percent better than Code.
 - b. Interior Lighting System Prescriptive Method. Design the interior lighting system to reduce the interior lighting power density by 10 percent or more to what is required by Standard 90.1 using either the whole-building or space-by-space methods of Standard 90.1. Submit the Lighting and Power Certificate declaring the lighting and power system meet Standard 90.1 requirements using DOE Comcheck software. The certificate shall show the lighting power is 10 percent better than Code.
 - c. Mechanical Systems Simplified Method. Design the HVAC system type to meet Standard 90.1 requirements. Submit the Mechanical Certificate declaring the mechanical systems meet Standard 90.1 requirements using DOE Comcheck software.
 - d. Energy-Cost-Budget Method (Optional). Design the building to save 20 percent or more of the annual energy cost using the energy-cost-budget method. The energy-cost-budget method is an optional method to the prescriptive or simplified methods. Submit the Energy-Cost-Budget report from the Standard 90.1 User Manual. The form shall show annual energy cost is 20 percent better than Code.
- (2) Low-Rise Residential Buildings. Design facilities according to International Energy Conservation Code for mandatory requirements and either the component or system analysis methods:
- a. Building Envelope. Design the building envelope to meet the envelope performance factor by 10 percent or more using the building envelope component performance approach. Submit the Envelope Compliance Certificate declaring the building envelope meets IECC requirements using DOE Rescheck software. The certificate shall show the envelope is 10 percent or more than Code.

b. System Analysis (Optional). Design the building to save 20 percent or more of the annual energy use according to system analysis method.

(3) Industrial, Laboratory, Research, and Other Energy-Intensive Facilities. Design industrial, laboratory, research, and other energy-intensive facilities or processes to reduce energy use by 10 percent or more over standard practice.

E. Hazardous Materials

(1) DFCM shall procure a qualified abatement consultant during the Schematic Design phase of the Design stage. The abatement consultant shall survey all renovation and demolition projects for hazardous materials such as asbestos-containing building materials, lead-based paint, mold, universal wastes such as PCBs, CFCs, mercury, household/janitorial cleaning products, identified/unidentified containers of chemicals or products, or any other materials or waste that may be environmentally unsafe.

(2) Prior to the start of a survey by the abatement consultant, the A/E shall provide drawings at the design development phase of the design stage to the abatement consultant with sufficient information to define the building or facility areas affected by the renovation or demolition. The abatement consultant shall coordinate abatement documents with the updated Contract Documents prior to final preparation. The abatement consultant shall prepare a complying and comprehensive hazardous materials survey report identifying and quantifying all hazardous and non-hazardous building materials to include asbestos-containing building materials, lead-based paint, mold and universal wastes that affect the areas of renovation or demolition.

(3) DFCM shall procure a qualified abatement contractor to remove all hazardous materials prior to the beginning of any building demolition or renovation.

F. Vibration

(1) Design structure in accordance with the following minimum requirements for vibration:

Space Category	Vibration Sensitivity
Laboratories with equipment sensitive to vibration	Comply with manufacturer's requirements for vibration.
Offices, classrooms, and other similar spaces.	There are no vibrations from machines or traffic which are detectable by people.
Common Area spaces.	There is occasional movement in the floor when heavy equipment are moved nearby.
Storage spaces.	There is obvious and annoying movement when people walk by or equipment is being moved nearby.

APPENDIX F

5.0 HIGH PERFORMANCE BUILDING RATING SYSTEM

5.1 General

- A. This section defines a High Performance Building Rating System for Buildings except Low-Rise Residential Buildings.
- B. If required by contract, a building shall comply with the Prerequisites (Section 5.5) and Energy Requirements (Section 5.6), and scores with 20 points or more with the Sustainability Credits (Section 5.7).

5.2 Definitions

“Agency” is any state agency, board, commission, department, or division.

“Designer” is the architect(s), engineer(s), and other professionals responsible for the building design.

“Institution” means the University of Utah, Utah State University, Southern Utah University, Weber State University, Snow College, Dixie State College of Utah, College of Eastern Utah, Utah Valley State College, Salt Lake Community College, Utah College of Applied Technology, and any other university or college which may be established and maintained by the state.

“Low-Rise Residential Buildings” means single-family houses, multi-family buildings of three stories or less above grade, and manufactured houses.

“Life-cycle costs” means the sum of the present values of investment costs, capital costs, installation costs, energy costs, operating costs, maintenance costs, and disposal costs, over the lifetime of the project, product, or measure.

“Life-cycle cost-effective” means the life-cycle costs of a product, project, or measure are estimated to be equal to or less than the base case (i.e., current or standard practice or product).

5.3 Referenced Standards and Codes.

The design shall comply with all applicable Standards and Codes at the time submitted to the State Building Official, including but not limited to:

ANSI/ASHRAE Standard 52.2, Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size

ANSI/ASHRAE Standard 55, Thermal Environmental Conditions for Human Occupancy

ANSI/ASHRAE Standard 62, Ventilation for Acceptable Indoor Air Quality.

ANSI/ASHRAE/IESNA Standard 90.1, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, including Appendix G.
Illuminating Engineering Society of North America, *IESNA Lighting Handbook*.

U.S. Green Building Council, *Leadership in Energy & Environmental Design for New & Major Renovations (LEED-NC)*.

5.4 Design and Technology Charrette

- A. DFCM may conduct a Design and Technology Charrette with the designers to review the requirements of the standard and strive for an integrated design of energy efficiency and environmental measures. In addition, the charrette shall also consider sustainable site design including:
- (1) Natural shade to reduce heat island effect from parking lots and landscaping areas;
 - (2) Shielded or reduced parking and façade lighting to reduce night sky pollution;
 - (3) Reuse of existing building to conserve our resources;
 - (4) Avoiding sewer and waterway contamination;
 - (5) Use local building materials and products to support local economy and reduce the environmental impacts from transportation;
 - (6) Encourage the use of public transportation;
 - (7) Protect wet-lands and green spaces; and
 - (8) Provide recycling center.

5.5 Prerequisites

- A. Fundamental Building Systems Commissioning. DFCM may engage a Commissioning Agent that is not an individual directly responsible for project design or employed by one of the designers. Commissioning Agent shall ensure that fundamental building components are installed and calibrated to operate as intended.
- B. Life-Cycle Cost Analysis. Designer shall use life-cycle cost analysis in making decisions about their investments in products, services, construction, and other projects to lower the State Government's costs and to reduce energy and water consumption.
- C. CFC Reduction in HVAC and Refrigeration Equipment. Designer shall select HVAC and refrigeration equipment without chlorofluorocarbons (CFC) based refrigerants.
- D. Ventilation Systems. Designer shall provide mechanical ventilation system according to Standard 62. Mechanical ventilation system shall have the capability to operate continuously during occupancy and designed not to be easily shut-down or otherwise defeated, such as blocked registers.
- E. Drainage Systems. Designer shall design surface grades, storm drainage system, HVAC system, and other systems to avoid accumulation of standing water around or in the building.

- F. Landscape and Irrigation Systems. Designer shall design landscape and irrigation systems according to DFCM Guidelines for Landscape & Irrigation Standard.
- G. Fundamental Lighting Design. Designer shall design the lighting system according to IESNA Lighting Handbook.
- H. Mold Prevention during Construction. Contractor shall ensure porous type building materials, such as wood, insulation, paper, and fabric, is kept dry to prevent the growth of mold and bacteria. Materials that have been affected by mold shall be abated or replaced. Building insulation that is damp or wet for 72 hours shall be replaced.
- I. Filtration Media Replacement before Occupancy. Contractor shall ensure that filtration media is replaced before occupancy.
- J. Thermal Comfort. Designer shall ensure that thermal comfort requirements are met according to Standard 55. Exceptions:
 - (1) Winter humidification is not required;
 - (2) Summer dehumidification is not required; and
 - (3) Upper temperature limit in natural ventilated buildings is not required.

5.6 Energy Efficiency Requirements:

- A. Energy Performance. DFCM may select an integrated system of components to reduce source energy use what is required by Standard 90.1.
 - (1) DFCM shall engage an Energy Specialist with 3 years of experience with hourly energy modeling. Energy Specialist is not an individual directly responsible for project design or employed by one of the designers. Energy specialist shall perform the energy analysis according to Appendix G of Standard 90.1. Energy Specialist shall prepare report according to DFCM template and shall specify which energy efficiency measure should be commissioned. Energy Specialist shall consider reducing energy use in each major categories: 1) lighting, 2) cooling, 3) heating, 4) pumps/cooling tower, 5) internal loads, and 6) external loads. Energy specialist should also consider the following technologies:
 - a. Daylighting;
 - b. Natural ventilation;
 - c. Evaporative cooling;
 - d. Demand-controlled ventilation using CO2 or occupancy sensors;
 - e. Green roof;
 - f. Ground source heat pumps;
 - g. Spectrally selective glazings;
 - h. Underfloor air distribution;
 - i. Radiant cold beam system; and
 - j. Displacement ventilation system.

- (2) Commissioning Agent shall ensure the selected energy efficiency measures are installed and calibrated to operate as intended.

B. Small Buildings Prescriptive Energy (Optional). For nonresidential buildings with 3 floors or less and 75,000 square feet or less, Designer may substantially design the Building Envelope, Lighting System, HVAC system, and Service Water Heating system according to the recommended performance levels shown in Tables 1 through 4 in compliance with Standard 90.1.

Table 1 – Small Buildings Prescription Energy Option: Building Envelope ⁽⁴⁾

Category	Component	Recommendation
Roof	Insulation entirely above deck	R-20 continuous insulation and Energy-Star® rated surface
	Metal building	R-13 + R-19
	Attic and other	R-38
	Single rafter (insulated flat or vaulted ceilings)	R-38 + R-5 continuous insulation
Walls	Mass (HC > 7 Btu/ft ²) ⁽¹⁾	R-11.4 continuous insulation
	Metal building	R-13+R-13
	Steel framed	R-13+ R-7.5 continuous insulation
	Wood frame and other	R-13 + R-3.8 continuous insulation
	Below-grade walls	R-7.5 continuous insulation
Floors	Mass	R-10.4 continuous insulation
	Steel framed:	R-30
	Wood framed and other	R-30
Slab	Unheated	None ⁽²⁾
	Heated	R-10 for 36 in.
Doors	Swinging	U-0.70
	Non-swinging	U-0.50
Vertical Glazing	Window-to-wall ratio (WWR)	40% maximum
	Overall thermal transmittance	U-0.42
	Shading Coefficient	SC-0.40 ⁽³⁾
	Exterior sun control (S, E, W only)	Projection Factor-0.5 ⁽⁵⁾
	Low-e coating	Emittance < 0.05
Orientation	$(A_{north} * SC_{north} + A_{south} * SC_{south}) > (A_{east} * SC_{east} + A_{west} * SC_{west})$	Area (A) and Shading Coefficient (SC) of the Window
Skylight	Percent of roof area	3% maximum
	Overall thermal transmittance	U-0.69
	Overall solar heat gain coefficient	SC-0.42

⁽¹⁾ Fully grouted CMU walls or 6 inch concrete walls qualify for a mass wall.

⁽²⁾ R-10 for 24 in. located in counties of Box Elder, Cache, Carbon, Daggett, Duchesne, Morgan, Rich, Summit, Uintah, and Wasatch.

⁽³⁾ SC-0.44 for glazing located on the street side of the street level with continuous overhang with projection factor of 0.5 (S, E, W only).

⁽⁴⁾ Reference documents: ASHRAE *Advanced Energy Design Guide for Small Office Buildings* and Standard 90.1.

⁽⁵⁾ Projection Factor = (Horizontal Projection) / (Height Above Sill)

Table 2 – Small Buildings Prescription Energy Option: Lighting

(1) In semi-heated or unheated spaces, use pulse start metal halide.

Category	Component	Recommendation
Interior Lighting	Lighting power density (LPD)	10% Savings over Standard 90.1
	Premium T8 lamps	≥ 3100 Lumens
	Premium T8 ballasts	BF ≤ 0.8
	Window daylighting controls	Dim within 12 ft of windows
	Skylight daylighting controls	Dim within 8 ft of skylight
	Occupancy sensors	Auto-off in non-24 hour rooms
	Ceiling reflectance	80%
	Wall and partitions reflectance	70%
	High or low bay lighting	High or low bay T5 ₍₁₎ fixtures

Table 3 – Small Buildings Prescription Energy Option: HVAC

Category	Component	Recommendation
HVAC	Air Conditioner (< 65,000 Btu/hr)	15 SEER
	Air Conditioner (≥ 65,000 Btu/hr and < 135,000 Btu/hr)	11.0 EER and 11.4 IPLV
	Air Conditioner (≥ 135,000 Btu/hr and < 240,000 Btu/hr)	10.8 EER and 11.2 IPLV
	Air Conditioner (> 240,000 Btu/hr)	10.0 EER and 10.4 IPLV
	Air Conditioner Water or Evaporatively Cooled	14.0 EER
	Heat Pumps (< 65,000 Btu/hr)	13 SEER (Cooling) 8.0 HSPF (Heating, Split System) 7.5 HSPF (Heating, Single System)
	Heat Pumps (≥ 65,000 Btu/hr and < 135,000 Btu/hr)	11.0 EER and 11.4 IPLV (Cooling) 3.4 COP (Heating, 47° OSA) 2.4 COP (Heating, 17° OSA)
	Heat Pumps (≥ 135,000 Btu/hr and < 240,000 Btu/hr)	10.8 EER and 11.2 IPLV
	Heat Pumps (> 240,000 Btu/hr)	10.0 EER and 10.4 IPLV
	Air Conditioner Water or Evaporative Cooled	14.0 EER
	Water-source heat pump	14.0 EER (Cooling) 4.6 COP (Heating)
	Semi-cooled spaces	Direct or Indirect Evaporative Cooling (< 25,000 cfm)
	Gas furnace (≤ 225,000 Btu)	80% AFUE or Et (Single Package AC) 90% AFUE or Et (Split AC)
	Gas furnace (> 225,000 Btu)	80% Ec
Boiler	Hot Water Boiler (≤ 300,000 Btu)	90% AFUE
Motors	All pump and fan motors (≥ 1 hp)	NEMA Premium Efficiency Motors
Economizer	Air conditioners and heat pumps (single package)	Cooling capacity > 54,000 Btu
Ventilation	Outdoor air dampers	Motorized control
Duct	Friction rate	0.08 in. w.c. per 100 feet
	Sealing	Sealing class B
	Insulation level	R-6

Table 4 – Small Buildings Prescription Energy Option: Service Water Heating

Category	Component	Recommendation
Service Water Heating	Gas storage	90% Et
	Gas instantaneous	0.81 EF or 81% Et
	Electric storage 12 kW	EF > 0.99 – 0.0012 x Volume
	Pipe insulation	1 in. (diameter < 1.5 in.) 1.5 in. (diameter > 1.5 in.)

5.7 Sustainability Credits

A. Daylighting Credits

(1) Daylighting. Designer shall use daylight as the primary lighting system for 40 to 90 percent of the space, excluding copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas. Daylight zones shall have a minimum Daylight Factor of 2 percent and a maximum illumination of 200 footcandles. "Daylight Factor" means the ratio of interior to exterior illumination. Design shall lower peak and annual cooling loads compared to a building meeting Standard 90.1.

a. The Commissioning Agent shall ensure the daylighting control system is installed and calibrated to operate as intended.

- 2 points Daylighting in 40 percent of the space.
- 3 points Daylighting in 52 percent of the space.
- 4 points Daylighting in 62 percent of the space.
- 5 points Daylighting in 74 percent of the space.
- 6 points Daylighting in 90 percent of the space.

B. Energy Credits

(1) Evaporative Cooling. Designer shall select the evaporative cooling system to reduce mechanical cooling by 15 percent based on calculation method of Appendix G, Standard 90.1. Design the HVAC controls to turn off the evaporative cooling system whenever the indoor humidity level exceeds 60 percent. It should be integrated with the air economizer system and mechanical cooling system:

a. The Commissioning Agent shall ensure the evaporative cooling system is installed and calibrated to operate as intended.

- 2 points Evaporative cooling system.

(2) Demand-Controlled Ventilation using CO2 Sensors. Designer shall select the ventilation system to have a means to automatically reduce outside air intake using CO2 Sensors according to Standard 62.

a. The Commissioning Agent shall ensure the Demand-Controlled Ventilation system is installed and calibrated to operate as intended.

- 1 points Demand-controlled ventilation system.

(3) Under floor Air Distribution. Designer shall provide an underfloor air distribution system with ceiling return or equivalent air displacement system, excluding copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas.

- 2 points Under floor air distribution system.

C. Renewable Energy Credits

(1) Renewable Energy. Designer shall select on-site renewable energy such as photovoltaic, wind, geothermal, and fuel cells utilizing biogas to reduce source energy use.

2 point	5 percent reduction in source energy use.
3 points	12 percent reduction in source energy use.
4 points	22 percent reduction in source energy use.
5 points	34 percent reduction in source energy use.
6 points	50 percent reduction in source energy use.

D. Indoor Air Quality Credits

(1) Low-Emitting Materials. Designer shall select adhesives and sealants, paints and coatings, carpet, and composite woods with low-emitting materials.

1 point	Select adhesives and sealants that meet USGBC LEED™ -NC, Credit 4.1, requirements.
1 point	Select paints and coatings that meet USGBC LEED™ - NC, Credit 4.2, requirements.
1 point	Select carpets that meet USGBC LEED™ - NC, Credit 4.3, requirements.
1 point	Select composite woods that meet USGBC LEED™ - NC, Credit 4.4, requirements.

(2) Pollutant Source Control. Designer shall design the HVAC system to vent pollution sources, minimize cross-contamination of chemical pollutants, avoid dust and microbial growth, and install rated filtration media.

1 point	Install source ventilation system to vent pollution sources such as copy rooms, chemical storage rooms, janitorial rooms, food preparation spaces, and other polluting activities. Install separation walls that extend to the structure to prevent cross-contamination.
1 point	Design HVAC system to avoid areas where mold and dust can accumulate, such as return plenums and fibrous ductwork.
1 point	Select MERV rated filters of 11 or greater according to Standard 52.2.

(3) Construction Indoor Air Quality Management Plan. Contractor shall ensure that Volatile Organic Compounds (VOC), dust, oils, and odors have been contained and removed before occupancy.

- a. Prior to installation of materials and products that emits VOC or odors, allow materials and products to off-gas in a well ventilated staging area. Remove any oil films and dust.
- b. During installation of materials and products that emits VOC or odors, use HVAC fans, open windows, or temporary fans to continuously ventilate the area until emissions dissipate, and

- protect porous materials with polyethylene vapor retarders.
- c. During dust producing activities (such as drywall installation and finishing), protect HVAC fans and ductwork from accumulating dust by turning off the fans and cover air grilles, registers, and other duct openings. Use temporary fans to ventilate the space.
- d. Prior to operating HVAC system, vacuum dust that has accumulated in HVAC fans, plenums, and ductwork with HEPA vacuum and remove any oil films from metal surfaces.
- e. Prior to substantial completion, vacuum carpet and other soft surface with HEPA vacuum.

- 1 point Construction Indoor Air Quality Management Plan
- 1 point Prior to occupancy and after Substantial Completion, flush building for 15 days with 100 percent outside air.

E. Commissioning and Training Credits

(1) Additional Commissioning. Commissioning Agent shall ensure the building is designed, constructed, and calibrated to operate as intended. Implement the following additional commissioning tasks beyond the Prerequisites Fundamental Commissioning requirements:

- a. Review and provide recommendations on the design document prior to issuing the construction documents.
- b. Review the contractor submittals relative to the systems being commissioned.
- c. Develop Recommissioning Plan to schedule commissioning activities to assure the building is continuously tuned to optimize performance.

- 2 points Additional commissioning.

F. Acoustics Credits

(1) Improve Acoustical Performance. Designer shall design work spaces to provide acoustic levels that limit excess noise from exterior sources, HVAC systems, and other sources.

- 1 point Acoustical level of 36 to 40 dBA background, and 0.6 second reverberating times or less.

- 2 points Acoustical level of 35 dBA background or less, and 0.6 second reverberating times or less.

G. Sustainable Material Credits

(1) Recycled Content. Designer shall select building products that have incorporated recycled-content in major materials from the Construction Products category of the US Environmental Protection Agency (EPA) Comprehensive Procurement Guidelines. Major materials include parking areas, floor, roof, partition, walls, or serving a structural function throughout the building.

- 1 point Four to seven major materials with recycled-content.
- 2 points Eight or more major materials with recycled-content.

H. Waste Reduction Credits

(1) Site Waste Reduction. Contractor shall ensure that construction waste, demolition, and land clearing waste are recycled, composted, and salvaged. "Recycle Rate" is the ratio of recycled waste (by weight) to total waste (by weight).

- 1 point Recycle Rate of 50 to 74 percent.
- 2 points Recycle Rate of 75 percent or greater.

I. Water Reduction Credits

(1) Water Efficient Fixtures and Appliances. Designer shall select water-efficient, fixtures and appliances with maximum flow shown below:

- a. Sensor faucet, 0.5 gpm
- b. Showerhead, 1.5 gpm
- c. Sensored flushometer toilet, 1.1-1.3 gpf, or dual flush valve
- d. Waterless or ultra-low flow urinal, 0.5 lpf

2 points Water efficient fixtures and appliances.

J. Performance Measurement and Verification Credits

(1) Building Performance Monitoring on Multi-Building Campus. On a multibuilding campus, agencies and institutions shall meter each energy type for each building. Energy type includes electricity, natural gas, central chilled water, central heating water, and central steam. The energy management system shall the capability to monitor and log sub-metering energy use and electrical demand. Provide sub-meter water use on landscaping and other irrigation strategies.

1 point Building performance monitoring on multi-building campus.

(2) System Performance Monitoring. Designer shall provide continuous metering equipment for the following equipment performance shall the capability to monitor and log equipment performance:

- a. Lighting system (kWh and kW)
- b. Motor loads >20 hp (kWh and kW)
- c. Variable speed drive operation
- d. Chiller efficiency or chiller plant efficiency (i.e. chiller, cooling tower and pumps)
- e. Air and water economizer operation

- f. On variable volume system, supply air static pressure and volume
- g. Boiler efficiency or boiler plant efficiency (i.e. boiler and pumps)
- h. Process loads (kWh and kW) 1 point System performance monitoring.

K. Innovation in Design

- (1) The Director of DFCM, based on justified recommendations by the Energy Manager, may award up to 4 additional points for exceptional energy or environmental measures not specifically address in the rating system.

1 to 4 points Exceptional energy or environmental measures.

5.8 Submittals

- A. DFCM shall establish letter templates to document compliance with the High Performance Building Rating System used by the designers, contractors, agencies, institutions, commissioning agents, and energy specialists.

APPENDIX G

Table 2: Consolidated Phase I & II Annual Guaranteed and Actual Savings Comparison

Year	Guaranteed Energy Savings	Actual Energy Savings	Guaranteed Water Savings	Actual Water Savings	Guaranteed Solid Waste Savings	Actual Waste Savings	Actual Total Savings
0	\$ 109,488	\$ 107,279	\$ 72,812	\$ 130,163	\$ 8,954	\$ 8,954	\$ 246,396
1	\$ 379,954	\$ 189,564	\$ 172,856	\$ 205,361	\$ 19,829	\$ 19,829	\$ 414,754
2	\$ 534,738	\$ 346,473	\$ 190,636	\$ 192,139	\$ 20,491	\$ 20,491	\$ 559,103
3	\$ 552,598	\$352,113	\$ 197,003	\$196,300	\$ 21,176	\$21,176	\$569,588
4	\$ 571,055		\$ 203,583		\$ 21,883		\$
5	\$ 590,129		\$ 210,383		\$ 22,614		\$
6	\$ 609,839		\$ 217,409		\$ 23,369		\$
7	\$ 630,208		\$ 224,671		\$ 24,150		\$
8	\$ 651,257		\$ 232,175		\$ 24,956		\$
9	\$ 673,008		\$ 239,930		\$ 25,790		\$
10	\$ 695,487		\$ 247,944		\$ 26,651		\$
11	\$ 718,717		\$ 256,225		\$ 27,541		\$
12	\$ 742,721		\$ 264,783		\$ 28,461		\$
13	\$ 767,529		\$ 273,627		\$ 29,412		\$
14	\$ 793,164		\$ 282,765		\$ 30,394		\$
15	\$ 819,656		\$ 292,210		\$ 31,409		\$
16	\$ 847,032		\$ 301,970		\$ 32,458		\$
17	\$ 875,323		\$ 312,056		\$ 33,542		\$
18	\$ 904,558		\$ 322,479		\$ 34,663		\$
19	\$ 934,770		\$ 333,249		\$ 35,820		\$
20	\$ 452,616		\$ 300,999		\$ 37,017		\$
Total	\$13,853,848	\$996,165	\$5,149,765	\$723,963	\$ 560,580	\$70,450	\$1,790,577

Source: Utah Department of Corrections – FY07 Performance Contract Value Report p.6

APPENDIX H

ENERGY EFFICIENCY RESOURCE TEAM	
Agency	Contact(s)
Administrative Offices of the Courts	Alyn Lunceford, Myron March
Administrative Services	Curtis Clark, Bruce Whittington
Agriculture	Gordon Brown
Alcoholic Beverage Control	John Freeman, DiAnn Andreason
Commerce	Thad Levar
Community and Culture	Annette Babisz, Bonnie Mortensen, Scott Brooks, Michael Johnson, Wilson Martin
Corrections	Mike Haddon
State Office of Education	Janet Medrano,
Environmental Quality	Leah Ann Lamb, Daryl Cramer
Health	Kim Wixon
Human Resource Management	Jean Mills, Letty Debenham
Human Services	Keith Davis
Insurance	Doyle Christensen, Jilene Whitby
Labor Commission	David Lamb
National Guard	Ricy Jones
Natural Resources	Dennis Carver
Public Safety	Joe Brown
Tax Commission	Jeff Bawden
Technology Services	Russell Smith, William Shiflett
Transportation	Tracy Conti
Workforce Services	Ray Caldwell

APPENDIX I-1

UTAH STATE COURTS ADMINISTRATIVE OFFICE OF THE COURTS OFFICE ENERGY CONSERVATION, EFFICIENCY MEASURES AND STRATEGIES

The Administrative Office of the Courts (AOC) understand the value of conserving energy and promoting energy conservation and efficiency in the ongoing operations and long term management of its facilities. The AOC also believes that everyone including Courts employees should be informed of any energy conservation and efficiency that could be applied to their everyday lives. The AOC has identified several areas to invest time and energy into that will reduce energy consumption and promote conservation.

Facility Construction and Improvement Projects Measures and Strategies

The AOC will continue working with the Division of Facilities Construction and Management's (DFCM) to gather information on and identify energy conservation and efficiency projects in all Court facilities. The AOC is working with DFCM to comply with the current standards for new construction and will continue to identify projects that increase the energy efficiency of existing facilities by:

- A. Identifying improvement projects that will make buildings more energy efficient like installing more efficient lighting systems that are motion and time sensitive
- B. Budget for replacement of lamps or fixtures to accommodate CFS's
- C. Include energy conservation and efficiency into the prioritization for Capital Improvement Funding
- D. Identifying projects that are energy conservation projects.

The AOC will continue to work with the DFCM energy group on all our projects.

Facility Operation and Management Measures and Strategies

Work with DFCM's Facilities Management group to improve energy conservation and efficiency through facility management such as:

- A. Install programmable thermostats
- B. Prioritize and coordinate projects with DFCM Facility Management to maximize energy conservation
- C. Evaluating personal work areas to minimize energy consumption
- D. Make sure vents are not blocked by furniture or other obstructions
- E. Make sure thermostats are free from obstructions and items that generate heat
- F. Reduce light levels where ever possible
- G. Add occupancy sensor switches where appropriate
- H. Enhance awareness by providing training opportunities on best energy practices to staff
- I. Send periodic messages about energy efficiency via e-mail reminders and other communication channels

- J. Minimize hours and illumination levels of exterior lighting
- K. Participate in DFCM approved Building Managers' Operation Certificate program.

Personal Work Areas and Habits Measures and Strategies

Promote awareness of energy conservation issues in personal work areas such as:

- A. Turn off printers when not in use
- B. Turn off monitors when not in use
- C. Work with Courts IT to ensure Energy Star® power down features are activated
- D. If computers do not have Energy Star® features available, turn them off when leaving the office for more than 30 minutes
- D. Turn off your computer and monitors at the end of the day if possible
- E. Turn off photocopier at night or purchase copier with low standby feature
- F. Purchase printers and fax machines with power management feature and use it
- G. Encourage staff to turn off personal appliances such as fans, space heaters, radios and coffee pots when not in use
- H. Coordinate with vending machine vendor to install Energy Star® vending machines
- I. Promote the use of mass transit services.

Energy Awareness information Measures and Sources

1. Partner with outside entities to raise energy conservation/efficiency awareness, like the "See" the Light Program sponsored by DAS.
2. Encourage employee participation creating, developing and implementing energy saving initiatives such as the "Green" Team. <http://www.greenchoices.utah.gov/>
3. Encourage recycling by providing containers in employee break rooms and work rooms.
4. Enhance awareness by providing training opportunities on best energy practices.
5. Send periodic messages about energy efficiency via e-mail reminders and other communication channels. (Posters, updates at all-hands-meetings, brown bag)
6. Encourage employees to sign up for generated emailing regarding energy conservation practices and updates from state energy offices.
http://www.eere.energy.gov/state_energy_program/update/subscribe.cfm
<http://geology.utah.gov/sep/php/mailform.php>

SUMMARY

The Utah State Administrative Office of Courts will work with DFCM to evaluate each building and determine what energy conservation and efficiency measures can provide the best long term return, and use this information to establish the most effective course of implementation.

The AOC is working with landlords to encourage them to adopt similar energy conservation and efficiency programs for leased Facilities.

APPENDIX I-2



DEPARTMENT OF ADMINISTRATIVE SERVICES ENERGY EFFICIENCY PLAN January 2008

Introduction

The Department of Administrative Services (DAS) is committed to achieving the state's goal of increasing energy efficiency 20 percent by 2015. This document outlines strategies to be implemented to improve energy efficiency within the department.

Employee Awareness

Administrative Services will encourage employees to reduce energy consumption by fostering awareness of the energy efficiency initiative and the potential benefits of conservation through an awareness campaign that includes the measures outlined below:

1. "See" the Light Program – a department wide presentation on the benefits of energy conservation conducted in partnership with conservation advocacy groups and public utilities.
2. Engage and encourage employee participation by establishing a task force to recommend and implement energy efficiency policies and measures.
3. Enhance awareness by periodically providing information on energy efficiency and training opportunities on best energy practices.
4. Provide new employees with information packets on energy efficiency initiative and the benefits of conservation.
7. Implement Recognition/Awards program for outstanding contributions to energy efficiency

Office Best Practices

DAS will enhance employee awareness of best practices in office energy conservation and encourage use of the following measures to reduce energy consumption.

I. Lighting Measures

1. Replace incandescent lights with compact fluorescent lights (CFL) for desk lamps and overhead lighting
2. Encourage employees to:
 - Turn off lights when they leave at night
 - Turn off lights when leaving areas for any period of time
 - Use daylight instead of electric light whenever possible
 - Use task lighting and turn off general lighting where feasible to maintain sufficient lighting levels for safety and productivity
 - Use Energy Star® products
 - Turn off display and decorative lighting
3. Whenever possible, use the stairs instead of the elevator

II. Personal Computers and Appliance Measures

1. Turn off computers, monitors and printers at the end of the day if possible.
2. Ensure computer energy saving features are activated
3. Turn off photocopier at night or purchase copier with low energy standby feature. Purchase printers and fax machines with power management feature and use it.
7. Avoid using personal appliances such as fans, space heaters, radios and coffee pots are turned off.
8. Coordinate with vending machine vendor to install Energy Star® vending machines

III. Heating and Cooling Measures

1. Keep blinds drawn during a hot summer day; open them during the sunny part of a winter day
2. Allow casual attire to make higher temperatures more acceptable
3. Consider modifying or reducing operating hours when appropriate to avoid peak demand periods and reduce the number of hours the building is operational
4. Make sure vents are not blocked by furniture or other obstructions

Facility Management Measures

DAS will consult DFCM on measures that provide the best means to maximize energy efficiency in state-owned facilities used by the department to minimize energy consumption.

1. Encourage the installation and occupancy sensor switches where appropriate to minimize the period that lights are on unnecessarily.
2. Ensure facility heat and cooling settings are maintained within guidelines to insure facilities are comfortable during hours of operation. If possible, adjust building temperature settings during non-work hours to economically efficient non-occupied heating and cooling levels with ramp up for work hours.
3. Modify hours of janitorial work to minimize cleaning time outside of normal operating hours
4. Ensure DFCM facilities managers participate in DFCM-approved building managers' operation certificate program when available.
5. Minimize hours and illumination levels of exterior lighting
6. Tune up air handling units by:
 - a. Cleaning and adjusting belts
 - b. Cleaning diffusers and making sure they are open
 - c. Optimize fan speed
8. Tune up chilled water systems by;
 - a. Making sure temperature settings are appropriate
 - b. Verifying on/off schedule for circulating pumps
 - c. Verifying redundant systems are operating correctly
 - d. Controlling off of cooling load instead of outside air
9. Reduce hot water temperature settings where possible

Motor Vehicle Efficiency

Administrative Services will encourage employees to increase fuel efficiency of vehicles under its control by instituting measures outlined below:

- 1) Purchasing the most economically appropriate size and type of vehicle for operational needs and driving conditions
- 2) Provide Drivers with training on best driving practices

3) Revise business practices, when feasible, to reduce intrastate travel

- a. Permit telecommuting where appropriate
- b. Use teleconferencing when appropriate
- c. Promote carpooling or ridesharing

4) Promote use of mass transit. Utah Transit Authority ECO Passes are provided to employees at a subsidized rate

APPENDIX I-3

Utah Department of Agriculture & Food Office Energy Conservation & Efficiency Measures 2008

Lighting Measures

Department employees will be turning off lights, their printers, monitors and computers if they are going to be away for several hours and/or leaving for the day (includes employees located in offices throughout the state). Employees working in the Agriculture & Food Building (William Spry) Salt Lake Office will be turning off lights in their work area, hall lights, etc. when leaving for the work day.

An e-mail was sent to all department employees informing them of the energy efficiencies to be taken.

The Department will be taking a look at additional energy savings that can be used.

Vehicle Cost Efficiency Plan 2008

The Utah Department of Agriculture & Food had each division provide a plan for their respective divisions. It has been agreed upon that the following goals are to be implemented for our agency.

Goal 1: Promote proper tire inflation.

Suggestions:

- Send out e-mail reminder to drivers to check tire pressure
- Purchase tire pressure gauges for all department assigned vehicles

Goal 2: Vehicle Operations

- When possible avoid rush hour traffic
- Use cruise control to gain the most efficiency from the vehicle
- Keep with the posted speed limits. No aggressive driving habits, watch for the other driver.

Suggestions:

- Offer a “Driving for Efficiency” training course
- Use lowest grade octane required by the vehicle recommendations.
- Review & evaluate department inventory for efficiency and effectiveness in the intended or projected use.
- When possible fuel at state sites.

Goal 3: Share usage of the department vehicles

- House the vehicle at department headquarters to eliminate cost of commute to employee's homes when possible.
- Share use by department to allow each staff member to have access to a state vehicle when needed, which allows the vehicle to be used by several employees.

Suggestions:

- Share fleet vehicles parked at the department

Goal 4: Maximize off-highway efficiency

- Use horses or ATV's whenever practical to reduce fuel consumption
- Minimize hauling heavy loads or towing trailers unless needed.
- Camp whenever feasible if working far from home (e.g. high in the mountains) to avoid putting excessive miles on vehicle.

A memo was sent to all employees to provide tips to be used at home:

Conservation tips include:

- Replace incandescent light bulbs with Compact Fluorescent Light bulbs.
- Set air conditioning thermostats to a higher setting in the summer, and furnace at lower settings in the winter.
- Use dimmers, motion sensors, or timing devices on appropriate light fixtures.
- Use "energy-saving" settings on all appliances.
- Run your dishwasher and laundry equipment only when fully loaded. Replace incandescent light bulbs with Compact Fluorescent Light bulbs.
- Set air conditioning thermostats to a higher setting in the summer, and furnace at lower settings in the winter.
- Use dimmers, motion sensors, or timing devices on appropriate light fixtures.
- Use "energy-saving" settings on all appliances.
- Run your dishwasher and laundry equipment only when fully loaded.

APPENDIX I-4

Curtis James Clark
Division of Facilities and Construction Management
4110 State Office Building
Salt Lake City, Utah 84114

Re: Energy Efficiency Plan for the Department of Alcoholic Beverage Control Campus

Dear Mr. Clark:

The Department of Alcoholic Beverage Control Campus consists of three (3) buildings. The Main Office Building 21,500 sq. ft, the Main (old) Warehouse 118,000 sq. ft., ASRS (new addition) warehouse 16,750 sq. ft. by 110 ft. tall and the Club and Restaurant Store #33 18,000 sq. ft. The natural gas and electricity that are paid for the three buildings is billed on one billing amount.

The usage is as follows:

Fiscal Period	Natural Gas	Cubic Feet	Electric	MWH	Grand Total
12/1/06	\$ 8,653.80	328,138.5	\$ 9,398.18	167.1	\$ 18,051.98
1/1/07	15,619.44	61,501.4	10,485.02	186.7	26,104.46
2/1/07	13,199.92	57,873.4	9,862.43	166.6	23,062.35
3/1/07	8,601.37	33,180.3	10,035.74	172.6	18,637.11
4/1/07	1,748.69	5,024.1	9,117.51	153.5	10,866.20
5/1/07	1,620.55	1,338.5	10,094.97	161.5	11,715.52
6/1/07	761.38	552.8	14,359.86	185.8	15,121.24
7/1/07	46.80	426.8	16,772.58	218.1	16,819.38
8/1/07	363.69	329.8	18,037.53	262.8	18,401.22
9/1/07	258.03	678.9	16,731.13	231.5	17,089.16
10/1/07	2,526.23	8,826.1	14,228.00	185.5	16,754.23
11/1/07	2,176.96	17,555.2	10,759.73	174.5	14,400.42
Grand Total	\$ 57,040.59	220,118.8	\$ 149,982.68	2,266.2	\$ 207,023.27

The Department of Alcoholic Beverage Control is implementing strategies to improve our energy efficiency. They are as follows:

1. Organize an Energy Efficiency Committee to meet quarterly
2. The Executive Director will issue a mandate that all perimeter offices with natural lighting will turn off interior lighting when feasibly possible.
3. Replace manual light switches with motion detection switches in the workout room, lunch room, bathrooms, copy rooms, and file rooms.
4. Keep roll down doors closed in warehouse and club store when not in use.
5. The ASRS (Automatic Storage and Retrieval System) area in the warehouse usually has no personnel in it. Shut lights off except when personnel are present.
6. As fleet vehicles need to be replaced they will be replaced, when feasible, with hybrid vehicles.

7. Purchase mass transit passes for employees that request them. Encourage all employees to use them.

Please let me know if additional information is needed.

Thank you,

DiAnn Andreason
DABC Training Coordinator

APPENDIX I-5

OFFICE ENERGY CONSERVATION AND EFFICIENCY MEASURES

Department of Commerce

1/3/2008

Lighting Measures

Heating and Cooling Measures

Facility Management Measures

The Department of Commerce is housed 100% in facilities managed by the Division of Facilities and Construction Management. DFCM's management of the facilities includes the installation of lighting, use of motion-activated light switches to reduce excess use, and management of building heating and cooling. Building energy use is reported through DFCM.

Personal Computers and Appliance Measures

1. All Department employees have received training about turning off computers, printers, and monitors when not in use.
2. Photocopy machines throughout the Department are either turned off at the end of the workday or equipped with a power management feature.
3. Recent remodels within the Heber Wells Building have resulted in more efficient use of community break areas with refrigerators and microwaves, reducing the need for personal electrical items.

Heating and Cooling Measures

1. All employees with windows have working blinds to help monitor and modify office temperatures.
2. The Department allows casual attire on Fridays when work requirements, meetings, or hearings do not require otherwise.
3. The majority of Department operations occur during normal business hours, with very little building occupancy on evenings or weekends.
4. The Department annually audits furniture and other items to ensure there is adequate free space below all ceilings and no vents are blocked.

Energy Awareness Measures

The Department partnered with Utah Clean Energy, Rocky Mountain Power, and Questar Gas to present a "SEE The Light" program to its employees on December 4, 2007. Through this program:

1. 148 employees pledged to replace 592 light bulbs in their homes with compact fluorescent bulbs. One CFB was provided to each employee who submitted a pledge.
2. Employees received training on reducing energy use in their homes, offices, and travel.
3. Employees were educated about rebate programs offered by the utilities to encourage energy conservation.
4. Employees received educational materials, brochures, and bookmarks, and some employees received door prizes such as low-flow faucets and hot water heater insulation blankets.

Driving Measures

1. Driving Fewer Miles

Department managers encourage employees to efficiently plan destinations and appointments throughout the day to minimize unnecessary mileage. Additionally, a recent change involved moving one investigator from Salt Lake City to St. George. In the last year one Division's investigators have driven approximately 36,000 miles from Salt Lake City to St. George or other Southern Utah destinations. To mitigate miles driven too and from Southern Utah the Department has decided to move an investigator to St. George to oversee prescription drug cases in that area. This will eliminate thousands of miles driven to Southern Utah annually.

2. Right Sizing Vehicles

The Department of Commerce has historically driven exclusively Mid-size vehicles. With the exception of the six vehicles used for off road driving, the Department intends to replace all Mid-size vehicles with compact vehicles. The cost and energy savings from this measure alone will increase MPG and therefore cost efficiency by more than 20% in ensuing years as vehicles are replaced (assuming they are replaced with compact hybrids).

3. Promotion of Efficient Driving

The following techniques are emphasized by Department managers to encourage drivers to be cognizant of cost and energy savings:

- Promoting safe and efficient speeds
- Encouraging use of Cruise Control
- Turning vehicles off when idling for even a short time, and restarting
- Using Correct grade of motor oil and correct tire pressure

4. Mass Transit

All employees who choose to use mass transit to commute to work are reimbursed for the purchase of their transit passes.

5. Recent Measures

-A vehicle that was being under utilized by the division, to which it was assigned, is now being shared by individuals in three different divisions who have almost altogether been

able to stop renting daily pool vehicles from Enterprise, and kept the department from needing to request an additional vehicle.

-One of our investigations managers who was commuting, but spending most of his time at the office has stationed the division vehicle at the office and no longer commutes in it.

APPENDIX I-6



Energy Efficiency Plan

Introduction

As part of Governor Huntsman's Energy Efficiency Initiative, the Utah Department of Community and Culture (DCC) is committed to the overall goal of reducing energy consumption and improving energy efficiencies 20% by the year 2015 in the buildings that comprise our department. Being proactive in this regard not only will save Utah taxpayers money, but will help reduce the carbon footprint and have long-term benefits on our environment. This plan addresses efficiencies in three target areas -- building facilities, motor pool, and human behavior.

DCC operates out of six buildings in various locations throughout downtown Salt Lake City, nearly all of which are owned by the State and managed by the Division of Facilities and Construction Management (DFCM):

1. 324 South State Street – Shared office space for DCC Admin, Division of Housing and Community Development, Division of Indian Affairs, Office of Ethnic Affairs, and the Governor's Office of Economic Development
2. Library Building – Division of State Library and Library for the Blind and Disabled
3. Rio Grande Depot – Division of State History, Division of Arts & Museums
4. The Glendinning Home – Division of Arts & Museums
5. The Art House – Division of Arts & Museums
6. The Chase Home – Division of Arts & Museums

The Chase Home is owned by the City of Salt Lake, and therefore the only building of ours that is not managed by DFCM. We are working the building manager to inform them of the Governor's Initiative and to recommend they incorporate energy conservation and efficiency measures.

Our Energy Resource Team, comprised of representatives from divisions who oversee their respective facilities, has been tasked with developing the plan, implementing the recommendations, creating awareness among their staff, and reporting progress to division directors.

Building Efficiency

- Adjust building temperature settings for non-working hours, weekends and holidays, with a ramp-up for normal business hours. This will help minimize consumption and reduce heating/cooling costs.
- Regulate and encourage the use of low-wattage space heaters approved by DFCM and building management. By allowing employees to better control the temperature of their offices, rather than warm up the entire building, we will not waste heat in hallways, break rooms, and common areas for printing and mail services.

- Install motion sensor lights in common areas such as break rooms, conference rooms and restrooms. These are areas where lights are typically left on when not in use.
- Replace incandescent light bulbs with compact fluorescent light (CFL) in all facilities. This will ensure the most efficient lighting is installed and being utilized.
- Request that lights in offices, hallways, meeting rooms and other areas be turned off by the janitors and cleaning crews when they are finished with their services. This will help ensure the lights are not kept on unnecessarily throughout the night.
- Turn off photocopy machines at the end of the business day, or make sure they are equipped with a power saver feature.
- Evaluate individual use of high energy appliances such as coffee makers, small refrigerators, microwaves, etc. and recommend employees better utilize shared resources in break rooms that have been updated with energy star appliances.

Motor Pool Efficiency

- Encourage employees to efficiently plan travel to meetings and events. This will help minimize unnecessary mileage and gas consumption.
- Reserve the right size vehicle for the number of passengers and terrain or destination. By maximizing this efficiency, the number of MPG per person will be reduced.
- Encourage drivers to be cognizant of cost saving measures, such as driving efficient speeds, utilizing cruise control for distance driving, turning vehicles off rather than idling, using correct grade of motor oil, ensuring correct tire pressure, etc.
- Promote the use of public transportation to commute to work and offer employees a discounted or free UTA ECO pass. This will help reduce the number of vehicles on the road and help improve air quality downtown.

Human Behavior Efficiency

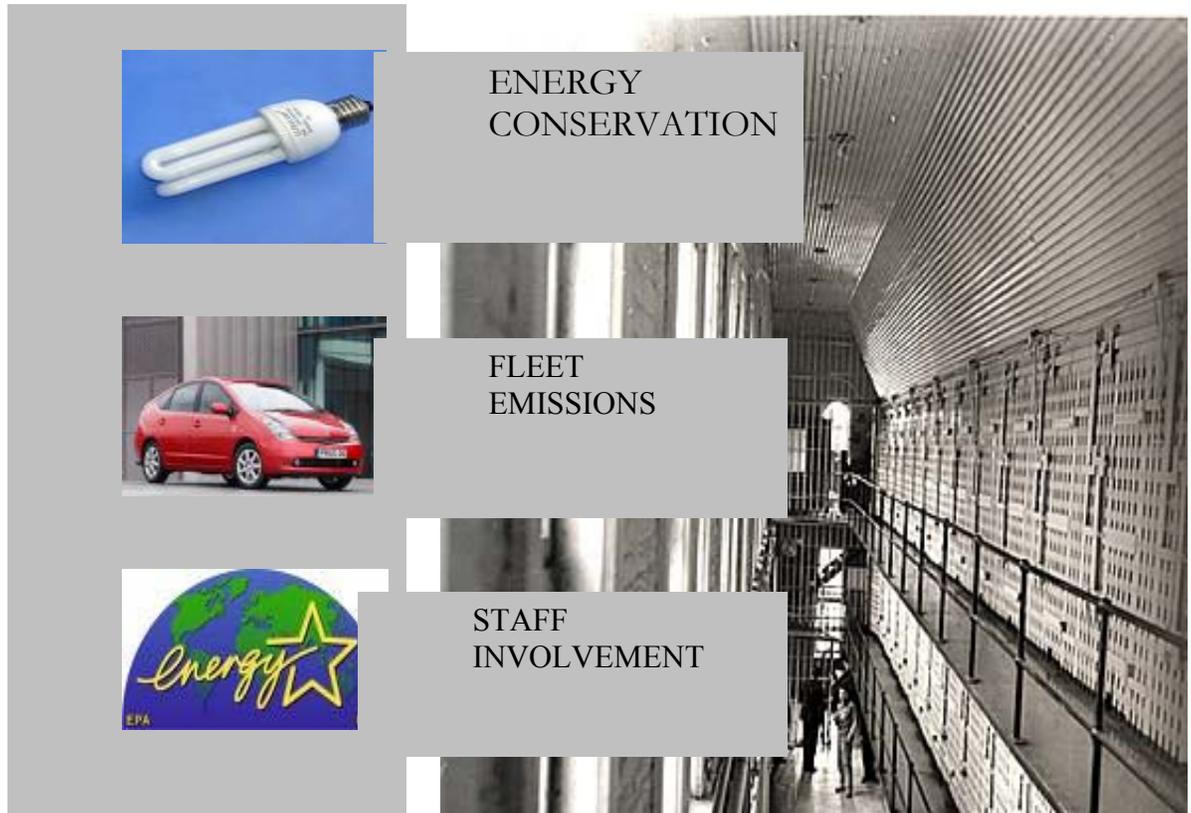
- Encourage employees to shut down computers, monitors, printers, coffee makers, etc. at the end of the workday. This will significantly reduce electricity usage during non-working hours as well as on weekends and holidays.
- Remind staff to turn off lights when they leave their office for extended periods of time.
- Educate employees about the myriad of ways to conserve energy and save money both at home as well as at the office.
- Ask employees to recommend to administration at least one energy savings tip that can be incorporated into our plan.
- Hold brown bag lunches to share information and best practices with employees.
- Inform employees about the benefits of installing energy star appliances in their homes to take advantage of rebate programs and tax credits.

Conclusion

By implementing the measures above, DCC employees will help conserve energy and improve efficiencies both at the office and at home, thereby helping meet the Governor's goal by the year 2015. Because all of our buildings (with the exception of the Chase Home) are managed by DFCM, we will focus our efforts on behavior changes that we can more easily affect. The Energy Resource Team will be key points of contact for each building location, and will report updates and progress on a regular basis through their division directors to administration. This plan will be updated when additional information, training and resources become available, and reviewed regularly to ensure we are meeting our goals.

APPENDIX I-7

Department of Corrections Energy Efficiency Plan



Utah Department of Corrections
2008 Energy Efficiency Plans

Energy

In 2006, and again in 2007, Governor Jon Huntsman Jr. established a goal for state agencies to improve energy efficiency by 20% by 2015. Initially, the energy efficiency goal was aimed at state buildings. However, that goal was expanded in 2007 to include state fleet vehicles. This document outlines both efficiencies already realized by the Department of Corrections, as well as plans to further enhance energy efficiency within the Department. The focus will include facilities, fleet, and initiatives with Department staff to conserve energy both in the workplace and at home.

Summary

The Department of Corrections continues its quest to accomplish the 20% energy savings as stipulated by the Governors Executive Order 2006/0004.

**Department total savings for year FY2007
\$606,232**

Electrical	\$ 136,754
Natural Gas	\$252,011
Water	\$196,300
Solid Waste	\$21,167

**Power Consumption and
Conservation**

UDC has worked extensively at capturing the “low hanging fruit” of energy conservation. Four areas of conservation were targeted: Electrical, Natural Gas, Water Consumption, and Sewer/Solid Waste.

ELECTRICITY

Electrical lighting upgrades are the largest area of accomplishment with approximately 88% of our facilities now using the newer technology of T-8, T-5, Flourex, CFL or HID lighting to provide the lighting in our facilities. We have also installed premium efficiency motors in our HVAC systems as well as other areas where large motors are used to operate the facilities systems.

NATURAL GAS

The conservation of natural gas has also been a large focus of UDC efforts. The revitalization of the Draper site geothermal well has proven to be a great asset lowering the heating demands on the natural gas fired boilers. Draper also implemented a wide-spread controls upgrade for the HVAC systems in most of the buildings. We only have a few buildings left with the older pneumatic technology. The controls allow us to provide scheduled occupancy times with night setback functions allowing us to turn the systems off or to a minimum setting thus reducing the need for heating or air conditioning.

At the Central Utah Correctional Facility in Gunnison, Utah (CUCF) the new boiler and new controls will slightly increase rather than lower our natural gas bill. However, it will significantly lower our operating costs for labor, maintenance and upkeep. The old coal fired boiler that has been operating since the facility was constructed in 1986 is being replaced due to the high maintenance costs, inability to find parts to maintain its operation and the need to have staff on site to tend the boiler 24/7. We have also experienced great difficulties in locating high quality coal from local mines. We are such a small customer that all the quality coal is shipped away and we are left with inferior grades of coal which do not produce the necessary BTU's so we end up burning more coal than necessary or augmenting the steam demands with a natural gas fired boiler. The new natural gas boiler and the controller will allow for a much more efficient control of the boiler with a 10 to 1 turn down on the burner to match the best production of heat

for the load. This type of control of the coal boiler was impossible.

We have implemented stack economizers on the main boilers to pre-heat the makeup water for the boilers thus lowering the load on the boilers to heat the makeup water into steam.

WATER Conservation

Water conservation controls were installed at Draper and Gunnison prison sites to reduce the consumption of water. It has been calculated by Johnson Controls that our water savings will provide water for 1,000 homes. Another measure UDC is utilizing around more of its buildings is zero-scaping around the prisons as well as the administration building while still maintaining trees to provide shade to help reduce the solar heating of the buildings. Secondary irrigation water sources have been utilized for irrigation and conservation of potable water sources. Draper has been the most aggressive with this conversion and now has approximately 70% of all planted areas irrigated with non-potable water. We would like to expand this at Draper and other sites as the infrastructure is provided by city and county development.

SEWER/SOLID WASTE

With the conservation of water comes the by-product of reduced sewage flows. From our water conservation efforts, we have reduced the sewage outflow at Draper prison site by 50%. Another measure that was implemented at Draper was the installation of pulpers in the kitchens at Northpoint and Southpoint. This has reduced the water content of the kitchen waste as well as provided a source of pulp and organic compounds used in the greenhouse programs for the production of flowers used by the State Capital and other state

A brief perspective of the actual benefits provided by the Draper prison ESCO, a self-funded project

- ☞ 43.45 billion BTU's of energy were saved, equivalent to the following measures:
 - enough to heat 312 homes for a year
 - or 2,068 tons of coal
 - or 412,627 gallons of gas
 - or 7,758 barrels of crude oil
- ☞ Saved 87.6 million gallons of water, enough to support 1,000 Salt Lake valley homes annually
- ☞ \$11.5 million in self-funded capitol improvements
- ☞ 4.68 million tons of carbon dioxide were reduced, equivalent to eliminating 313,295 cars annually

buildings thus lowering the amount of solid waste we send to the landfill and lowering the cost of this service. CUCF has also seen a reduction in sewage flow due to the water controls installed in the new buildings. We are working towards an expansion of this technology to the original housing units that were constructed in 1986 prior to this technology being available. It is part of the plan for every new building to be equipped with this technology.

WIND ENERGY

Wind energy was studied at the Draper site for one full year. It was determined that the

project would not be fiscally responsible. The elements that governed this decision were the wind was not constant enough to provide the energy necessary to realize a pay back within 20 years. Current electrical energy costs are too low and the lifespan of the turbine equipment were too short which played a part in the final decision. The only way this project would be feasible is if a grant was available to offset the majority of the cost for the turbine or if the cost for electricity increased by another 200%. This would then allow the project to be feasible.

FUTURE CONSERVATION PLANS

On the horizon is the expansion of occupancy sensors used in offices and other areas where the lighting can be controlled but not jeopardize security. Visiting rooms, rest rooms, offices, file rooms etc are all prime candidates for this technology. UDC is working with DFCM’s Energy office and Rocky Mountain Power to implement this measure.

Additionally, re-commissioning of the older buildings HVAC controls and the conversion to a DDC over pneumatic will provide for a greater efficiency of operation, comfort and allow for scheduled operations where it is possible to have night and weekend setbacks to minimize energy consumption. This is not possible in offender housing areas but several offices and support spaces can be modified to allow this conservation.

Expansion of the Draper site’s geothermal resource will be pursued to carry more BTU’s to outlying buildings and to the currently proposed cook/chill production kitchen. With a resource of 170-degree water available to pre-warm, water used in cooking, preparing foods or to re-thermalize already prepared foods. This will have a large impact on the BTU’s otherwise needed to perform these processes if done by steam, natural gas or by electricity. This resource will be a great asset if developed properly and implemented to transport its thermal energy over long distances effectively.

Offender housing design changes as those implemented in the 192 bed secure unit will be expanded to also include an efficiency model as provided by DFCM’s new energy position. The two main housing footprints that are used by UDC will be evaluated and improved

SAVINGS AS REPORTED			
Electricity TOTAL	\$136,754		
Draper	\$100,101		
Gunnison	\$25,526	(380,653 kWh)	
Adult Probation/Parole	\$11,127	(196,197 kWh)	
Natural Gas: Draper	\$252,011		
Water: Draper	\$196,300		
Sewage/Solid Waste: Draper	\$21,167		

as we learn from new technologies in insulation, ventilation and solar applications. The RFP for the “Third Site Study” included language to investigate alternative energy resources that may be found on or near the future site. Just as the geothermal resource is vital to the efficiencies at the Draper site, so would alternative energy sources be to a new site whether, it be by geothermal, wind, biomass, solar or by some other technology to

offset the high costs of operating a penal organization for the State of Utah.

Expansions in water management systems in current and future offender housing units as well as limiting the areas that require irrigation and regular maintenance for their upkeep for existing and new facilities. Much can be done to reduce our culinary water needs. Capturing and reusing the surplus water generated by system operations, by wells, springs and other naturally occurring sources of water can only benefit the operations of the institution as well as provide a benefit to the citizens of the State.

Corrections Vehicles: Fleet Emissions

The Department of Corrections reviewed the option of converting vehicles to natural gas, along with adding a natural gas site to the draper prison site. During this review, it was found that the only vehicle being manufactured with natural gas was the Honda Civic. It was also discovered that vehicle manufactures have stop making natural gas vehicles and were going more to hybrid vehicles. The cost to convert a vehicle to natural gas also proves to not be feasible. The cost of such a conversion ranges from \$10,000 to \$15,000 per vehicle. The CNG is also located in the trunk of the vehicle making the trunk with limited space; thus not allowing our officers to carry the necessary equipment to complete their duties. Natural fuel sites are very limited and with the Department of Correction's staff located statewide, an obvious concern surfaced as to how staff would obtain the natural fuel if no natural gas site were available.

As the vehicle manufacturers continue to develop and make available hybrid vehicles, many of those vehicles still do not meet the need of law enforcement. Correction's Fleet Management will continue to monitor feasibility of future use of hybrid vehicles. However, the Department of Corrections decided to review their vehicle fleet to determine if there were any vehicles, which are not law enforcement vehicles, which could meet the goals of the Governor to become more energy efficient.

Plan for Vehicle Energy Efficiency

Correction's Fleet Management reviewed the fleet and determined that mid-size vehicles in the daily pool area and one executive deputy director vehicle could be replaced with the hybrid, Toyota Prius. Though the daily pool and deputy director vehicles were not part of the replacement vehicles this year, it was determined that these vehicles could be reallocate to areas within the department that had vehicles on the replacement list. This resulted in allowing five vehicles to be replaced in 2008 with the hybrid - Toyota Prius.

Many staff members are not aware of what a hybrid vehicle is and how it functions. Corrections will begin to educate staff on what a hybrid vehicle is. Also, staff may not be aware of tax credits for purchasing a hybrid vehicle. Staff will be informed that they may want to contact their tax accountant to determine if they qualify for a tax credit when they purchase a hybrid vehicle.

The Department of Corrections is currently implementing a future plan for the external security vehicles used at the prison sites to be police package SUV 4x4 hybrid vehicle.

The Draper site encompasses approximately 800 acres. Part of the property consists of open farm field, sandy riverbanks, open rocky washboard, soft dirt, and paved roads. The Gunnison site encompasses approximately 550 acres. Part of the property consists of open rocky washboard, soft dirt, rolling terrain, undeveloped land next to the prison and paved roads. As such, Corrections will need to continue utilizing SUV four-wheeled vehicles in order to continue to achieve a safe work place, in a variety of weather conditions, for staff, inmates, the community and public.



The external security vehicles are assigned to be used 24 hours a day, 7 days a week. The staff member using the vehicle must have the ability to patrol, respond and be deployed quickly throughout the site, including surrounding areas, under normal or adverse weather. These vehicles must have the necessary clearance and traction to traverse old paved roads, unimproved roads, open dirt terrain, hillsides, riverbanks, rocky washboard areas and wild vegetation.

As these vehicles come up for replacement, Correction's Fleet Management will work with State Fleet Services to see if a SUV four-wheeled hybrid vehicle is on contract and will meet the needs required to obtain a safe environment.

In the future and as more hybrid vehicles continue to be manufacture, Correction's Fleet Management will review the 12-passenger vans utilized at the community correctional centers to determine if a van type hybrid vehicle can replace the current vans being utilized.

Currently, Department of Corrections has 399 vehicles. Over half of these vehicles are considered law enforcement vehicles. Certified peace officers that make arrests, transport offenders, do surveillance and other law enforcement duties drive these vehicles. The vehicles are equipped with lights, sirens, radios and other law enforcement type equipment. The standard hybrid vehicle offered from State Fleet Services this year is the Toyota Prius. This vehicle is considered compact and not considered a law enforcement vehicle; therefore this hybrid vehicle does not provide adequate space necessary for the officer to perform the required duties nor does the hybrid vehicle have enough power to run all the necessary law enforcement equipment. It is the understanding of Correction's Fleet Management that the police package vehicle hybrid that is available is a SUV; which is not feasible at this time to purchase. Corrections Fleet Management will continue to work State Fleet Services to see when a police package hybrid sedan is available.

Employee Initiatives

State employee efficiency is the part of the program where state employees can make the greatest difference in meeting the Governor's goals. The Department will promote

energy/emission savings through changing behavior. It is planned to tackle this through a two-pronged approach. The first is generating interest in the program by having a department-wide kick-off event and the second is positive reinforcement through new sections on the Department's employee website and in the quarterly newsletter The Rap Sheet. The sections will be called "All Things Green".

"SEE" the Light! Program Kick-Off

On Monday, January 14, 2008, the Department will kick-off its Employee Efficiency Program. This program was introduced by an article in The Rap Sheet that was disseminated on December 20, 2007. The article announced the kick-off and detailed the different components of the program.



Prior to the kick-off, handouts will be prepared for each employee. The handouts will be a recyclable bag containing a "SEE" the Light! bookmark, a key chain with a Utah license plate background with "CONSRV" written on it and a compact fluorescent light (CFL) bulb. Dissemination of the handouts will coincide with the initial kick-off.

The kick-off will initially focus on five easy behavior changes an employee can make that will dramatically impact the environment. There will be a number of contests with prizes the first week to generate excitement. The main contest will focus on employees completing a pledge form that states:

"I pledge to do my part to save energy and help reduce the risks of global climate change by replacing at least one light in my home with an Energy Star qualified one."

Completion of this pledge will be fairly easy as employees were previously supplied with a light bulb in their handout. Additional recognition will be given to the division that has the highest percentage of employees who commit to make the other four behavior changes.

Weekly on-going e-mails will continue on various conservation topics to include community partners; i.e. Questar, Rocky Mountain Power, etc. Possible topics for discussion will be: What is a Carbon Footprint and How Do We Reduce It?; Building Energy Efficiency; Fleet Energy Efficiency; Purchase Energy Efficiency; What is Power Forward?; Home Energy Audits; Litterless Lunchday; Recycle Printer Cartridges; Earth Day (April 22); Themes: Energy, Waste and Water; The 3 Rs: Reduce, Reuse and Recycle; Where's the Drip?; Wat-er your needs?; Best Energy Buys in Appliances; How to Get Clear on Water, What is a Green House?; etc.

“All Things Green” Sections in The Rap Sheet and on the Employee Website

As indicated above, the “All Things Green” sections of The Rap Sheet and the employee website will reinforce initial kick-off initiatives. Articles in The Rap Sheet will focus on on-going energy conservation tips for employees. The “All Things Green” section on the employee website will be the repository for all information provided as part of the weekly e-mails to staff members. Included on the site will be the pledge form referenced during the initial kick-off.



Thomas Patterson, Executive Director
14717 Minuteman Drive
Draper, Utah 84020

APPENDIX I-8

UTAH STATE OFFICE OF EDUCATION OFFICE ENERGY CONSERVATION AND EFFICIENCY MEASURES January 2008

The Utah State Office of Education is a State-owned building operated under the management of Division of Facilities and Construction Management (DFCM). Most of the requirements associated with Governor Huntsman's Executive Order will be handled through DFCM and through automatic settings in the office, as ordered and controlled by DFCM.

Therefore, the USOE Strategic Plan to meet Governor Huntsman's Executive Order and Utah Code Section 63-9-67 to Improve Energy Efficiency by 20% by 2015 is comprised of the following items to change human behaviors of employees and to recognize and reward energy efficient behaviors. This will be accomplished through our agency newsletter articles, in-service trainings and other activities initiated by our Employee Action Committee.

Lighting Measures

1. To the extent possible, replace incandescent lights with compact fluorescent lights (CFL) for desk lamps and overhead lighting. CFLs use one-fourth the energy and last up to 10 times longer than comparable incandescent bulbs. Note that manufacturers typically recommend a "burn-in" period to maximize the life of the CFL.
2. Switch off all unnecessary lights.
 - Turn off lights when you leave at night
 - Turn off lights when leaving areas for any period of time
 - Use daylight instead of electric light whenever possible
 - Use task lighting and turn off general lighting where feasible to maintain sufficient lighting levels for safety and productivity
 - Use Energy Star® products
 - Turn off display and decorative lighting
3. Whenever possible, use the stairs instead of the elevator

Personal Computers and Appliance Measures

1. Turn off printers when not in use
2. Turn off monitors when not in use

3. Ensure Energy Star® power down features are activated
4. If computers do not have Energy Star® features available, turn them off when leaving the office for more than 30 minutes
5. Turn off your computer and monitors at the end of the day, if possible.
6. Turn off photocopier at night or purchase copier with low standby feature. Purchase printers and fax machines with power management feature and use it.
7. Avoid using or ensure that personal appliances such as fans, space heaters, radios and coffee pots are turned off.
8. Coordinate with vending machine vendor to install Energy Star® vending machines

Heating and Cooling Measures

1. Keep blinds drawn during a hot summer day; open them during the sunny part of a winter day
2. Allow casual attire to make higher temperatures more acceptable
3. Consider modifying or reducing operating hours when appropriate to avoid peak demand periods and reduce the number of hours the building is operational
4. Make sure vents are not blocked by furniture or other obstructions

Energy Awareness Measures

1. Partner with outside entities to raise energy conservation/efficiency awareness; i.e., DAS “See” the Light Program
2. Encourage employee participation creating, developing and implementing energy saving initiatives; i.e., DEQ “Green” Team
3. Enhance awareness by providing training opportunities on best energy practices
4. Send periodic messages about energy efficiency via e-mail reminders and other communication channels (posters, updates at all-hands-meetings, brown bag discussions, web pages)
5. Information packets for new employees re: energy efficiency initiatives
6. Recognition/Awards for outstanding contributions

Driving Measures

- 1) Provide drivers with training on best driving practices:
 - a. Reduce aggressive driving
 - b. Reduce vehicle idling
 - c. Follow recommended preventive maintenance
 - d. Avoid rush hour traffic if feasible
- 2) Purchase most economically appropriate size and type of vehicle for operational needs and driving conditions
- 3) Revise business practices, when feasible, to reduce intrastate travel
 - a. Permit telecommuting where appropriate
 - b. Use teleconferencing when appropriate
 - c. Promote carpooling or ridesharing
- 4) Promote use of mass transit

APPENDIX I-9

DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ) ENERGY EFFICIENCY PLAN – 2007

Executive Order on Improving Energy Efficiency

On May 30, 2006, Governor Huntsman issued an Executive Order on improving energy efficiency in the state of Utah. This policy established a goal to increase efficiency by 20% by 2015.

To achieve the Governor's objectives through the State Energy Efficiency Program, the Department of Environmental Quality (DEQ) implemented a "Greening DEQ" program during 2007. This program initially targeted Energy Conservation, Recycling and Choose Clean Air enhancements but will expand in 2008 to address water conservation and other "greening" opportunities. A "Green Team" comprised of representatives from each division and the executive director's office was established to proactively engage all employees in the effort. Appendix 1 contains a copy of the Green Team recommendations. Appendix 2 contains a copy of the green policies subsequently adopted by DEQ.

While all of the objectives of DEQ's greening initiative have benefits to energy efficiency, some are more easily quantified than others. The remainder of this plan will outline the energy efficiency enhancements completed as part of this effort that directly support the Governor's objectives in the following categories: building energy efficiency, BlueSky power program, employee energy conservation, electronics efficiency, motor vehicle fleet efficiency, Choose Clean Air, and employee awareness.

Building Efficiency

DEQ is housed in four separate buildings: DEQ buildings 1 & 2 (near the Tax Commission), the Cannon Health Building, and the Air Monitoring Center in West Valley City. DEQ has a long standing positive relationship with DFCM and DOH with respect to promoting energy efficiency in these buildings.

In fact, prior to Governor Huntsman's executive order to increase energy efficiency in the state, DEQ completed several projects within DEQ buildings 1 & 2 to conserve energy. Our efforts were recognized in 2001 when DEQ Building #2 received an EnergyStar award.

Improvements made to within DEQ buildings 1 & 2 prior to the Governor's Executive order include:

- Installation of energy efficient fluorescent lighting fixtures.
- Placement of reflective film on windows.

- Installation of a new HVAC system.
- Installation of light sensors.

During 2007, additional projects completed to enhance energy efficiency within DEQ buildings 1 & 2 included:

- Replacing roof top air handling units with high efficiency system;
- Replacing boiler in building #2 with high efficiency unit.
- Installation of updated building controls for heating, air conditioning, ventilation, and parking lots lights.
- New energy efficiency roof tops.

Because so many energy efficiency enhancements had already been completed in these buildings, DEQ's Green team recommended that an energy audit of all DEQ facilities be completed by Rocky Mountain Power to determine if there were any cost-effective energy conservation projects that remained to be completed. The energy audits completed for each building are in Appendix 3. Discussions on the audits are in progress and no action has been taken during this reporting period.

Blue Sky Power

The Green Team also recommended that DEQ purchase 100% of its electricity through Rocky Mountain Power's Blue Sky program. The team felt strongly that this was an excellent way to meet the Governor's energy goals, support renewable energy, and reduce DEQ's carbon footprint and mercury emissions. It was estimated that DEQ's cost would be approximately \$14,000/year for 100% Blue Sky power (a 14% increase in annual cost). This recommendation was accepted and DEQ is working with DFCM to make the change.

Employee Energy Conservation

An important part of the Blue Sky recommendation included a "cubicle and office energy use" baseline assessment of to determine how "conserving" DEQ employees were currently." This survey was undertaken to determine if significant conservation education efforts needed to be undertaken as it was hoped the added expense of the BlueSky power could be offset by reducing energy use.

Since DEQ is an environmentally oriented agency, the Green Team assumed a high rate of "green literacy." Each green team representative completed an after-hours/"stealth" survey of their entire work area to quantify the following: lights left on, computers left on, and the number of personal heaters, coffee pots, refrigerators, and microwaves. In DEQ Buildings 1 & 2 there was nearly 100% compliance with computer and light shut-off. In the CHB, there was nearly 100% compliance with computer shut-off but a problem with the overhead lights was identified due to timer issues. Green Team representative sin the CHB are addressing this issue. There were approximately 25 "personal" appliances counted but the group felt that was too small a number to address and the potential morale issues could far outweigh any miniscule energy savings.

Electronics Efficiency

DEQ has purchased flat screen monitors to accrue energy savings for three years. We have also had a preference for EnergyStar products. However, recently the policy has been adopted that all DEQ electronics meet the EPEAT Bronze level. As new computers are installed at desktops, DEQ fully utilizes energy saving features. Also, part of DEQ's recycled paper content, all DEQ desktops, printers, and faxes are required to default to double-sided printing which will decrease energy use.

Motor Vehicle Fleet Efficiency

DEQ operates a fleet of 46 vehicles, which are allocated throughout the Executive Director's Office and six divisions as shown in the following table:

DEQ Motor Pool

Area	Mid-sized Sedans	Compacts	Vans	SUVs	Truck	Total
Administration		4		5		9
DDW	1			2		3
DERR	1	1		2	1	5
DRC	1			1		2
DAQ	2	2	3	2	1	10
DSHW	3		2	2		7
DWQ	3		2	5		10
Total	11	7	7	19	2	46

Within the fleet are two CNG vehicles and four hybrids. After thorough analysis, the Green Team recommended that DEQ replace all DEQ motorpool vehicles, under the normal rotation schedule, with hybrid electric vehicles. As the number and types of vehicles and trucks using hybrid technology increases, we anticipate being able to meet DEQ's fleet needs under this policy.

Choose Clean Air

In addition to a cleaner fleet, DEQ is developing an enhanced trip reduction program to reduce vehicle miles driven by employees both to get to work and as part of their work duties. This enhanced program includes telecommuting, flex schedules, carpooling, teleconferencing and other options, as well as encouraging employees to use public transportation.

Under this effort the Executive Director meet with all front line managers to solicit their ideas on how they can assist their employees reduce their vehicle miles driven. To date the following has been implemented:

- Every DEQ employee is offered a free regular UTA ECO-PASS pass or a FrontRunner/Express UTA ECO-PASS for only \$20.00.
- An on-line tracking system has been developed using Survey Monkey to assess vehicle miles reduced by all employees through use of the ECO-PASS, telecommuting, flex schedules, teleconferencing etc.

- Estimated pollution reductions from DEQ's Telework program include:

Reduced Carbon Monoxide: 2,815 lbs

Reduced Nitrogen Oxide: 175 lbs

Reduced Sulfur Dioxide: 9.11 lbs.

Volatile Organic Compounds (VOC's): 197 lbs.

During 2008 we will undertake additional enhancements such as training front line managers on how to supervise telecommuters, a specific strategies for RED air days.

Employee Awareness

To support Governor Huntsman's statewide goal for energy efficiency of 20% by 2015, On Earth Day the Executive Director challenged every DEQ employee to sign "Change A Light, Change the World" pledge and install a CFL in their home. Each employee was offered a package with a free CFL, an energy conservation brochure, and energy stickers to place on switches as reminders to turn off the lights. Using the "Calculate Your Savings" website for all 425 employees, DEQ realized the following savings:

46,750 KWh saved

\$3,633.75 saved

33.2 tons CO2 reduced

4.25 cars removed from road for 1 year

8.5 acres of forest air pollution reduction equivalent

Additionally, each Green team member is actively involved within their division with implementing all the green policies and educating their co-workers and managers on the effort and what they can do to make a difference by implementing the green policies.

Conclusion

DEQ has made a significant effort to meet the Governor's objectives. However, some challenges exist with quantification of our successes. For instance, we do not have the sophistication in energy monitoring to assess the decrease in energy use we expect to occur from the duplexing requirement. Despite the challenges, DEQ is committed to continuous improvement in greening all its operations.

APPENDIX I-10

Utah Department of Health
Energy Efficiency Plan for FY08
January 11, 2008

1. **PURPOSE:** The Utah Department of Health has embraced Governor Huntsman's goal of "increasing energy efficiency by 20% by 2015." The department will effect the maximum change within its ability. This plan is effective upon publication.
2. **SCOPE:** The Utah Department of Health employees work in over forty separate facilities. However, in only one of these facilities does the department have the ability to control and measure energy conservation. The warehouse facility at 130 S. Redwood Road in North Salt Lake is the only leased facility in which the department directly pays utilities. In all other leases the utilities are part of the lease payment and not a separate line item. Additionally, the Department of Facilities Construction and Management manages all state owned-facilities in which the department has employees.
3. **FY 08 PLAN:** The Utah Department of Health Energy Efficiency Plan is divided into two parts. The first part addresses the department warehouse with direct actions. The second part covers all other buildings. Listed below are the specific actions the department has already taken or will take to increase efficiencies during FY08.
 - a. **Warehouse.**
 - i. **Security of the warehouse heating.** In FY 07 a sharp increase was noted in the cost of heating the warehouse. After investigation, it was determined that individuals were coming to the warehouse, increasing the thermometer reading but forgetting to reduce the reading upon their leaving. We have installed a locked box around the thermostat, which allows warehouse staff to adjust the thermostat. Due to the heavy manual labor associated with warehouse work; we have been able to maintain a 52-degree temperature throughout the winter. There is no air conditioning during the summer.
 - ii. **Lighting in the warehouse.** The warehouse is equipped with energy inefficient lights. We will replace them with high bay fluorescent lights that will still maintain OSHA standards for safe lighting in a warehouse environment.
 - iii. **Once these actions have taken place we will request an energy audit be performed on both suites D and J of the warehouse.**
 - b. **All other facilities.**
 - i. **The department does not have the primary role of managing the energy use in the other facilities where our employees work. However, there are good faith steps that the department and its employees will take.**
 1. **In his holiday message to the department, Dr. Sundwall personally invited all employees to sign up for the Energy Star Pledge.**

2. Energy efficiency training for all employees during FY 08.
 3. Replace energy inefficient lights with new efficient lights.
 4. Ensure all new equipment buys are energy star efficiency rated.
 5. Work with DFCM and other building management to fund energy efficiency programs.
 6. Non-mission essential electrical equipment will be turned off on weekends and nights to save energy that would otherwise be consumed.
 7. Build in energy efficiencies during the planning and construction of the new Unified State Laboratory.
 8. Install motion detectors in conference rooms; break rooms, conference rooms and other appropriate rooms to limit unintentional light use.
 9. Adjust blinds to bring in solar heat during cold periods and bar solar heat during hot periods.
 10. The Office of Employee Support will send out monthly energy efficiency reminders, posters and information to the department.
- ii. Recommissioning and energy audits of all buildings. The department will work with and highly encourage DFCM and the owners of leased buildings to perform recommissioning and energy audits of all buildings.
- c. Vehicle energy issues: In addition to the facilities, Department leadership has authorized additional steps to decrease energy usage.
1. The department will promote mass transit by participating in the ECOPASS program with UTA. The passes will be given free of charge to all employees that work at a site serviced by UTA.
 2. DOH motor pool has downsized one midsize car to a compact.
 3. Drivers are now required to view both the State Risk Management drivers training video and a National Safety Council video concerning aggressive driving.
4. Measuring and Evaluation: Baseline data for FY07 will be compared with FY08 to determine the efficacy of the Energy Efficiency Plan. In addition to the raw consumption data, average monthly temperatures will be compared to adjust the comparisons for environmental differences. From this data comparison, the department will develop adjustments and additional steps to insure the department meets Governor Huntsman's goal by 2015.

APPENDIX I-11

DEPARTMENT OF HUMAN RESOURCE MANAGEMENT

OFFICE ENERGY CONSERVATION AND EFFICIENCY MEASURES

December 2007

1.0 Employee Education and Awareness Measures

- 1.1 Statewide
 - 1.1.1 Put energy conservation tips in each edition of the employee newsletters.
 - 1.1.2 Put energy conservation tips on paycheck stubs.
 - 1.1.3 Put energy conservation tips and links on DHRM website.
 - 1.1.4 Educate employees on how much energy the state actually uses or saves through periodic newsletter articles - have someone from DAS write article on this topic for newsletter.
- 1.2 DHRM
 - 1.2.1 Put an energy conservation tip in each edition of the DHRM HR newsletter.
 - 1.2.2 Purchase and post energy savings tip posters in each DHRM field office.
 - 1.2.3 Place decals on equipment to remind DHRM employees to turn off equipment each night and on weekends.
 - 1.2.4 Provide energy conservation “give aways” at DHRM meetings such as summer meeting and Holiday meeting i.e. note pads, pens, etc.
 - 1.2.5 Assign one staff member in each DHRM field office to help educate DHRM employees on energy conservation i.e. puts up posters, distributes light switch plate covers, shares energy conservation tips at staff meetings, etc.

2.0 Lighting Measures

- 2.1 Have DFCM replace current light switches in DHRM conference room and 2112 with motion sensors.
- 2.2 Coordinate with DFCM to replace all incandescent task lighting with compact fluorescent lights.
- 2.3 DHRM staff to turn off office lights when they leave for meetings, lunch, and end of day.
- 2.4 Purchase and distribute light switch plate covers that remind DHRM employees to turn lights off when they leave offices.
- 2.5 Audit DHRM workspaces to identify those that need task lighting. Coordinate installation with DFCM.
- 2.6 Use task lighting versus general lighting when possible.
- 2.7 Encourage use of daylight versus electric light when possible.

3.0 Computers, Office Equipment, and Appliances Measures

- 3.1 Last employee in each DHRM office turns off main printers, copiers, faxes, etc each night. If copiers have standby feature, use this.
- 3.2 Employees turn off their computers at end of each day.
- 3.3 Employees enable power manager on their computers.
- 3.4 Place decals on equipment to remind DHRM employees to turn off equipment each night and on weekends.
- 3.5 Employees to turn off radios at end of each day.
- 3.6 Employees turn off coffee pot at end of each day.
- 3.7 Place decals on equipment to remind DHRM employees to turn off equipment each night and on weekends.

4.0 Heating and Cooling Measures

- 4.1 Close blinds during hottest part of summer days.
- 4.2 Open blinds on sunny winter days.

5.0 Driving Measures

- 5.1 Continue to promote use of mass transit through ECO Pass program.
- 5.2 Encourage employees in car pool.

APPENDIX I-12

DEPARTMENT OF HUMAN SERVICES OFFICE ENERGY CONSERVATION, EFFICIENCY MEASURES, AND STRATEGIES

Lighting Measures

1. Use state resources to assist in identifying energy conservation and efficiency projects.
 - DHS will continue working with John Harrington who is heading up the state's energy program and compile numbers of the following:
 - Number of buildings qualifying for project funding
 - Number of buildings currently being converted to efficient lighting
 - Number of buildings completed
 - We will continue to identify and replace incandescent lights with compact fluorescent lights (CFL) for desk lamps and overhead lighting as funding permits.
 - We will not permit the use of any personal lighting with incandescent or halogen lamps in buildings.
 - Identify % of incandescent lights in each building
 - Budget for replacement of lamps or fixtures to accommodate CFS's
 - Projects that exceed \$10,000 will be submitted and prioritized for Capital Improvement Funding
2. Use lighting control systems.
 - Identify buildings that would show improved energy conservation and efficiency if a lighting control system were used and compile numbers of the following:
 - Number of buildings that would show a significant savings if converted
 - Number of buildings currently being converted
 - Number of buildings completed
 - Prioritize these projects with the department improvement projects for consideration by DFCM and compile numbers on the following:
 - Number of projects identified as energy conservation
 - Number energy projects funded
 - Number of energy projects completed
 - We will work with the building energy official to remind staff to maintain sufficient lighting levels for safety and productivity.

Personal Computers and Appliance Measures

1. The building energy official will monitor and remind employees to do the following:
 - Turn off printers when not in use
 - Turn off monitors when not in use
 - Have DTS ensure Energy Star® power down features are activated
 - If computers do not have Energy Star® features available, turn them off when leaving the office for more than 30 minutes

- ❑ Turn off your computer and monitors at the end of the day, if possible
- ❑ Turn off photocopier at night or purchase copier with low standby feature
- ❑ Purchase printers and fax machines with power management feature and use it
- ❑ Encourage staff to turn off personal appliances such as fans, space heaters, radios and coffee pots when not in use.
- ❑ Coordinate with vending machine vendor to install Energy Star® vending machines

Heating and Cooling Measures

1. Identify buildings that would show improved energy conservation and efficiency if an HVAC control system were used.
2. Install programmable thermostats in small buildings that have less complex HVAC equipment.
3. Prioritize these projects with the department improvement projects for consideration by DFCM.
4. In addition to the energy control system, keep blinds drawn during a hot summer day; open them during the sunny part of a winter day.
5. Make sure vents are not blocked by furniture or other obstructions.
6. Make sure that thermostats are free from obstructions and from items that generate heat

Energy Awareness Measures

1. Partner with outside entities to raise energy conservation/efficiency awareness. E.g., DAS “See” the light Program.
2. Encourage employee participation creating, developing and implementing energy saving initiatives. E.g., DEQ “Green” Team.
 - ❑ <http://www.greenchoices.utah.gov>
 - ❑ Encourage recycling by providing containers in employee break rooms and work rooms
 - ❑ Identify and contact recycling vendors to arrange for pick up
3. Enhance awareness by providing training opportunities on best energy practices.
 - ❑ Region Managers and Risk Manager will arrange to meet with agency/division teams during staff meetings to train employees on best energy conservation and efficiency practices on an annual basis
4. Send periodic messages about energy efficiency via e-mail reminders and other communication channels. (Posters, updates at all-hands-meetings, brown bag discussions, web pages.)
 - ❑ Encourage employees to sign up for generated emailing regarding energy conservation practices and updates from state energy offices
 - ❑ http://www.eere.energy.gov/state/energy_program/update/subscribe.cfm
 - ❑ <http://geology.utah.gov/sep/php/mailform.php>
5. Organize desk audit program.
 - ❑ Use building energy official to identify areas of improvement at their location
 - ❑ Region Managers and Risk Manager will coordinate with the energy official to resolve any problems
6. Prepare information packets for new employees re: energy efficiency initiatives.

- ❑ Work in cooperation with Department of Human Resources to hand out information at NEO
- ❑ Region Managers/Risk Manager will deliver material to offices during regular visits

Facility Management Measures (If agency manages facilities)

1. Reduce light levels where ever possible.
 - ❑ When reducing florescent lighting, disconnect light fixtures from power source rather than de-lamp as the later maintains power to the ballast
2. Add occupancy sensor switches where appropriate to minimize the period that lights are on unnecessarily.
 - ❑ Identify locations
 - ❑ Budget for replacement
 - ❑ Track % of switches replaced by building
3. Work to achieve building temperatures within approved ranges, typically 75-76° F during summer months and 68-70° during winter months.
 - ❑ Use programmable thermostats where possible
 - ❑ Use energy management systems where possible
 - ❑ Use tamper-proof thermostat covers where possible
 - ❑ Inform occupants of temperature range required by contracts and energy office recommendations
4. Examine janitorial contracts for hours of service and amend if possible.
5. Minimize hours and illumination levels of exterior lighting.
 - ❑ Use photo cells and astronomic time clocks where possible
 - ❑ Use energy management system where possible
6. Participate in DFCM-approved building managers' operation certificate program.
 - ❑ When DFCM has finalized their approved certificate program, review training completed by maintenance personnel and compare with industry standards
 - ❑ Encourage management to support maintenance personnel participation in training opportunities to bring skill levels up to industry standards
7. Review manufacture's recommendations for HVAC equipment and keep up to date with Facility Focus maintenance programs.
 - ❑ Tune-up air handling units by:
 - Cleaning and adjusting belts
 - Cleaning diffusers and making sure they are open
 - Optimizing fan speed
 - ❑ Tune-up chilled water systems by:
 - Making sure temperature settings are appropriate
 - Verifying on/off schedule for circulating pumps
 - Verifying redundant systems are operating correctly
 - Controlling of cooling load instead of outside air
 - Reduce hot water temperature settings where possible

Vehicle and Driving Measures

1. Provide Drivers with training on best driving practices.
 - ❑ Reduce aggressive driving
 - ❑ Reduce vehicle idling

- Follow recommended preventive maintenance
- Avoid rush hour traffic if feasible
- 2. Work with Fleet Management to obtain the most economically appropriate size and type of vehicle for operational needs and driving conditions.
- 3. Keep current with manufacture recommendations on service and operation of vehicles.
 - Maintain proper tire pressure
 - Replace worn tires
 - Use octane fuel per manufacture recommendations
 - Service vehicle per ARI mileage recommendations
- 4. Promote use of mass transit and carpooling by continuing to participate in the cost of public transportation passes.

SUMMARY

The Bureau of Administrative Support will evaluate each building in the department on an annual basis to determine what energy conservation and efficiency measures are in place and encourage compliance with the outlined strategies.

We will identify one person or position at each location that will act as an energy official to work with BAS Region Managers and the Department Risk Manager to follow guidelines outlined in this document.

We will work in cooperation with DFCM's leasing manager to encourage landlords to adopt a similar energy conservation and efficiency program for leased buildings. We will strongly encourage adding these measures and strategies to RFP's to ensure future leased buildings will be energy efficient.

APPENDIX I-13

UTAH INSURANCE DEPARTMENT Office Energy Conservation And Efficiency Measures

Lighting Measures

1. Comply with DFCM and capitol architect lighting and energy conservation recommendations.
2. Switch off all unnecessary lights.
 - a. Turn off lights when you leave at night
 - b. Turn off lights when leaving areas for any period of time
 - c. Use daylight instead of electric light whenever possible
 - d. Use task lighting and turn off general lighting where feasible to maintain sufficient lighting levels for safety and productivity
 - e. Use Energy Star® products
 - f. Turn off display and decorative lighting
3. Whenever possible, use the stairs instead of the elevator.

Personal Computers and Appliance Measures

1. Turn off printers when not in use.
2. Turn off monitors when not in use.
3. Ensure Energy Star® power-down features are activated.
4. If computers do not have Energy Star® features available, turn them off when leaving the office for more than 30 minutes.
5. Turn off your computer and monitors at the end of the day, if possible.
6. Turn off photocopier at night or purchase copier with low standby feature. Purchase printers and fax machines with power management feature and use it.
7. Avoid using or ensure that personal appliances such as fans, space heaters, radios and coffee pots are turned off.

Heating and Cooling Measures

1. Keep blinds drawn during a hot summer day; open them during the sunny part of a winter day.
2. Allow casual attire to make higher temperatures more acceptable.
3. Make sure vents are not blocked by furniture or other obstructions.

Energy Awareness Measures

1. Partner with outside entities to raise energy conservation/efficiency awareness. E.g., DAS “See” the light Program.
2. Encourage employee participation creating, developing and implementing energy saving initiatives. E.g., DEQ “Green” Team.
3. Enhance awareness by providing training opportunities on best energy practices.
4. Send periodic messages about energy efficiency via e-mail reminders and other communications channels (posters, updates at meetings, brown bag discussions, web pages).
5. Information packets for new employees re: energy efficiency initiatives.

Driving Measures

1. Encourage drivers to practice best driving practices:
 - a. Reduce aggressive driving
 - b. Reduce vehicle idling
 - c. Follow recommended preventive maintenance
 - d. Avoid rush hour traffic if feasible
2. Revise business practices, when feasible, to reduce intrastate travel
 - d. Permit telecommuting where appropriate
 - e. Use teleconferencing when appropriate
 - f. Promote carpooling or ridesharing
3. Provide UTA Eco-Pass, at a reduced price, to department employees to promote use of mass transit.

APPENDIX I-14

UTAH LABOR COMMISSION ENERGY CONSERVATION AND EFFICIENCY MEASURES

Lighting Measures

1. Replace incandescent lights with compact fluorescent lights (CFL) for desk lamps and overhead lighting. CFLs use one-fourth the energy and last up to 10 times longer than comparable incandescent bulbs. Note that manufacturers typically recommend a “burn-in” period to maximize the life of the CFL.
2. Switch off all unnecessary lights.
 - Turn off lights when you leave at night
 - Turn off lights when leaving areas for any period of time
 - Use daylight instead of electric light whenever possible
 - Use task lighting and turn off general lighting where feasible to maintain sufficient lighting levels for safety and productivity
 - Use Energy Star® products
 - Turn off display and decorative lighting
3. Whenever possible, use the stairs instead of the elevator

Personal Computers and Appliance Measures

1. Turn off printers when not in use
2. Turn off monitors when not in use
3. Ensure Energy Star® power down features are activated
4. If computers do not have Energy Star® features available, turn them off when leaving the office for more than 30 minutes
5. Turn off your computer and monitors at the end of the day, if possible.
6. Turn off photocopier at night or purchase copier with low standby feature. Purchase printers and fax machines with power management feature and use it.
7. Avoid using or ensure that personal appliances such as fans, space heaters, radios and coffee pots are turned off.
8. Coordinate with vending machine vendor to install Energy Star® vending machines

Heating and Cooling Measures

1. Keep blinds drawn during a hot summer day; open them during the sunny part of a winter day
2. Allow casual attire to make higher temperatures more acceptable
3. Consider modifying or reducing operating hours when appropriate to avoid peak demand periods and reduce the number of hours the building is operational
4. Make sure vents are not blocked by furniture or other obstructions

Energy Awareness Measures

1. Partner with outside entities to raise energy conservation/efficiency awareness. E.g., DAS “See” the light Program
2. Encourage employee participation creating, developing and implementing energy saving initiatives. E.g., DEQ “Green” Team
3. Enhance awareness by providing training opportunities on best energy practices
4. Send periodic messages about energy efficiency via e-mail reminders and other communication channels (posters, updates at all-hands-meetings, brown bag discussions, web pages)
5. Organize desk audit program (?)
6. Information packets for new employees re: energy efficiency initiatives
7. Recognition/Awards for outstanding contributions

Facility Management Measures: Although the Labor Commission does not manage its own facilities, we will work with DFCM to:

1. Reduce light levels where possible
2. Add light switches and occupancy sensor switches where appropriate to minimize the period that lights are on unnecessarily
3. Keep thermostat at 75-76° F during summer months
4. Modify hours of janitorial work to minimize cleaning time outside of normal operating hours

Driving Measures

- 1) Provide Drivers with training on best driving practices:
 - a. Reduce aggressive driving
 - b. Reduce vehicle idling
 - c. Follow recommended preventive maintenance
 - d. Avoid rush hour traffic if feasible
- 2) Purchase most economically appropriate size and type of vehicle for operational needs and driving conditions
- 3) Revise business practices, when feasible, to reduce intrastate travel
 - a. Permit telecommuting where appropriate
 - b. Use teleconferencing when appropriate
 - c. Promote carpooling or ridesharing
- 4) Promote use of mass transit

APPENDIX I-15

Narrative Energy Report for FY2007 Utah Army National Guard

- I. **Management and Administration.** The following section will describe (1) the UTNG energy management infrastructure, (2) the plans to use management tools in implementing Executive Order 13423 and (3) our compliance with EPACT requirements, as indicated below.

A. Energy Management Infrastructure

1. Senior Agency Energy Official.

Ricy Jones, CEM, CPM
CFMO Engineering
UTNG Energy Manager

2. Energy Advisory Team.

Ricy Jones – CFMO Energy Team Leader
Darin Pilgeram – CFMO ReCommissioning Specialist
Robert Price -ERM Environmental Specialist

Ricy Jones is responsible for analyzing, justifying and approving all project requests being submitted to NGB. **Darin Pilgeram** has a three-tiered participative role relating to the advisory team. 1st is to ensure full building commissioning occur in all new construction and MILCON projects, 2nd is to track, trend and report on building automation systems, that are currently installed in existing buildings and 3rd is to collect Installation Status Report (IRS) information (energy related projects will be identified using IRS data). **Robert Price** is a key member and expert relating to environmental issues. His main role is to ensure that all energy related projects and measures are in compliance with Federal, State and local guidelines.

B. Management Tools

1. Awards (Employee Incentive Programs).

Awards are given on a facility by facility basis based on participation in the Utah Adjutant Generals Energy Program. Upon each NG member completing our energy awareness program and a successful facility spot-audit the entire facility will receive a letter of commendation and a monetary reward in the form of a group requested upgrade, i.e. weight equipment for P.T. facility.

2. Performance Evaluations.

Energy Manager Performance evaluation is not directly defined on provisions from EO13423 however his performance is based on results directly relating to implemented energy conservation measures, comfort/customer based measures and associate training actions.

3. Training and Education.

Maintenance/Engineering employees are given training opportunities relating to their area of responsibility as deemed necessary by their supervisor. Local training is recommended however some travel is required. Estimated cost of training is \$5,500.00/Year.

4. Showcase Facilities.

TASS phase #1 is our first showcase facility to include full scale commissioning, with LEED Silver as the standard, to include the State of Utah energy standards which is 30% above ASHRAE 90.1. This facility is currently under construction with a tentative completion date of 30 October, 2008.

II. Energy Efficiency Performance.

A. Energy Management Infrastructure

1. Goal Subject Buildings

Utah Army National Guard has had minimal professional energy management oversight in the past. The building square footage and energy consumption data has been inconsistently reported and the data has not been accurate. We have hired a professional energy manager and we are confident our baseline year data is accurately reported in AEWRS as of this date. We have implemented over a dozen energy improvement projects including wind generation, building mechanical and controls ReCommissioning and motor, VFD, and lighting upgrades. The above mentioned project costs are over \$750,000.00 and are funded with federal, state, and utility incentive dollars.

2. Non-Fleet Vehicle and Equipment Fuel Use

Utah Army National Guard does not track this type of energy from the CFMO office and there is not data available through our office.

B. Renewable Energy

1. Self-Generated Renewable Energy.

We have a Micon 225 - Rated power: 225 kilowatt wind generation unit and a Vestas V-47 Rated power: 660 kilowatt wind generation unit which are both located at C W Williams Training Site in Riverton, Utah. These two wind generators with a combined capacity of just under one megawatt of power are able to handle 22% of the power required for this training site.

2. Photovoltaic power

There is currently no photovoltaic power in use in the Utah Army National Guard with the exception of Aviation lighting and remote exterior parking lighting.

3. Purchased Renewable Energy.

None. Utah Army National Guard does not pay premium prices to any utilities or brokers for renewable energy.

C. Water Conservation

The State of Utah, Division of Facilities Construction and Management (DFCM) has a very extensive water conservation policy and program in place. The Utah Army National Guard is in the process of adopting this policy as it is written. Also, DFCM has water and landscape design standards in place for new construction which the UTNG includes in all construction projects. This standard incorporates native plants and grasses that are drought tolerant and we have incorporated pressurized irrigation at the CW Williams Training Site to eliminate the use of culinary water for irrigation.

D. Metering of Electricity Use.

NGB stated at the last CFMOU to hold off on purchasing centralized electric metering equipment until a standard was explored and the economics were evaluated. The UTNG desires to install pulse meters at each of our facilities and monitor from one centralized location our energy use. This will enable us to utilize our building automation systems to incorporate load shedding during peak-use time periods.

E. Federal Building Energy Efficiency Standards.

All new facilities are built following LEED construction standards, attempting to meet qualifications for the LEED Silver building designation. MILCON projects are managed through our CFMO Engineering Office. Construction project managers are well aware of the requirements to build to LEED Silver standard.

III. Implementation Strategies

A. Life-Cycle Cost Analysis.

LCCA is required by our State for all construction projects.

B. Retrofit and capitol Improvement Projects.

All retrofit and new facilities are built to Federal, State and Local Standards including LEED Silver and Energy codes which exceed 90.1 Standards.

C. Use of Performance Contracts

None. We have followed the directive of the NGB to be very careful in entering into these types of agreements.

D. Use of Energy Star® and Other Energy-Efficient Products.

We follow LEED Construction Standards, which require purchasing of Energy Star rated equipment. Our Agency and the State of Utah require any new equipment to be Energy Star Products.

E. Sustainable Building Design and High Performance Buildings.

All new facilities are designed with sustainability in mind and we are

designing to LEED Silver standards.

F. Energy Efficiency in Lease Provisions.

Energy efficiency for leased property is not covered under my scope of duties.

G. Distributed Generation Including Combined Cooling, Heating and Power Systems.

NA. We currently have no co-generation at any of our facilities.

H. Industrial Facility Efficiency Improvements.

NA. We are not involved with industrial facilities.

APPENDIX I-16

Utah Department of Natural Resources 2008 Strategic Plan for Energy Savings January 4, 2008

1. DNR leadership will provide active leadership toward implementing creative energy strategies for the Department.
 - a. Be fully invested in the concept of developing innovative ways to conserve energy.
 - b. Reflect enthusiasm for the subject at division levels.
 - c. Provide best and brightest employees to participate in planning and implementation of this strategy.
2. Undertake efforts to reduce energy use in DNR buildings.
 - a. Identify energy efficiencies in all DNR buildings through staff reporting and visits by the State Energy Program's energy efficiency specialist
 - b. Alert DAS for problems in DFCM-controlled buildings; seek DFCM repairs & upgrades.
 - c. Undertake cost-effective solutions to problems in DNR controlled buildings
3. Establish a department energy task force to study and recommend implementation measures and policy changes; meets quarterly and reports to DNR leadership. Also establish "energy champions" in divisions and/or sub-divisions to assist with implementation and education.
4. Establish DNR policy to limit on-the-job energy usage.
 - a. Require equipment shutdown when appropriate (e.g. computers after hours, monitors if out of office, etc.)
 - b. Enable power saving feature on all computers
5. Make efforts to reduce fuel usage by DNR vehicles and reduce usage by DNR employees in commuting to work
 - a. Offer low- or no-cost UTA Eco-Passes.
 - b. Increase purchases of small sedans and smaller SUV's & pickups
 - c. Encourage carpooling to meetings (both within DNR and with other agencies)
 - d. Permit take-home of DNR vehicles pre-or post-trip if significant miles savings
 - e. Explore options for reducing commuter fuel use (NTO office), such as incentives for carpools, bike, or bus
 - f. Explore DNR subsidizing vanpools or dedicated shuttles; possible partnership with nearby state agencies (DEQ, Ag, Health, Tax Commission)
 - g. Develop new telecommute or flextime policies to reduce number of commuting days
6. Provide energy education training and education to current and incoming DNR employees; topics to include:
 - a. Why we should reduce energy use
 - b. Basic principles of energy use at home or office
 - c. Measures to undertake at office
 - d. reducing vehicle miles driven (commuting and work)

APPENDIX I-17

OFFICE ENERGY CONSERVATION AND EFFICIENCY MEASURES FOR THE UTAH DEPARTMENT OF PUBLIC SAFETY

Overall Department Training

Our number one goal is to train our people in how to be more energy efficient around the office place and to give them reminders. Holding training meetings with qualified trainers, sending out email reminders, having an office/building efficiency coordinator are all things we can do to promote energy efficiency within our offices.

Incentives

Let's get DFCM and building owners to step up to the plate. If we do efficiency measures and we save them everyday maintenance/utility costs, then we should/could have some sort of reward or incentive program in place. In most cases, unless the department is paying the utility bills, savings will either go to DFCM or the building owner. If these parties are willing to work with the department to funnel some of those utility savings back into building improvements, we will most likely be able to set an office goal with a reward at the end ensuring better compliance. In the least, DFCM should be willing to participate.

Lighting Measures

As an employee workforce, we can do small almost unconscious acts everyday that hopefully will become habits resulting in energy savings. We can also get our facilities managers to use more efficient bulbs, etc. Here are a few ideas:

1. Replace incandescent lights with compact fluorescent lights (CFL) for desk lamps and overhead lighting where possible. When incandescent lights are unavailable, lower the wattage of the bulb if it will still provide adequate lighting
2. Switch off all unnecessary lights when leaving at night or when leaving an area for any length of time
3. Use daylight instead of electric light whenever possible and clean windows periodically to make natural light as bright as possible
4. Assign someone to turn off conference room lights at night
5. Change lighting on/off light switches so that lights can be controlled by individual offices instead of by sections of the building
6. Install sensor on/off switches for conference rooms

Personal Computers and Appliance Measures

Here is another area where an employee workforce can change their habits resulting in energy savings.

1. Turn off printers, monitors and computers at personal areas when not in use
2. Turn off other personal appliances such as fans, space heaters, radios and coffee pots when leaving
3. Purchase when available energy efficient office computers and equipment

Heating and Cooling Measures

We believe that our employees need to be comfortable to be the most productive. The last thing we want is for employees to feel uncomfortable because they will most likely get up many times to go to other places, get frustrated with being either too hot or too cold, leave early, etc. It is essential that we have a temperature in a workplace that is moderate enough for all to deem bearable. Here are some things we can do to increase our energy savings

1. Keep blinds drawn during a hot summer day; open them during the sunny part of a winter day
2. Allow casual attire to make higher temperatures more acceptable
3. Consider having temperature zones in offices where certain areas are cooler for those that like working in cooler temperatures and warmer for those that like working in warmer temperatures
4. Make sure vents are not blocked by furniture or other obstruction
5. Consider having each office with its own temperature control that actually works instead of being grouped in three or four offices
6. install E-rated windows that do not allow much transfer of heat or cold

Facility Management Measures (If agency manages facilities)

1. Add light switches and occupancy sensor switches where appropriate to minimize the period that lights are on unnecessarily
2. Participate in DFCM-approved building managers' operation certificate program

3. Tune up air handling units by:
 - Cleaning and adjusting belts
 - Cleaning diffusers and making sure they are open
 - Optimize fan speed
4. Tune up chilled water systems by;
 - Making sure temperature settings are appropriate
 - Verifying on/off schedule for circulating pumps
 - Verifying redundant systems are operating correctly
 - Controlling off of cooling load instead of outside air
5. Reduce hot water temperature settings where possible

Driving Measures

1. Purchase most economically appropriate size and type of vehicle for operational needs and driving conditions
2. Revise business practices, when feasible, to reduce intrastate travel
 - Permit telecommuting where appropriate
 - Allow ten hour four day workweeks
 - Use teleconferencing when appropriate
 - Promote carpooling or ridesharing
3. Promote use of mass transit, if feasible

APPENDIX I-18

Utah State Tax Commission OFFICE ENERGY CONSERVATION PLANNING AND STRATEGIES

PLANNING

- 1) In the past year we have had several meetings with all employees about energy conservation measures. We are encouraging them to be continuously mindful of the need to conserve and use energy wisely, not only in the workplace but also their own homes. Our Director spearheaded a campaign in which, every employee was given an energy efficient light bulb and a bookmark. To remind them of the importance of intelligent energy use. We plan on continuing this project. Through constant reminders and applied teaching methods we will enable our employees to save energy. Office energy consumption will remain our first priority. We have scheduled meetings with key personnel to assist them in training their people in different ways in which office systems can be utilized to work more efficiently. We have several guest speakers coming this year to teach us different ways in which energy is lost through carelessness and thoughtlessness. We will implement these new programs as we are able and we will continue to encourage our employee base to conserve and use wisely.
- 2) For our main building DFCM has suggested several measures which we plan on implementing as soon as feasible. We will have the Janitorial staff work the same hours as the regular employees, so that we can shut off the vast majority of the building lighting system at night. This will include all public areas and the majority of private offices. We will also begin to shut off all automatic lighting in rooms that have minimal use. Energy efficient bulbs will be used to replace old bulbs, as they are needed. Vending machine lights will be turned down or off. We hope to have all of the above implemented and in place by the middle of the annual year.
- 3) As a possible water conservation method we will be looking at the possibility of switching out the urinals in the men's restrooms with waterless devices. We hope to have all of the above implemented and in place by the middle of the annual year.
- 4) For the outlying buildings (DMV) we will be working with our various landlords to implement many of the same measures. Janitorial staff will be encouraged to work during normal business hours whenever possible to enable us to power down at night. Energy efficient bulbs will be used to replace older models. In some cases we will be retrofitting lights and removing obsolete incandescent bulbs. Vending machine owners will be contacted and encouraged to turn down the lights or to remove them entirely.

We will be going over leases to find out what other changes we can request that will make our buildings and people more energy efficient.

Strategy

1) Our overall strategy is education. Our greatest means of correcting this particular problem will be our employees. We will continue to train and provide incentives for energy conservation. We will hold roundtable meetings with various employee groups from different departments and garner suggestions from them on methods that they can practice in their individual areas to conserve energy. After these meeting we will also provide various incentives to the groups that are able to complete this task. DFCM will remain a huge asset, their knowledgeable staff has helped and will continue to help us with ways in which we can make our buildings more energy efficient.

APPENDIX I-19

State of Utah
Department of Technology Services

Energy Efficiency Initiative **2007 / 2008** **Energy Efficiency Initiative**

Prepare DTS EEI Plan for 2007/2008

Plan Items

Review DTS vehicle size and usage (Dec 2007)
Employee Survey (sent Dec 7, 2007)
Energy Savings Training (March 2008)
Reduction/elimination of personal appliances (January 2008)
Energy Star IT purchasing requirements (February 2008)
Employee transportation (UTA Eco Passes January 2008)
IP Video Conferencing (new RFP March 2008)

Plan Items

1.0 Review DTS vehicle size and usage

December 2007

Log Books in all DTS vehicles
Centralize agency vehicles under DTS management
Downsize where possible

Plan Items

2.0 Employee Survey

Completed December 2007

Energy usage
Transportation usage
Equipment usage

Plan Items

3.0 Energy Savings Training

March 2008

Develop training
Purchasing process for Energy Star and EPEAT Standards

Plan Items

4.0 Reduction/elimination of personal appliances

January 2008
Risk Management / OSHA type walk through audit

Plan Items
5.0 Energy Star IT purchasing requirements

February 2008
Energy Star Specification
WSCA Contract usage
Standard PC's and Laptops
EPEAT silver Level Specifications

Plan Items
6.0 Employee transportation
January 2008
Provide Eco Pass to Employees for \$ 10.00 a year
Provide Eco Premium Pass (includes Express busses and Frontrunner) for \$ 19.00 a year
Encourage car pooling

Plan Items
7.0 IP Video Conferencing

March 2008
New RFP for Video conferencing vendors
Increase meeting capabilities
Reduce travel time and expenses

Discussion
Questions and Answers

APPENDIX I-20

ENERGY EFFICIENT FEATURES - UDOT MAINTENANCE FACILITIES

Energy efficiency features currently in UDOT Maintenance Buildings

1. Continuous roof and wall insulation utilizing thermal breaks to achieve energy efficiency greater than 10 percent below ComCheck code requirements.
2. Radiant heating for the maintenance bays in lieu of conditioned air.
3. Evaporative coolers as needed in high temperature climates.
4. Highest energy efficiency insulated garage doors available R 14.5+/-.
5. Motion sensor light switches in office areas.
6. Photocell and timer lighting for the exterior.
7. Strategically placed windows in the doors and sidewalls of the maintenance bay to reduce dependence on overhead lighting.
8. High SEER high energy efficient forced air unit for the offices.
9. High efficiency water heater.
10. T8 lights. In the new concrete block buildings

11. Continuous rigid insulation behind the concrete block.

Other potential strategies for future buildings

Closed loop Ground source heat pump for office heating and cooling (higher SEER for cooling and greater energy savings for heating over traditional systems).

Closed loop Ground source heat pump in the vehicle bays or solar hot water radiant under slab heating coupled with the radiant tube heaters as a second stage of heating.

Cistern for rainwater collection.

Instantaneous water heater.

Two stage flush on toilets.

Flushless urinals.

ALTERNATIVE ENERGY FEATURES - UDOT MAINTENANCE FACILITIES

Murray Maintenance Facility: Completed

System Type:	Solar PV
System Output:	3600 Watt
Installed Cost:	\$26,303.41 (\$7.31/watt)
Grants:	\$10,000 from UGS
UDOT Cost:	\$16,303.41 (\$4.53/watt)
Estimated Utility Offset:	15 percent of shed annual use

This system was installed on October 4-5, 2007. Final net metering approval from Murray City was given on October 8, 2007. The system consists of (20) 180-watt

Evergreen Solar panels, Fronius IG-4500 LV inverter, and Ballast mount rack system. Future upgrades include network card and data logger to allow for production numbers to be monitored from the UDOT Central Office. There is room for one more row of ten panels to put production at 5400 Watts.

Milford Maintenance Facility: Materials on site and in progress

System Type:	Wind Turbine
System Output:	1800 Watt
Installed Cost:	\$14,000 (estimated)
Grants:	\$7,000 from UGS (estimated)
UDOT Cost:	\$7,000 (estimated)
Estimated Utility Offset:	15-20 percent of shed annual use
Estimated Completion Date:	January 2008

This system is designed around Southwest Wind Power's Skystream 3.7. It is a grid-tie-ready wind turbine with the inverter built into the turbine. It is being placed on a 45-foot monopole, 75 feet to the northwest of the building. The maintenance personnel are providing the foundation labor to help save cost due to the remoteness of the location.

Future Efforts

MOAB AREA PROJECTS: UDOT is proposing a project for the Moab Resident Engineers' office and/or maintenance facility. They are both located in good solar availability locations and could produce significant production. We are also considering putting this location on solar trackers to increase energy output. These project(s) will be contingent on funding.

Additional Comments

Solar thermal (in the form of radiant heat floors and domestic hot water) should be incorporated into all new maintenance facilities. At a minimum, foundations should be prepared to accept this technology, as the concrete is the most difficult to upgrade at a later date.

Renewable Energy Credits

Some guidance or help on understanding how the state can leverage the renewable energy credits would be helpful. This seems to have long-term revenue possibilities.

Structuring of Net Metering Programs

There are two basic forms of net metering in Utah--monthly zeroing and yearly zeroing. Metering programs like Rocky Mountain Power zero the customers account credit each month, not allowing for credit carry over. Other programs, such as Murray City or St. George City, allow for a yearly net metering program that provides much more incentive due to the ability to "bank" power generated in the summer months and use it in the winter months.

Public Perception of Initiative and Power Purchase Agreements

The public has had positive to negative views on the state's involvement on Renewable Energy. The out-of-pocket costs are difficult to justify to the public in light of little or no tax incentive. Although the tax incentives are ultimately taxpayer's money as well, the perception that we are misusing tax dollars is hard to absorb.

In the end, Power Purchase Agreements may yield a better way for the state to achieve its renewable energy portfolio. This would allow many federal tax dollars to help subsidize the state's efforts.

ENERGY EFFICIENT FEATURES – UDOT EQUIPMENT

Goal One

Right size vehicles to the lowest level needed and order the smallest engine available for each. Monitor engine idle time on large trucks and light vehicles and target units with low MPG to determine why they are low and correct them. Encourage and train drivers to change driving habits for better fuel economy. Ensure vehicles are properly maintained and conduct daily walk arounds to include checks on tire pressure and vital oil levels. Ensure PMs are done on time with proper oils for that vehicle.

Past Accomplishment One. UDOT has reduced its fleet size by 102 pieces of equipment and 39 light duty vehicles since FY 2003.

Past Accomplishment Two. In 2004, UDOT started using trucks with lift axles, double-wing trucks, and dump truck mounted sweeper attachments. We also started using attenuators that are mounted to a dump truck to increase efficiency.

Past Accomplishment Three. UDOT also started the buy-back option in 2004 so we would have new graders, loaders, farm tractors, and skid steer loaders that provide the newest engine technology available.

Past Accomplishment Four. In FY 2005, UDOT started using a small F-550 truck in place of a single-axle dump truck in some applications, which saved \$5,880 per truck. At this time, UDOT currently has seven of these trucks in our fleet at a savings of \$41,160 per year in fuel cost as well as maintenance.

Past Accomplishment Five. In 2005, UDOT started the backhoe lease program. Every year, through this program, UDOT saves \$1,712 per backhoe in maintenance costs. Currently, we have 16 backhoes on this program for a savings of \$27,392 per year.

Goal Two

UDOT is retrofitting 20 dump trucks with diesel oxidation catalyst filters in order to clean up diesel emissions and lower carbon output. We are working with the Division of Environmental Quality, and they will help us document and track the reduction in carbon output. By renting equipment new and selling off older owned units, we are able to

reduce pollution output because we are now operating new cleaner Tier II and III engines in those rental units. We are in the process of increasing the use of CNG in our Bi-fuel vehicles. We will measure and track CNG usage in order to increase its use.

Goal Three

UDOT is currently burning B20 diesel in at least ten locations, which is approximately 9,000 gallons per month.

Goal Four

UDOT will right size all vehicle replacements to ensure the proper units are being purchased to do the job. We will review engine displacement, gear ratios, and fuel type for the best overall efficiency of all units.

APPENDIX I-21

DEPARTMENT OF WORKFORCE SERVICES ENERGY EFFICIENCY INITIATIVE

(Done in conjunction with Governor's Energy Efficiency Initiative)

GOVERNOR HUNTSMAN'S GOAL

INCREASE ENERGY EFFICIENCY 20 PERCENT BY 2015

To achieve the Governor's objectives, the Department of Workforce Services will implement the State Energy Efficiency Program. To meet the stated goal the Department will need to reduce energy consumption a minimum of one percent per year. Energy consumption will be reduced by concentrating on the following items:

Building Efficiency

Motor Vehicle Fleet Efficiency

Employee Awareness and Training

Building Efficiency

The department will work with DFCM to promote energy efficiency. This will be accomplished by encouraging energy conservation and by affecting steps to maximize energy efficiency in the maintenance and management of all State owned and operated facilities utilized by DWS. Also, Workforce Services will work with DFCM to implement energy audits and make changes where appropriate to ensure that all Department facilities maintained by DFCM are as efficient as possible.

For those DWS leased facilities, efforts will be made to work with Leaseholders to implement energy conservation at the leased facilities. Landlords will be encouraged to implement the steps to maximize energy conservation in the same way that DFCM is doing with State owned facilities. Where appropriate, assistance will be provided to landlords to complete energy audits of the Department's leased facilities. Cooperative efforts will be made to encourage implementation of the recommendations and ensure that energy efficiency is maximized.

Other identified steps to reduce energy consumption include the following:

1. Implement a policy to shut down all computers in employee's workstations at the end of each workday. This will significantly reduce electricity usage during non-work hours and on weekends and holidays. DTS infrastructure staff will implement software updates upon start-up of the computers rather than leaving computers on during off hours.

Action Item: The Department Communications section, along with Administrative Support, will establish an awareness campaign to promote energy conservation. The Executive Director will send an e-mail of support for this program and list items staff can do to conserve energy.

Expected outcome: DFCM will note added reduction in electrical power usage as computers and monitors shut off at the conclusion of each workday.

2. Building temperature settings will be adjusted during non-work hours to non-occupied heat or cooling levels, which are economically efficient, with ramp up for work hours so that total energy consumption is minimized. Facility heat and cooling settings should be maintained within the guidelines to minimize energy consumption.

Action Item: DFCM will be notified by the Facilities Coordinators to implement heat setback at 5:00 PM in all DFCM managed facilities. DFCM will determine proper setback point and timing to resume full heat to insure that facilities are comfortable during building hours of operation.

Expected outcome: DFCM will note additional reduction in utility expense resulting from the change in the setback time. DWS will then benefit from reduction in the operations and maintenance costs in DFCM managed facilities.

3. Encourage the use of programmable thermostats in all leased facilities, which are not controlled by computerized controls on the heat systems.

Action Item: During the annual risk management survey, the Facilities Coordinators will review the heat and cooling control and where appropriate will recommend to building owners installation of programmable thermostats.

Expected outcomes: The landlords will be made aware of the Governor's initiative and where implemented the programmable thermostats will reduce our costs thus reducing the rate at which the full service lease rates are increased.

4. Encourage staff and janitorial workers to turn off lights in non-occupied areas and or buildings maximizing reductions in energy consumption. Also, encourage the installation of motion sensors in building common areas such as break areas, storage closets, and restrooms to reduce energy consumption in non-occupied spaces.

Action Item: The Facility coordinators will work with DFCM facility managers to minimize after hours lighting utilized by janitorial services and will evaluate all facilities to determine areas in which motion sensors would be appropriate.

Expected Outcomes: Reduced energy consumption in all facilities.

5. Encourage the replacement of incandescent light bulbs with compact fluorescent light bulbs (CFL) in all facilities to reduce energy consumption.

Action Item: Incandescent light bulbs will be replaced with CFL bulbs in all DWS occupied facilities.

Expected Outcomes: Over time, the cost of replacing light bulbs will be reduced and overall energy consumption will be minimized in areas where CFL bulbs are utilized.

6. Regulate the use of space heaters by requiring use of DFCM approved heaters only where the employee has a Doctor's note stating that a heater should be provided.

Action Item: This item will be discussed at Senior Management Team meeting and the assistance of Regional and Division Directors will be enlisted to enforce the Department policy as written. Also, the use of space heaters will be verified as part of the annual risk management survey.

Expected Outcomes: Energy consumption will be reduced in facilities.

7. Regulate the use of personal refrigerators in offices and cubicles to those individuals with medical need and Doctor's authorizations.

Action Item: This item will be discussed at Senior Management Team meeting and the assistance of Regional and Division Directors will be enlisted to enforce the Department policy as written. As part of the risk management survey, a review will be conducted of all facilities to ensure compliance.

Expected Outcomes: Energy consumption will be reduced in facilities.

8. Remind staff to turn off task lighting, calculators, and personal radios during off hours to reduce unnecessary energy consumption.

Action Item: The Department Communications Director along with the General Services and Facilities Manager will develop and promote a Department wide campaign to encourage staff support and participation in personal and department energy saving activities.

Expected Outcome: Energy consumption will be reduced within Department operated facilities and within the homes of Department personnel as employees learn the value of energy conservation.

9. Encourage DFCM to utilize daytime janitorial services in State owned facilities wherever practical. This will enable a reduction in building operation hours thereby reducing energy consumption.

Action Item: The Department General Services and Facilities manager will write a memo to DFCM recommending the use of daytime janitorial services or recommending changes in the way the night-time services currently manage their operations. Buildings temperatures can be reduced earlier and lights can be

turned off when the last employees have left and turned back on when the janitorial services performs their duties.

Expected Outcome: Energy consumption will be reduced in Department facilities.

- The Department of Workforce Services will monitor the use of energy and other the implementation of other energy saving actions on a regular basis.

Action Item: The Department will work with DFCM to establish an energy usage baseline. Regular monitoring of the items listed above will be reported to the Executive Director and to the Senior Management Team.

Expected Outcome: The Department will continue to develop new and innovative ways to reduce energy consumption. Compliance with the Governor’s initiative will be documented and adjustments can be determined to ensure state goals are achieved.

Motor Vehicle Fleet Efficiency

DWS operates a fleet of 121 vehicles, which are allocated through out the state as shown in the following table:

DWS Motor Pool

Area	Mid-sized Sedans	Compacts	Vans	SUVs	Truck	Total
Administration	5	10	1		2	18
Western	14	15	7			36
Eastern	11	9		5		25
North	3	14	2	2		21
Mountainlands	4	6	2	1		13
Central	2	5	1			8
Total	39	59	13	8	2	121

Within the fleet are three CNG vehicles. The Department will make adjustments to ensure that the three CNG vehicles are utilized on CNG as outlined in the State Energy plan.

Compact vehicles will be substituted as vehicles are placed, where practical. Where vehicles other than compacts are required, the most compact-like vehicles in the class that are available will be used. For example where a Sport Utility Vehicle (SUV) is required due to the need for four-wheel drive, the smallest SUV available on contract will be

obtained. Every effort will be made to “right-size” the DWS fleet. This should aid to increase energy savings to the fullest extent possible while meeting the needs for safety and full utilization of the fleet.

Action Items: The Department will monitor the usage of vehicles and the numbers of passengers on each trip to better “right-size” the fleet. Adjustments will be made accordingly.

Expected Outcome: The Department’s fleet will be less expensive to own and operate. Energy usage by the DWS fleet should be reduced. The Department will demonstrate efforts to meet the stated objective of averaging 30 miles to the gallon within the fleet vehicles.

Employee Awareness

Workforce Services will utilize several means to create an atmosphere of employee awareness regarding the State Energy program. First, a campaign will be launched to encourage employees to reduce energy consumption through such behaviors of carpooling or using public transportation whenever practical.

A department wide presentation on the benefit of converting to compact fluorescent light (CFL) bulbs will be made to both new and existing employees. By providing flyers and other information, the financial and environmental benefits from this conversion will be demonstrated. Employees will be encouraged to take a pledge to change at least one bulb from an incandescent bulb to a CFL.

Brown bag seminars will be developed to stress the importance of energy conservation and reducing the carbon footprint. Utilizing resources from public utilities, the department will educate employees on the benefits of using energy star rated appliances and the related programs for rebate or tax credits for doing so.

The Department will encourage the use of public transportation. Utah Transit Authority (UTA) ECO Passes are provided for employees at the North Administration building where parking is limited. Free or discounted buss passes are offered at other locations, depending on access to public transportation options and mitigating parking factors.

Action Item: The Department Communications Director along with selected personnel throughout the Department will develop and manage a public awareness campaign, including items listed in this section of the plan.

Expected Outcome: Employees will have increased energy conservation awareness. Department employees will be knowledgeable about energy conservation steps they can implement at the office and at home and the potential benefits of doing so. This will result in energy conservation, a reduction of the carbon footprint, and savings throughout the Department and throughout Utah in the homes of DWS employees.

Reporting

To document the Department's efforts, regular reports will be developed to demonstrate the DWS accomplishments. In the case of the DFCM maintained facilities, Workforce Services will work with DFCM to submit reports on building energy consumption. With the leased facilities, the DWS facility coordinators will document the work completed with the landlords and record changes made. A baseline will be established working in conjunction with DFCM, local utilities and the State Energy Office. This will be regularly monitored and reported to the Senior Management Team.

In an effort to make the motor vehicle fleet as efficient as possible, a policy requirement will be established to document the number of passengers in a vehicle for each trip to aid in determining the number and the right sized vehicles at each location. Efficiency will also be demonstrated by documenting the reductions in fuel usage from right sizing the fleet.

The efforts to increase employee awareness will be documented and activities will be held and encouraged to receive feedback from employees regarding pledges to change to Compact Fluorescent Lighting (CFL) bulbs in their homes. The best practices received from employees will be exchanged to encourage others.

Conclusion

In conclusion, DWS will meet the Governor's goal through the efforts outlined above. As feedback is received the Department will constantly adjust efforts to reduce the use of energy and act responsibly to reduce the carbon footprint. This plan for the "Energy Efficiency Initiative" will be regularly reviewed and adjusted as new ideas and technology become available.

APPENDIX J

Model Year 2008 Vehicle Comparisons by Class

Vehicle Type	Fuel Type	Make/Model	Cost Effect.	Air Quality	Green. Gas	Infrastr. Avail.	Foreign Oil	EPACT	American	Total
Compact Sedan (0604)	Gasoline	2007 Ford Focus	9	7	7	9	6	1	9	7.51
	Gasoline	2007 Toyota Corolla	8	6	7	9	6	1	1	6.56
	Hybrid	2007 Toyota Prius	7	8	9	9	7	9	1	7.58
	Hybrid	2007 Honda Civic	6	9	9	9	7	9	1	7.48
	Gasoline	2007 Chevy Cobalt	8	6	7	9	5	1	9	6.85
	Gasoline	2007 Dodge Caliber	7	6	6	9	5	1	9	6.40
Midsize Sedan (0601)	Gasoline	2007 Chevy Malibu	6	6	6	9	5	1	9	6.06
	Gasoline	2007 Toyota Camery	4	6	6	9	5	1	1	5.03
	Gasoline	2007 Ford Fusion	5	6	6	9	4	1	9	5.65
	Gasoline	2007 Chrysler Sebring	6	3	6	9	5	1	9	5.32
	Gasoline	2007 Dodge Avenger	6	3	6	9	5	1	9	5.32
	Gasoline	2007 Pontiac G6	6	6	6	9	4	1	9	5.99
	Gasoline	2007 Pontiac Grand Prix	6	6	6	9	4	1	9	5.99
	Hybrid	2007 Toyota Prius	7	8	9	9	7	9	1	7.58
Full Size Sedan (0607)	Gasoline	Chevrolet Impala	7	6	6	9	5	1	9	6.40
	Gasoline	Chrysler 300	4	6	5	9	4	1	9	5.20
	Gasoline	Dodge Charger	5	6	5	9	4	1	9	5.54
	Gasoline	Ford Crown Victoria	4	6	5	9	4	1	9	5.20
	Gasoline	Ford Taurus	5	6	6	9	5	1	9	5.72
	Gasoline	Toyota Avalon	3	6	6	9	5	1	1	4.69
Police Pack (0605)	Gasoline	Chevrolet Impala PP	5	6	6	9	4	1	9	5.65
	Gasoline	Dodge Charger PP	4	6	5	9	4	1	9	5.20
Police Pack (0608)	Gasoline	Ford Crown Victoria PP	2	6	5	9	4	1	9	4.52
	Gasoline	Dodge Charger PP	3	7	5	9	4	1	9	5.11
Compact SUV (4802)	Gasoline	Jeep Liberty	3	6	4	9	3	1	9	4.68
	Gasoline	Dodge Nitro	3	6	4	9	3	1	9	4.68
	Gasoline	2008 Ford Escape	5	6	5	9	4	1	9	5.54
	Hybrid	2008 Ford Escape Hybrid	4	8	7	9	6	9	9	6.62
	Gasoline	Chevrolet Equinox	4	6	5	9	4	1	9	5.20
	Gasoline	GMC Envoy	2	6	4	9	3	1	9	4.34
Midsize SUV (4811)	Gasoline	Chevrolet Tahoe	1	6	4	9	3	1	9	4.00
	Gasoline	Chevrolet Trailblazer	2	6	4	9	3	1	9	4.34
	Gasoline	Chrysler Aspen	1	3	3	9	2	1	9	3.08
	Gasoline	Dodge Durango	1	3	3	9	2	1	9	3.08
	Gasoline	Ford Explorer	1	6	3	9	2	1	9	3.81
	Gasoline	GMC Envoy	2	6	4	9	3	1	9	4.34
	Gasoline	Jeep Grand Cherokee	1	3	3	9	2	1	9	3.08
	Gasoline	Toyota Highlander	1	6	5	9	4	1	1	3.83
	Hybrid	Toyota Highlander Hybrid	1	8	7	9	5	9	1	5.18
Full Size SUV (4804)	Gasoline	Chevrolet Suburban	1	6	4	9	3	9	9	4.56
	Gasoline	Dodge Durango	1	6	3	9	2	1	9	3.81
	Gasoline	Ford Expedition	1	6	3	9	1	1	9	3.74
	Gasoline	Ford Expedition EL	1	6	3	9	1	1	9	3.74
	Gasoline	Jeep Commander	1	3	3	9	2	9	9	3.64
	Gasoline	Toyota 4Runner	1	6	3	9	2	1	1	3.45
Trucks (0212) (LB) 2WD	Gasoline	Chevrolet Silverado 1500	4	6	4	9	3	1	9	5.01
	Gasoline	Dodge Ram 1500	3	3	3	9	2	1	9	3.75
	Gasoline	Ford F150	4	3	4	9	3	1	9	4.28
	Gasoline	Toyota Tundra	2	6	3	9	2	1	9	4.15
Truck (0213) (LB) 4WD	Gasoline	Chevrolet Silverado 1500	3	6	4	9	3	1	9	4.68
	Gasoline	Dodge Ram 1500	3	3	3	9	2	1	9	3.75
	Gasoline	Ford F150	3	3	3	9	2	1	9	3.75
	Gasoline	Toyota Tundra	1	6	3	9	2	1	1	3.45
Truck (0214) (SB) 2WD	Gasoline	Chevrolet Silverado 1500	3	6	4	9	3	1	9	4.68
	Gasoline	Dodge Ram 1500	2	3	3	9	2	1	9	3.41
	Gasoline	Ford F150	3	3	4	9	3	1	9	3.94
	Gasoline	Toyota Tundra	2	6	3	9	2	1	1	3.79
Truck (0215) (SB) 4WD	Gasoline	Chevrolet Silverado 1500	2	6	4	9	3	1	9	4.34
	Gasoline	Dodge Ram 1500	1	3	3	9	2	1	9	3.08
	Gasoline	Ford F150	2	3	3	9	2	1	9	3.41
	Gasoline	Toyota Tundra	1	6	3	9	2	1	1	3.45
Truck (0226) 2WD	Gasoline	Chevrolet Colorado	6	6	5	9	4	1	9	5.88
	Gasoline	Ford Ranger	5	6	4	9	3	1	9	5.35
Truck (0227) 4WD	Gasoline	Chevrolet Colorado	4	6	4	9	3	1	9	5.01
	Gasoline	Ford Ranger	3	6	3	9	2	1	9	4.49
Truck (0228) 2WD	Gasoline	Chevrolet Colorado	5	6	5	9	4	1	9	5.54
	Gasoline	Dodge Dakota	5	6	4	9	3	1	9	5.35
	Gasoline	Ford Ranger	5	6	4	9	3	1	9	5.35
	Gasoline	Toyota Tacoma	3	6	5	9	4	1	1	4.50
Truck (0229) 4WD	Gasoline	Chevrolet Colorado	4	6	4	9	3	1	9	5.01
	Gasoline	Dodge Dakota	3	6	3	9	2	1	9	4.49
	Gasoline	Ford Ranger	3	6	3	9	2	1	9	4.49
	Gasoline	Toyota Tacoma	1	6	5	9	4	1	1	3.83
Truck (0261) 2WD	Gasoline	Chevrolet Silverado 1500	2	6	4	9	3	1	9	4.34
	Gasoline	Dodge Ram 1500	1	3	3	9	2	1	9	3.08
	Gasoline	Ford F150	3	3	4	9	3	1	9	3.94
	Gasoline	Toyota Tundra	1	6	3	9	2	1	1	3.45
Truck (0276) 4WD	Gasoline	Chevrolet Silverado 1500	1	6	4	9	3	1	9	4.00
	Gasoline	Dodge Ram 1500	1	3	3	9	2	1	9	3.08
	Gasoline	Ford F150	1	3	3	9	2	1	9	3.08
	Gasoline	Toyota Tundra	1	6	3	9	2	1	1	3.45

Weighted Percentages: 33.82% 24.57% 11.37% 11.59% 7.16% 7.00% 4.49%

APPENDIX K

MODEL YEAR 2008 JUSTIFICATION LIST SUMMARY

DEPARTMENT NAME	VEHICLE COUNTS	REPLACEMENT IS A COMPACT	LOWEST LEVEL IN THE CLASS	EXECUTIVE VEHICLES	POLICE PACKAGE OR POLICE USE	ALL OTHERS	UPGRADE	DOWN GRADE	PERCENT DOWNGRADED	Verbal Approval by Kim Hood	Date
ADMINISTRATIVE SERVICES - DFCM	8	0	5	0	0	3	0	3	100%	Yes	5-Dec-07
ADMINISTRATIVE SERVICES (GENERAL SERVICES)	3	0	0	0	0	3	0	0	0%	Yes	5-Dec-07
ADMINISTRATIVE SERVICES (OLD TAX POOL VEHICLE)	1	1	0	0	0	0	0	0		Yes	5-Dec-07
AGRICULTURE	23	8	7	0	0	8	2	0	0%	Yes	5-Dec-07
ALCOHOLIC BEVERAGE CONTROL	1	0	1	0	0	0	0	0		Yes	5-Dec-07
ATTORNEY GENERAL	5	0	2	0	3	0	1	0		Yes	5-Dec-07
BE BOARD OF EDUCATION	4	1	2	0	0	1	1	0	0%	Yes	5-Dec-07
BE SCHOOL/DEAF & BLIND	17	11	4	0	0	2	0	2	100%	Yes	5-Dec-07
BOARD OF PARDONS	1	0	0	1	0	0	0	0		Yes	5-Dec-07
COMMERCE	5	5	0	0	0	0	0	5		Yes	5-Dec-07
COMMUNITY & CULTURE	3	2	0	0	0	1	0	2	200%	Yes	5-Dec-07
CORRECTIONS	43	1	9	1	24	8	1	4	50%	Yes	5-Dec-07
COURTS ADMINISTRATION	14	4	3	0	0	7	0	1	14%	Yes	5-Dec-07
ENVIRONMENTAL QUALITY	9	2	3	0	0	4	0	2	50%	Yes	5-Dec-07
GOVERNORS OFFICE	2	0	1	1	0	0	0	0		Yes	5-Dec-07
HEALTH	13	8	3	0	0	2	0	1	50%	Yes	5-Dec-07
HUMAN SERVICES	61	32	16	0	0	13	5	1	8%	Yes	18-Jan-07
INSURANCE DEPARTMENT	1	0	0	0	1	0	1	0		Yes	5-Dec-07
LABOR COMMISSION	2	1	1	0	0	0	0	1		Yes	5-Dec-07
NATIONAL GUARD	1	0	0	1	0	0	0	0		Yes	5-Dec-07
NATURAL RESOURCES	126	0	29	0	107	4	0	20		Yes	18-Jan-07
PUBLIC SAFETY	165	0	7	1	103	54	3	16	30%	Yes	5-Dec-07
STATE AUDITOR	1	0	0	1	0	0	0	0		Yes	5-Dec-07
TAX COMMISSION	11	6	0	1	3	1	1	0	0%	Yes	5-Dec-07
TECHNOLOGY SERVICES	12	2	1	0	0	9	0	0	0%	Yes	10-Dec-07
TRANSPORTATION	105	10	6	0	0	89	8	22	25%	Yes	5-Dec-07
TRUST LANDS ADMINISTRATION	3	0	0	0	0	3	0	0	0%	Yes	5-Dec-07
VETERAN AFFAIRS	1	0	0	0	0	1	0	0	0%	Yes	5-Dec-07
WORKFORCE SERVICES	15	12	3	0	0	0	0	4		Yes	5-Dec-07
TOTALS	656	106	103	7	241	213	23	84			

APPENDIX L

Statewide Vehicle Fleet “Cost Efficiency Plan”

House Bill 110, 2007 Legislative Session
Prepared by the Division of Fleet Operations

Section (1) – Background

In April of 2006 Governor Huntsman announced his goal of increasing the state’s overall energy efficiency 20% by the year 2015. During the following 2007 general legislative session House Bill 110 was passed to formalize how agencies with state fleet vehicles will be required to contribute to the stated energy efficiency goal established by the Governor. House Bill 110’s title is “State Fleet Efficiency Requirements” but it covers a three-fold objective from the Governor and Legislature. First, the bill is designed to reduce fleet costs or increase energy efficiency. Second and equally important, the bill is intended to improve air quality in Utah by decreasing the carbon output from state vehicles. Finally, the bill is designed to contribute to a general decreased United States dependency on foreign oil.

Section (2) – Purpose of the “Cost Efficiency Plan”

To provide a guide for agencies with state vehicles to:

1. Formally document their annual strategies to increase energy efficiency with their state vehicles.
2. Provide a consolidated reporting mechanism and tracking guide to measure the actual efficiencies accomplished during the previous year by the individual agencies.

Section (3) – Specific goals of the “Cost Efficiency Plan”

Increase overall energy efficiency 20% by 2015 in the state fleet by the following methods:

1. Decrease the overall cost per mile (CPM) average of state vehicles
2. Decrease the number of vehicles in the state fleet
3. Decrease the total gallons of fuel consumed by state vehicles
4. Increase the overall miles per gallon (MPG) of state vehicles
5. Decrease the total miles driven annually by state vehicles
 - a. DFO will also monitor “personally owned vehicle” (POV) mileage reimbursements to verify a true total reduction of state miles traveled annually.

Other “Goals”

6. “Right size” state vehicles to the lowest level vehicle type needed to perform the state business required. This will be measured in the manufacture stated miles per gallon at replacement time and will compare the existing vehicle class’ average MPG to the MPG average of the replacement class vehicle.

7. Decrease the overall pollution output by the state fleet (Measured in carbon emission from the vehicle).

The individual measures listed above will be added together against the overall energy efficiency goal of 20% (Items 1-5 above must equal at least 20%). Goal 6 is part of the larger measure in goal number 4. Goal 7 is not officially contributing to the 20% energy efficiency goal but is a significant result of the energy efficiency effort and will be measured annually.

Section (4) – Guide to the agency plans and reporting

Agency Plans

Each year by October 1st every state agency with at least one state vehicle is required to submit a bulleted list of planned energy efficiency actions to be carried out by the following June 30th. Action plan details can include further explanations as appropriate beyond the bulleted list. See Section 7 below for a list of suggested energy efficiency strategies approved by Fleet Operations.

Reporting

Each year by October 1st, every state agency with at least one state vehicle is required to submit a bulleted list of completed energy efficiency actions carried out during the previous fiscal year (July 1 to June 30). Reporting details can include further explanations as appropriate beyond the bulleted list.

Annual plans and reports will be submitted through the “secured web reports” sections of the Fleet Operations web page. To access the page please refer to: fleet.utah.gov. Select the “Reports” icon and then the “secured web reports” link. Your FleetFocus login and password will allow you to access and update the energy efficiency plans and reports required in the language of HB110.

Section (5) – Tracking form/user guide

Each year Fleet Operations staff will be tracking the process made in the seven goals outlined above. A single page spreadsheet will record the baseline information by agency and annual measurements against the original baseline number and against the previous year’s record. See attachment “A” titled “State Fleet Cost Efficiency Tracking Document.” A copy of this document will be forwarded each November 1st with the state vehicle report to the legislature to update agency process toward the 20% energy efficiency goal created by Governor Huntsman in April 2006.

Tracking form user guide

1. Vehicle cost per mile (per vehicle and per agency)
 - a. The goal would be measured at the individual vehicle level (or the replacement vehicle level).
 - b. The “life to date” figure will be the data point measured each year.
 - c. The baseline for this measurement will be June 30, 2007.
 - d. Future snapshots measured against the baseline will be on June 30th (in preparation for the November 1st deadline). Only active vehicles will be included in the snapshot (and will be compared to the original baseline (even if the baseline vehicle is out of service).

- e. Vehicles must have at least 5,000 miles and 6 months in service to be included in the data snapshot (if not the replaced vehicle will be used in the snapshot).
 - f. The cost per mile comparison between years will be adjusted for inflation based on the actual fuel, PM, and repair costs.
 - g. The cost per mile figure will include depreciation.
2. Total vehicles in the state fleet
 - a. The baseline measure will be the November 1, 2006 “State Vehicle Report” prepared by Fleet Operations and submitted to the Utah State Legislature.
 - b. DFO will track underutilized vehicles shifted within an agency to avoid the need for expansion. This efficiency will be tracked in the “didn’t need to expand” category.
 3. Total fuel used (per vehicle and per agency)
 - a. The goal would be measured at the individual vehicle level.
 - b. The baseline measurement will be from July 1, 2005 to June 30, 2006.
 - c. Future snapshots will be taken on June 30th. The annual fuel consumption measurement will always be from July 1st to June 30th.
 - d. Fleet staff will comment in the tracking measurements if agencies have a higher fuel consumption because their mission requires it. For example, heavy snow years for agencies like UDOT.
 4. Miles per gallon (per vehicle and per agency)
 - a. The goal would be measured at the individual vehicle level.
 - b. The baseline for this measurement will be June 30, 2006.
 - c. Future snapshots will be taken each month during the year, July 1st to June 30th. The average of the miles per gallon will be used to calculate the annual miles per gallon data point.
 - d. Vehicles must have at least 5,000 miles and 6 months in service to be included in the data snapshot.
 5. Annual miles driven
 - a. The goal would be measured at the individual vehicle level.
 - b. Miles because of “unique circumstances,” like heavy snow years, would be captured separately.
 - c. The amount of POV (both miles and dollars) will be tracked in this category to capture the offset of personal miles traveled for state business if there is a decrease in miles traveled in state vehicles.
 6. Right size vehicles in the state fleet to the lowest level vehicle needed to conduct state business
 - a. At replacement time a justification will be submitted by the agency when a vehicle other than a compact sedan is requested for a replacement vehicle.
 - b. The dropdown menu on the replacement list report will lead fleet contacts to choose the lowest level replacement vehicle in every class.
 - c. Vehicle reductions will be tracked at the standard class size detail. For example the report would track a replacement reduction of a midsize sedan to a compact sedan.
 - d. The measurement for this category will be measured in miles per gallon. The efficiency will be measured in a percent increase in the average miles per gallon stated by the manufacture against the standard replacement vehicle class.

7. Pollution control
 - a. Combines the contribution in items 1-6 above
 - b. Measures other pollution reductions not covered in items 1-6. For example purchasing a lower emission engine may increase the overall MPG average.

Section (6) – Goals for purchasing the most economically appropriate size and type of vehicle

Fleet Operations has designated the compact sedan as the standard vehicle replacement. See number 6 in the tracking form user guide above.

Section (7) – Cost reductions and efficiency strategies may include:

- a. Reduce engine idle time (through control systems, engine warmers, or auxiliary power units, turning off the key after 10 seconds of idling)
- b. Drive fewer miles (through combined trips, car pools, net meetings, etc.)
- c. Avoid rush hour traffic
- d. Reduce aggressive driving
- e. Provide proper preventive maintenance including:
 - i. Properly inflated tires
 - ii. Clean and replace air and other vital filters when manufacturer recommends
 - iii. Vehicle tune-ups as appropriate
 - iv. When engine MIL (Malfunction Indicator Lamp) illuminates, quickly get vehicle to approved repair shop
- f. Purchase fuel from State operated fueling sites:
 - i. Unleaded fuel is typically .10 to .12 cents cheaper per gallon at State Operated fuel locations, Bio-Diesel is now available at participating DOT locations
- g. Use the lowest octane fuel required for vehicle (Eliminate the use of Mid and High-Grade fuels when not necessary)
- h. Rightsizing vehicle type or engine/transmission configuration
 - i. Reduce vehicle size to allow better MPG rating ie. Full-size SUV, 15.5 average MPG, with a minivan, 22.5 average MPG, fuel save would equal 1806 gallons
 - ii. Downsize engine configuration (5.7 liter V8 to a 4.8 liter V8, or a V8 to a V6)
 - iii. Implement diesel applications where cost effective
 1. Diesel engines are 15 – 20% more efficient than a similar gas counter-part.
 2. Diesel fuel is more energy dense, and contains about 15% more energy per gallon.
- i. Reduce the number of commute and take home drivers in the state fleet. According to AAA each mile driven can cost 52.2 cents.
- j. Reduce the wind resistance on your vehicle
- k. Promote efficient speeds.
 - i. 55 MPH is the ideal speed for vehicle efficiency
- l. Promote the use of Cruise Control where appropriate

- m. Remove excess vehicle weight.
 - i. An extra 100 pounds in your vehicle could reduce your MPG by up to 2%
- n. Use the recommended grade of motor oil
You can improve your gas mileage by 1-2 percent by using the manufacturer's recommended grade of motor oil. For example, using 10W-30 motor oil in an engine designed to use 5W-30 can lower your gas mileage by 1-2 percent. Using 5W-30 in an engine designed for 5W-20 can lower your gas mileage by 1-1.5 percent. Also, look for motor oil that says "Energy Conserving" on the API performance symbol to be sure it contains friction-reducing additives

Section (8) – Reducing inventories of underutilized vehicles

DFO will be requiring agencies to turn in vehicles that are not driving a minimum of 625 miles per month and are not documented as a “low use” vehicle. The review of miles will be evaluated on an annual basis by DFO. Agencies will continue to receive a quarterly utilization report from DFO showing the average miles per month for the previous 12 months.

Section (9) – Education to inform drivers of their accountability on implementing cost reduction measures.

Agency fleet contacts have a responsibility to train and educate drivers in their agency concerning the energy efficiency plans determined each year by the department leadership. Agency fleet contacts also have the responsibility to track the progress made by the agency toward energy efficiency and make further educational outreach efforts to drivers that are resistant to energy efficiency plans, outlined each year by the agency’s leadership and fleet contact.

APPENDIX M



State Fleet Cost Efficiency Report 2007 Baseline Data *Administrative Services*

Measurement	Baseline
Vehicles	
Regular Monthly Vehicles	114
Seasonal Vehicles	0
Non-Mileage Vehicles	3
Total Vehicles:	117
Miles	
Regular Miles Billed	1,249,375
Daily Pool Miles	93,416
Extenuating Circumstance Miles	0
Total Miles:	1,342,791
POV Reimbursement	\$30,923.51
Total Fuel (Gallons)	94,460
Average Miles Per Gallon	13.2
Average Cost Per Mile	\$ 0.24
Total Greenhouse Gas Emissions (CO₂ Tons)	935.3

Air Quality and Right-size vehicle measurements will be based on vehicle replacements



State Fleet Cost Efficiency Report

2007 Baseline Data *Administrative Services*

Action Plan

- I. Increase Overall Miles per Gallon
 - a. Right Size Vehicles
 - i. Conduct in-depth review of each vehicles operational functions and tasks prior to replacement. How will the vehicle be used?
 - ii. Determine lowest vehicle class and engine size required to meet operational needs.
 - iii. Migrate from lower to higher MPG gasoline consuming vehicles when feasible by purchasing vehicles according to the following priority:
 1. Hybrid vehicle if available from original equipment manufacturer and the hybrid vehicle has an estimated MPG that is higher than the gasoline (petroleum-based fuel) powered alternative
 2. CNG or zero emission vehicles if available from OEM
 3. Vehicle offering highest fuel economy with an air quality score of 6 or greater as published by the EPA
 4. Shift to diesel or bio-diesel vehicles when appropriate. For example State Purchasing and General Services is in contact with the manufacturer of a box truck to see what modifications are required in order to use B-20 instead of diesel.

- b. Training by broadly communicating the benefits and opportunities for energy efficiency by training employees on best driving practices.
 - i. Training should include but not be limited to the following topics:
 - 1. Reducing vehicle idling
 - 2. Consistent and periodic tire pressure inspection
 - 3. Following preventive maintenance programs
 - 4. Where to purchase fuel at lowest cost
 - 5. Carpooling
 - ii. Post best practices on DFO and/or DAS website
- c. Monitor vehicle use via fleet focus
 - i. Monitor review and analyze critical metrics such as fuel consumed, miles driven and MPG monthly
 - ii. Track vehicles for timely compliance with scheduled PMS and notify users when vehicle is due for mileage related maintenance
 - iii. Identify and track high and poor performing vehicles
 - iv. Determine practices resulting in better performance and apply to poor performing vehicles.

II. Decrease Total Miles Driven Annually by State Vehicles

- a. Revise business practices
 - i. Maximize trip capacity
 - 1. Continue practice of combining maintenance and repair projects when feasible
 - 2. Continue efforts geared towards planning efficient delivery routes and investigate feasibility of using route planning programs in realizing efficiencies
 - 3. Institute practice of ridesharing/carpooling when feasible
 - ii. Continue program of automating fuel monitoring systems in the fuel network

- iii. Use teleconferencing when feasible. DAS has requested information on using the State's teleconferencing facilities and will analyze the feasibility of using it to conduct State business.
 - iv. Permit telecommuting where appropriate
- III. Right Size Your Vehicle Type. This is a critical component of the DAS goal of increasing overall MPG.
 - a. Divisions with vehicles are currently in the process of reviewing each vehicle's operational function in order to determine the lowest vehicle class and engine size required to meet operational need. At replacement, priorities established will be utilized in order to insure that vehicles migrate from lower to higher MPG gasoline powered vehicles.
 - i. Air quality and right size vehicle measurements will be based on vehicle replacements

Air Quality and Right-size vehicle measurements will be based on vehicle replacements

APPENDIX N

Alternative Fuel Use

Department Name	Product Description	Feb-07	Mar-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07
ADMIN SERV REASSIGNMENT	COMPRESSED NATURAL GAS (CNG)							3	8.8	
ADMIN SERVICES DAILY POOL								5.17		
ADMINISTRATIVE SERVICES		565	74	39,534	41,117	41,456	42,785	40,477		26.56
AGRICULTURE		3	2	1	2	2	1			
BE BOARD OF EDUCATION		40,483	24,819	47,704	82,826	70,013	93,188	15,059	8	4
BE SCHOOL/DEAF & BLIND		18	17,966			5,986	5,85	1		
BR UNIVERSITY OF UTAH		991,818	759	412.13	327,969	546,956	517,964	475,198	347.54	413.24
BR UTAH COLLEGE OF APPLIED TEC		11.29	10,774	4.66			5.16	10.41		
BR UTAH STATE UNIVERSITY		1460,889	1513,366	504.89	186,714	464,499	1612,409	1794,375	1446,923	765,274
COMMUNITY & CULTURE		1	1		1			1	1	
COURTS ADMINISTRATION		7.48	8,087	23,826	16,078	21,21	10,759	11,63	6.6	12.19
ENVIRONMENTAL QUALITY									1	3
GOVERNORS OFFICE				1,671	67,611	165,687	93,433	76,24	28,51	65.83
HEALTH								4,515		2
HUMAN SERVICES		74	50	29,984	40,746	30.6	39,063	21,989	11,25	12.76
NATURAL RESOURCES		6	8	7	3	7	7	3	4	3
TAX COMMISSION		2	4	8	2	5	2			
TRANSPORTATION		11,526	9,808	19.6		9,256	34,308	35,51	47,565	56.72
		Total CNG Gallons								
		3192	2483	1100	771	1370	2465	2499	1911	1365
BR SALT LAKE COMMUNITY COLLEGE	E-85	155.4	78.3	122.5	82.2	64.9	113,967	113,134	61.4	45.1
ADMIN SERV REASSIGNMENT	DIESEL B20			12			7.4			
ADMINISTRATIVE SERVICES				27	63.1	124	105.7	5.4		
AGRICULTURE						88	97	65		
BR UNIVERSITY OF UTAH				8660	8312.9	10807.8	9693.6	10942.8	9515.3	647.7
BR UTAH STATE UNIVERSITY				45.9	179.5	269.7				
COMMUNITY & CULTURE				40.6	69.5	73.1				
CORRECTIONS				50.4	110.8		58.3			
HUMAN SERVICES						10.4	62.5	66.4		
NATURAL RESOURCES				31.5	52.7	133	183.3	79.8	74	
PUBLIC SAFETY						24.9			265.3	
TECHNOLOGY SERVICES				68.9	47	48	35		38.9	
TRANSPORTATION				9492.9	11972.6	23906.1	12548.2	7080.3	4753.4	1270.8
		Total Bio-Diesel B-20 Gallons								
				18429	20808	35485	22791	18240	14647	1919
		Total Alternative Fuel Gallons								
		3348	2561	19652	21661	36920	25370	20851	16619	3328