



2009 Greening Government Annual Report Card

Prepared by the Governor's Greening Government Council



"The daily activities of State government have a significant impact on the quality of Colorado's public health, environment and use of its natural resources. This order charges State departments, agencies and offices to take a position of leadership in the new energy economy by reducing state energy consumption, increasing state use of renewable energy sources, increasing the energy efficiency and decreasing the environmental impact of the state vehicle fleet, implementing environmental purchasing standards and requiring attention to energy and environmental impacts of purchasing and materials decisions."

Governor Bill Ritter, Jr.

Executive Order D0011 - April 16th, 2007

Introduction

The Greening Government Council (GGC) is required by Executive Order to prepare an annual report card for review and to inform recommendations for additional action by the Governor. Representatives have been selected from each state department and agency to serve on the GGC, which is coordinated by the Greening Government Program Manager. Greening Government goals identify FY2005 as a baseline and are to be achieved by June, 2012. This report card covers the FY2009 period – a significant year that marks the halfway point in achieving the goals.

Many quality programs are in place and significant accomplishments have been made toward achieving the Greening Government goals. These efforts and the associated investments will save taxpayer dollars by reducing energy bills and hedging against future price spikes in fuel and electricity. At this critical halfway milestone, comprehensive quantitative data exists for one of the goals – petroleum use reduction. Significant work remaining includes implementing systems for measuring progress for the remaining greening government goals: energy, water and paper. The GGC recognizes this review as a way to acknowledge objectively the accomplishments and identify the lacking system components that hinder progress.

Summary of Accomplishments

- **Energy Performance Contracting (EPC)** is currently implemented in a robust way. The results of the control measures associated with these projects, combined with the potential energy savings benefits of the Qualified Energy Conservation Bonds (QECBs) program recently rolled out by GEO will have important effects, but these will require time to be recognized. Page 8
- **EnergyCAP** is an energy tracking software purchased by the GEO and is now available to all state agencies. Use of this software will enable consistent and accurate reporting of statewide progress toward energy and water consumption reduction goals. The Department of Personnel and Administration's Central Services Integrated Document Solutions (IDS) staff has been contracted for some EnergyCAP data entry and has made significant progress in developing tools and procedures to make this data entry occur efficiently and quickly. Page 9
- Several agencies are positioned to take – and have taken – actions that result in **significant energy and water reductions** in large buildings and facilities they operate and manage. Many agencies are in "leased space" where capital improvements are not under their control, and their efforts cannot be

REDUCTION GOALS BY JUNE 30, 2012

Energy Management at State Facilities:

- **20% energy consumption** (10% if EPC is not feasible)
- Assess and implement **renewable energy** state projects where effective

Materials and Resource Reduction:

- **20% paper use**
- **10% water consumption**
- Employ **purchasing policies** to reduce the state's environmental impact

Vehicle Petroleum Reduction*:

- **25%** volumetric reduction within State Fleet

*excluding vehicles used for law enforcement, emergency response, road maintenance, and highway construction

differentiated from those of other building tenants; however, these agencies continue to strive to achieve the goals through the means available to them. Page 10

- **Solar energy projects** have been developed at higher education institutions using third party Power Purchase Agreements (PPAs). These agreements result in state agencies receiving favorable and predictable electricity pricing without the ownership costs and issues. Page 11
- **Petroleum use reductions** are quantifiable using a very robust and accurate web-based data management system called MyCARS. Reductions of 11.6% toward a goal of 25% have been achieved, nearing the halfway mark. Much of this progress was from the replacement of fleet vehicles with hybrid vehicles and use of alternative fuels. Page 13
- **Water** reduction achievements have been made by several agencies that manage large buildings and facilities, resulting in over 158,000 kilo-gallons (kGal) of water diverted. Many agencies across the state are positioned to take similar action. Page 14
- **Recycling** in state offices is commonplace and very effective at reducing waste sent to landfills. In the capitol complex buildings alone, recycling resulted in 133 tons of diverted material. A “zero waste” goal from construction of new buildings and operation and renovation of existing facilities is currently an accepted agency culture where applicable. Page 15
- The new **Environmentally Preferable Purchasing (EPP)** policy was introduced in 2009 and it will help all agencies reduce their environmental imprint. Results attributable to this policy may not yet be measurable. Page 15
- Unquantifiable results like **increased employee awareness** are being achieved across all agencies.

Tracking Challenges

- There is **no centralized system** in place to measure energy and water reductions. EnergyCAP is being adopted by many, but not all agencies. Its implementation requires input from utility bills that are often difficult to locate, especially for the 2005 baseline fiscal year through 2007. This effort is needed to establish baseline values for water and energy consumption. Absent these baseline values, measuring progress towards goal achievement is hindered.
- A well-designed and effective database tool – **GEO Track** – for tracking the energy and water reduction results attributable to Energy Performance Contracting is in place. Because GEO Track is new, this tracking mechanism has not yet been populated with sufficient information to produce consistently reliable data.
- Agencies are not consistently tracking **paper use**. Paper use is reported by vendors that are operating under state price agreements. These vendors report expenditures on a statewide basis, but this level of data may not be captured for analysis on an agency basis. The data coming from vendors does not provide sufficient detail to report accurately quantities of paper. Currently there are no systems in place to provide data that is useful in describing the baseline and progress towards paper use reduction goal.
- Despite strong efforts at recycling that occur throughout most agencies, **waste reduction** volume is not consistently measured. This is often the result of building owners not providing tenant-specific information to agencies and the limitations of waste and recycler hauler system capabilities to capture volumetric measurements.
- Agencies in **leased space** do not receive consistently information specific to their actions, making progress difficult for them to measure. This may hinder evaluating their greening government efforts.

Implementation Challenges

- **Water consumption reduction** efforts have been overshadowed by measures taken to reduce energy consumption. Some progress has been made, but this is not a strong push compared to energy.
- **Non-disclosure restrictions** encumbered in complex contract documents used for solar third-party Power Purchase Agreements Due to contractual agreements that include **non-disclosure restrictions**, they may not be transferrable to other projects.

- **Economic downturn** has restricted staff and budget resources from gathering data, implementing systems and tracking progress towards the greening government goals.
- Some **HVAC upgrades** may create higher energy consumption, but a more comfortable and productive environment for employees (e.g., those that provide cooling where there was no cooling previously; or new heating distribution systems that replace originally under-designed systems). In some instances, achieving a lower kW/ton of cooling may require water cooled equipment, thereby sacrificing water to lower energy consumption. Increased plug-loads and more energy intensive computer equipment (and

Agency	Renewable Energy		EPP Purchasing		Water		Waste		Energy Savings		Transportation	
(* = located in leased space or joint operations; possibly limiting options for greening government activities.)	Photovoltaic (PV), Solar Thermal (ST), Biomass, Wind, Geothermal, Ground Source Heat Pump (GSHP), Anaerobic Digestion (AD)		Yes, No, or Continuing beyond 2009		Xeriscape, Plumbing, Irrigation Optimization (IO), Reuse Water (RW), Education and Advocacy (E&A)		Recycling, Composting, Electronics, Paperless Office Efforts (POE), Printing Reduction (PR)		Technical Energy Audit (TEA), Energy Performance Contracting (EPC), Tracking Energy Use (TEU), Equipment Efficiency Upgrades (EEU), Employee Education (EDU)		Eco Pass (EP); Carpool, Videoconferencing, Vehicle Mile Reduction (VMT), Flex Fuel Vehicles (FFV), Hybrid Vehicles (HV), Driver Education (DE)	
	2009	2010 Plans	2009	2010 Plans	2009	2010 Plans	2009	2010 Plans	2009	2010 Plans	2009	2010 Plans
Agriculture			Y	C	E&A	E&A					EP, FFV	EP, FFV
Corrections		PV, B, W, AD	C	C	IO	IO	R, C, E, PR	R, C, E, PR	TEU, EEU	TEU, TEA, EEU, EDU	C, V, FFV, HV, DE	C, V
Education*			Y	C			R, POE, PR	R, POE, PR			EP, C	EP, C
Governor's Office*			Y	C	E&A		R, E, PR	POE	EEU		EP, FFV, HV, DE	V
Health Care Policy & Financing*			Y	C			R, E, POE, PR	R, E, PR, POE	EPC, EEU, EDU	EEU, EDU	EP, C, HV	EP, C, V, HV
Higher Education*							R, E, PR	R, E, PR	EPC	EPC	EP, V	EP, V
Human Services	ST	ST	Y	C	IO, RW, P, E&A	IO, RW, P, E&A	POE	POE	EPC, TEU	EPC, TEU	FFV, HV	FFV, HV
Labor/Employment		PV, ST	Y	C	P, X	P, X	R, E, POE, PR	R, E, POE, PR		TEA, EPC, EEU, EDU	EP, C, FFV, DE	EP, C, FFV, DE
Law*			Y	C			R, E, POE	R, E, POE	EDU, EEU, TEA	EDU, EEU, TEA	EP, VMT, FFV, HV, DE	V, EP, VMT, FFV, HV, DE
Local Affairs*			Y	C			POE, PR	POE, PR	EDU	EDU	HV, VC	HV, VC
Military/Vet Affairs		PV, GSHP	Y	C	P	P	R			EEU		
Natural Resources*			Y	C	E&A	E&A	POE, PR, R	POE, PR, R	TEU, EEU, EDU	TEA, TEU, EEU	EP, C, V, VMT, FFV, DE	EP, C, V, VMT, FFV, DE
Personnel & Admin.	PV, GSHP	PV, GSHP	Y	C	X, P, IO	X, P, IO	R, PR	R, PR	EEU, TEA, TEU	EEU, TEA, TEU	EP, C, FFV, HV, DE	EP, C, FFV, HV, DE
Public Health & Env.*		PV	Y	C	X, P, E&A	P, E&A	R, C, E, POE, PR	R, C, E	EEU	TEA, EEU	VMT, HV	VMT, HV
Public Safety*			Y	C			R, POE, PR	R, POE, PR	TEU, EEU	TEU, EEU	C, V, VMT	C, V, VMT
Regulatory Agencies*			Y	C			R, PR	R, PR	EDU	EDU	EP	EP
Revenue*			Y	C			R	R, POE, PR	TEA		EP	EP
Secretary of State*			Y	C			R, POE	R, POE	EEU, EDU	EEU, EDU	EP	EP
Transportation			Y	C	X, RW	X, RW	R, POE, PR	R, E, POE, PR	TEA, EPC	TEA, EPC, TEU	EP, C, V, FFV, HV, DE	EP, C, V, FFV, HV, DE
Treasury*			Y	C			R, POE, PR	R, POE, PR	EEU, EDU	EEU, EDU	EP	EP

2009 Agency Highlights

Department of Agriculture:

Although located primarily in leased space, significant reductions from the baseline were achieved for electricity and gas consumption in department-owned buildings. The department achieved a 21% reduction in petroleum use for its 132 State Fleet vehicles.

Department of Corrections:

These activities are employed to help meet greening government goals: implementing EnergyCAP software; auditing utility invoices prior to payment; making energy efficient equipment purchases; composting farm and other wastes; recycling office waste; working with three Energy Service Companies; drawing upon utility providers' resources and programs to reduce energy demand costs; investigating solar PV, wind, biomass, anaerobic digestion, and geothermal renewable energy resources; switching to irrigation using non-potable water sources; repairing water leaks; using water-saving laundry equipment; increasing electronics recycling; using alternative vehicles and fuels; reducing equipment idling time; replacing high miles-per-gallon vehicles; using electronic documents and paper-saving printing techniques; improving delivery logistics to reduce trips; carpooling; using web-based rather than in-person training; and teleconferencing.

Governor's Energy Office:

Advancing energy efficiency and renewable, clean energy resources; facilitating and advocating statewide greening government activities including designing programs using federal stimulus funds; using flex-fueled and hybrid vehicles; recycling office waste; working towards significant reduction in paper use, and adding energy efficiency upgrades.

Department of Labor and Employment:

Activities were implemented to support certification of Leadership in Energy and Environmental Design (LEED) for Existing Building certification in 2010 for a major office building location. CDLE works with landlords and property managers to institute green practices; purchased or leased full duplex printers; uses single-stream recycling; and participated in electronics recycling events in 2009.

Department of Health Care Policy and Financing:

Greening government activities include green construction practices: using low VOC paint, using an existing carpet remnant instead of new carpet, salvaging materials, used refurbished/remanufactured office cubicles; personal electronics recycling event for state employees; transportation fair to encourage employees to use public transportation and carpooling; education about air quality and energy through the Take Your Daughters and Sons to Work Day program; recognition program called "Grudos to Coworkers" (aka "green kudos"); electronic document archiving/scanning; environmentally preferable purchasing of new equipment including computers, monitors, printers, paper, supplies, etc.; decrease in paper usage and printing.

Department of Higher Education:

Highlights from schools in higher education: LEED® certification (Western State certified one at Gold level); energy performance contracting; biomass and solar renewable energy projects; purchased renewable energy and carbon offsets; utility tracking software; electric and flex-fueled vehicles; on-campus biofuels; commuting reduction programs; EPP; recycling and composting. Auraria Campus purchased approximately 3 yrs worth (starting July 1, 2009) of wind energy credits to offset campus electricity use through the Sustainable Campus Program (a student fee that was assessed to fund sustainable projects on the campus).

Department of Human Services:

DHS controls 3,917,585 square feet in 343 buildings; implemented \$31 million Energy Performance Contract (EPC); spent \$12 million in buildings automations systems, resulting in a ranking in the top 5 largest Siemens systems in Colorado; High Performance Certification Program Committee incorporating LEED principles; pursuing LEED Gold certification for Veterans' Nursing Home at Homelake and Youth Services Center in Adams County; using EnergyCAP to track and optimize utility use; water conservation through web-based irrigation, non-potable water used for irrigation, low-flow toilets, and pool covers.

Department of Law:

Motion sensors for lighting in all conference rooms and first floor offices; videoconferencing installed in first floor conference room; all department vehicles are flex-fueled or hybrid (including one Chevrolet Cobalt); ENERGY STAR equipment (refrigerators and computers); EPP for toner cartridges.

Department of Local Affairs:

Use of hybrid vehicles and videoconferencing reduced petroleum consumption by 18% in 2009 vs. FY2005 baseline; use ENERGY STAR products and employee behaviors to save energy.

Department of Military and Veterans Affairs:

DMVA installed a boiler replacement at the Aurora Armory and a cooling and ventilation (AHU) upgrade at the headquarters facility. Paper recycling was initiated with impressive first 3 months results: 5,940 pounds of paper was recycled, "saving" 243 trees.

Department of Natural Resources:

Division of Wildlife:

Energy conservation measures include: controlling plug loads, window and HVAC replacements, ceiling insulation upgrade, aligning HVAC use with building occupant use, and building configuration upgrades.

Division of Water Resources:

Limit home and office appliance energy consumption; Employee Behavior Tracking System for monitoring individual energy consumption; encourage non-driving initiatives: satellite remote monitoring of field data, replace paper with electronic documents, and commuting alternatives.

Colorado Water Conservation Board:

ENERGY STAR appliances and computers; at 1580 Logan – individual lighting controls and temperature controls; at 1313 Sherman – elevator improvements; continued work on statewide water conservation issues.

Department of Personnel and Administration:

The Colorado State Capitol is the first and only state capitol in the country to receive any type of LEED® certification, and the first building of any kind to receive the LEED for Existing Buildings Operations and Maintenance designation. The Governor's residence received the first LEED for Existing Buildings 2.0 certification in the nation. Other highlights include: 100 kW photovoltaic system at Dept of Revenue managed building (1881 Pierce Street); Governor's Residence Ground Source Heat Pump System and new high efficiency boilers; DPA/Capitol Complex state-of-the-art web based sprinkler control system for State Capitol, Lincoln Park and Governor's residence; low water urinal and toilets; comingled and paper recycling program set up in all DPA/Capitol Complex buildings – tracked monthly; reduced parking rates for state employees that car pool.

Department of Public Safety:

CDPS is participating in the EnergyCAP program for tracking of utility/energy consumption. Colorado State Patrol is leading this tracking effort on behalf of the department. State Patrol uses refurbished laptops for patrol car Mobile Data Computers (MDCs). The department uses ENERGY STAR appliances and energy efficiency construction. Staff utilizes video conferencing, conference call meetings or computer (desktop sharing) meetings whenever possible. Other greening government activities include: electronic document handling, duplex printing, videoconferencing, car-pooling, energy conserving actions and equipment, using reusable kitchenware, and employee delivery of recyclable materials to a local recycling center for locations where office recycling services are unavailable. The recycle program at the State Patrol garage for FY2009 recycled 16,000 pounds of metal; 1400 tires; 150 vehicle batteries; and 50 light bars and miscellaneous equipment that were refurbished and given to other law enforcement agencies rather than thrown away or turned into scrap.

State Purchasing Office:

The state's first Environmentally Preferable Purchasing (EPP) policy was released in June 2009. In addition to environmental benefits, this policy will contribute to sustainable economic growth within the State of Colorado and is expected to reduce state operating costs.

State Fleet Management:

The State of Colorado was ranked in the top 50 of the Best 100 Fleets Nationwide; and received a rank of Number 8 of the top 40 Green Fleets in the US.

Department of Public Health and Environment:

Efforts resulted in a 22.5% reduction in petroleum consumption; 17.5% reduction in reimbursed vehicle miles; 25% reduction in paper use; 16.5% reduction in water use; 1.2% increase in energy use due to additional building space since baseline – 4.8% reduction not counting acquired space; and composting option added for 75% of buildings. Paper purchases are a minimum of 30% post-consumer recycled content. The department developed plans for a 100 kW PV system at Argo Mine water treatment plant to be installed at the Argo Mine during early 2010.

Secretary of State:

The department created online documents for customer access and paper reduction, and uses energy efficient computers.

Department of Transportation:

Early in 2009, CDOT established a Greening Council to facilitate the department’s greening efforts. This team prepares an agency-specific annual report to inform CDOT’s Executive Management Team (EMT) about greening activities and provides recommendations for future sustainability systems. CDOT is: preparing to use EnergyCAP to track utility consumption; uses videoconferencing to reduce Vehicle Miles Traveled (VMT); purchases ENERGY STAR compliant equipment; participates in recycling at offices and facilities; adopts green construction practices for new construction and renovations; uses electronic documents and duplex printing to reduce paper consumption; encourages employees to recycle personal electronics; and works with State Fleet to evaluate new diesel technology for fleet equipment.



Goal-Specific Results

Energy Use Reduction - 20% Goal

Energy Performance Contracting For Projects Started in FY2009

Energy Performance Contracting (EPC) – financing energy performance measures based on future energy bill savings – is an effective way to reduce energy consumption immediately and to save money over time. The financial mechanism typically results in agency energy savings between 15-40%.

Four Higher Education entities started Energy Performance Contracts in 2009. Upon completion of the projects, this will result in total annual cost savings in excess of \$1.6 Million. The estimated project costs and total savings (water, energy and operations & maintenance) from these projects are:

Agency	Project Costs	Estimated Annual Savings
Colorado Community College System -- Lowry	\$1,545,758	\$196,959
Colorado Department of Human Services	\$9,922,214	\$1,054,276
Colorado Northwest Community College*	\$6,493,084	\$108,585
Northeastern Junior College	\$2,466,631	\$440,965

*This project involved necessary building up-keep measures that led to a longer than typical payback period. Actual financed amount for this EPC will pay back within the contract's term (<20 years).

During FY2009, Energy Performance Contracting was also ongoing at 73% of state agencies. The following departments were involved in Energy Performance Contracting:

- Agriculture
- Corrections
- Education
- Human Services
- Natural Resources
- Personnel and Administration
- Public Health and Environment
- Transportation

Pre-FY2009 Energy Efficiency Measures

Department of Personnel & Administration (DPA) Capitol Complex manages the buildings that house these departments as essentially "leased space." This arrangement creates a situation where these departments are not typically involved in implementing energy performance measures, but play a more passive role as tenants.

- Camp George West
- Governor's Residence
- Health Care Policy & Financing
- Human Services
- Law
- Legislative Services
- Local Affairs
- Natural Resources
- North Campus
- Office of Information Technology
- Public Affairs
- Public Education
- Public Safety
- Regulatory Agencies
- State Capitol

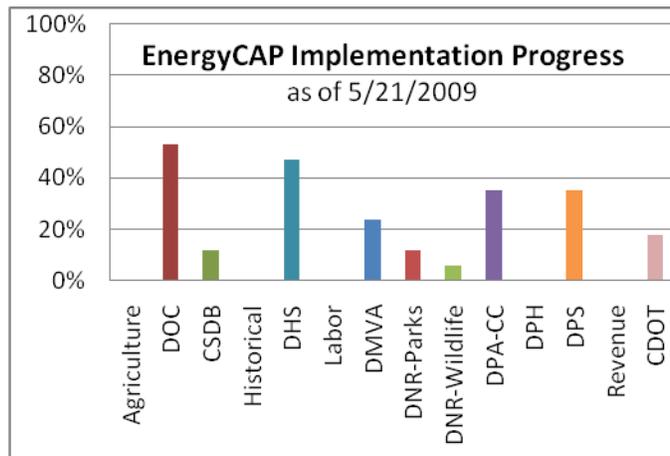
DPA Capitol Complex managers were “early adopters” of energy efficiency measures that resulted in significant energy savings prior to the 2007 Executive Order. These early efforts leave fewer opportunities to reach current goals. Here are the results of the early actions taken by DPA Capitol Complex managers.

CAPITOL COMPLEX & GRAND JUNCTION TOTALS USING 03-04 AS BASELINE					
	Electricity (KwH)	Electricity (Demand) (KW)	Natural Gas (Therms)	Water & Sewer (Kgal)	Steam (mlbs)
FY 03-04	34,414,082	119,836	104,761	29,373,019	36,179
FY 05-06	30,751,910	71,292	165,845	31,487,166	22,947
FY 08-09	30,289,664	70,091	178,032	27,078,888	18,969
% change From Base Yr. 03-04	-12.0%	-41.5%	69.9%	-7.8%	-47.6%
% change From Base Yr. 05-06	-1.5%	-1.7%	7.3%	-14.0%	-17.3%

Tracking Energy Consumption Reduction

EnergyCAP

Tracking energy consumption is necessary to make effective reductions. EnergyCAP software provides capabilities to track both energy and water utilities, and it is recommended by the GEO as the standard statewide utility management software. This software allows state agencies and organizations to manage utility usage, report on benchmarks, eliminate billing errors, target wasteful facilities, and track greenhouse gas emissions. As of May 21, 2009, nine agencies were using the EnergyCAP software.



Tracking Challenges

Tracking energy use is not being done consistently throughout state agencies. This is caused by:

- Some agencies are in private leased space and do not have access to energy consumption data pertaining to their leased facilities.
- Decentralization of accounting systems in the past results in multiple, but sometimes unusable tracking systems for energy and water utility tracking, making it difficult to estimate energy and water use based on costs.
- Utility bills are not available from many agencies that reach back to the baseline year of FY2005, making evaluation of the progress in meeting Greening Government energy reduction goals challenging.
- Agency resources to locate utility bills, relate them meaningfully to in-the-field accounts and meter numbers are very limited.
- Limitations in agency resources to learn the EnergyCAP software and enter data have precluded consistent implementation.

Energy Savings Agency Examples

Despite these difficulties, data on progress related to energy consumption savings is available from several agencies and is presented here. In this table, the million British thermal unit (MMBtu) value represents a combination of the electric and gas utility consumption. The values shown represent the percentage of progress towards reaching the goal for energy consumption reduction. For example, the Department of

Personnel and Administration is 66% of the way to achieving the 20% consumption reduction goal for their agency.

Agency	% Actual Savings to Goal kWh (electric)	% Actual Savings to Goal Therms (gas)	% Actual Savings to Goal MMBtu (combined electric and gas)
Agriculture	2%	24%	14%
Human Services	64%	41%	44%
Personnel & Administration	91%	15%	66%

Energy savings can also be achieved by constructing or operating buildings that meet qualifications to become High Performance Buildings. Certification programs exist to recognize these buildings. The requirements to achieve this status include energy, water and waste reductions, among other important attributes. The Office of the State Architect provides the list of state buildings that have achieved designation under high-performance certification programs.

Office of State Architect, High Performance Certification Program Buildings, January 2009

Agency	LEED – New Constructions			LEED – Existing Buildings		
	Gold	Silver	Certified	Gold	Silver	Certified
DPA						5 completed
DOC	1 in start up					
CDLE			1 completed			1 in review
Historical Society	1 in design					
DMVA					1 completed	
Higher Ed Institutions						
CU – Boulder*	2 completed 2 design 6 construction			1 completed	1 completed 1 construction	
CU – Colorado Springs	1 design	2 construction 1 design				
CSU – Ft Collins	1 completed 1 construction	1 completed 2 construction				
CSU – Pueblo				1 startup		
Fort Lewis College	1 design	2 construction				
UNC		1 design				
Western State College	1 design 1 review 1 construction					
School of Mines	1 design 1 construction					
Northwestern Community College	1 start up					
Front Range Community College	1 start up					
Morgan Community College	1 start up					

Renewable Energy

Solar Energy Projects

The Department of Personnel and Administration implemented these two photovoltaic (PV) projects during 2009:

Project	Cost	Rebate	Size	kWh Savings
State Capitol	\$67,398	\$32,919	9.9 kW	\$13,548
1881 Pierce Street	\$627,254	\$198,720	99.8 kW	\$134,500

In addition to these two Department of Personnel and Administration projects, solar energy projects were completed over a six month period during FY2009 at the state-owned facilities identified below. For these projects, the GEO provided approximately 15% of the total system cost for solar hot water projects and 18.75% of the total system cost for photovoltaic installations. The solar hot water installations ranged from swimming pool heaters to a water pre-heat system for a waste-water treatment plant; the PV installations provide electricity to universities.

2009 Solar Energy Projects (State-Owned Facilities)

Installation Location	Installation Type: PV= Photovoltaic; SHW = Solar Hot Water	Cost	Rebate	Size - kW for PV, kWe for SHW	BTUs	kWh savings
Northwestern Colorado Community College, Rangely	PV	\$58,941	\$11,051	5.04		7560
Western State Community College, Gunnison	PV	\$48,100	\$15,186	5.4		8100
Colorado State University, Fort Collins	PV	\$129,475	\$35,000	18.9		28350
University of Colorado at Colorado Springs	PV	\$105,374	\$20,374	13.056		19584
HomeLake Veterans Housing Cente, Monte Vista	SHW	\$65,144	\$9,772	23.43	440000	91236.42
Western State Community College, Gunnison	SHW	\$28,344	\$7,500	69.225	1300000	269562.15

*Due to contractual agreements that include non-disclosure restrictions, the complex contract documents used for solar third-party Power Purchase Agreements at some Higher Education facilities may not be transferrable to other projects.

Petroleum Use Reduction - 25% Goal

State Fleet

Since the baseline of FY2006 (note: due to data issues, FY2006 is used as baseline for petroleum reduction goal) the Colorado State Fleet has seen an 11.6% reduction in petroleum use – near the halfway mark of reaching the 25% goal. This translates to 299,869 gallons of unused petroleum. The chart below lists accomplishments by department.

FY2009 Fuel Usage Report

Dept.	FY 2006 Petroleum Baseline (gals)	FY 2009 Petroleum (gals)	Petroleum Reduction % Change from Baseline
Co. Dept of Public Services	0	179	0
Co. Dept. of Ag.	59397	52839	-11.04
Dept of Corrections	432327	417110	-3.52
Dept. of Education	8240	7469	-9.36
DOH	62961	48803	-22.5
Dept. of Higher Ed.	191360	163157	-14.7
Dept. of Human Services	205754	180301	-12.4
Dept. of Law	10284	9720	-5.5
Dept. of Local Affairs	29117	23871	-18.0
Dept. of Labor & Empl.	29269	30746	-5.0
Dept. of Military Affairs	10761	10582	-1.7
Dept. of Natural Resources	597663	523534	-12.4
Dept. of Revenue	124735	117907	-5.5
Dept. of Regulatory Agencies	74930	67431	-10.0
DOS	16	607	+36.8
Dept of Transportation	630002	511647	-18.8
GOV	69056	66496	-3.7
GSS	5209	8188	+57.2
Judicial	30365	30990	+2.1
Totals	2,571,445	2,271,576	-11.66

The State Fleet has been steadily implementing greening initiatives. State Fleet policy has been to replace 5% of the vehicles with hybrid electric vehicles (HEV) each year – a total of 400 HEVs to date; and 5% of vehicles added to the fleet are flex fuel vehicles (FFV) each year – over 1000 to date. Although the replacement vehicle plan calls for 194 vehicles to be replaced with hybrids during 2010, recent budget challenges in 2010 temporarily halted these replacements. Postponing or cancelling future implementation of vehicle replacement plans will slow progress towards the 25% petroleum reduction goal.

Here are some other activities undertaken by State Fleet to lower petroleum consumption:

- State Fleet was awarded a grant to get 40 new plug-in hybrids in FY 2010 that run on E85. These vehicles will have double the fuel economy of many existing fleet vehicles.
- In FY2009, State Fleet developed four policies: Vehicle Miles Traveled (VMT) reduction (that reduced 1 million VMTs in FY2009); anti-idling; E-85 usage; and

Colorado Dept of Corrections

The CDOC fleet has increased by 34% since 2006, and yet petroleum use was reduced by 3% in 2009 simply by teleconferencing and telecommuting a few more days a year.

biodiesel usage.

- The custom built MyCARS online website accurately tracks fuel usage and allows access for state employees to monitor their petroleum reduction strategies.
- The Environmentally Preferable Purchasing (EPP) policy is used to purchase Green Products for vehicle shop parts and supplies.
- Fleet did a pilot project on approximately 20 *Telematics* units – systems to measure real-time driver behaviors such as idle time, speeding, and erratic driving. The intent is to achieve fuel use reductions through behavior change.
- To facilitate state driver use of E-85, Fleet purchased its own E85 fuel site near the Capitol and two portable E85 fuel trailers will be deployed in FY2010 at the CDOT facility at Colfax and Tower Road and at the Colorado State Patrol shop located in Camp George West.
- A summer 2009 restriction on the commuting program will further reduce VMT.
- Fleet provides training sessions monthly at on-site state training events to explain how to effectively utilize the petroleum reduction resources.

EcoPass

The State entered into an agreement with RTD in 2009 to increase ridership and participation in the Eco Pass program. For the 2009 program year, 4,706 RTD Eco Passes were sold to the state and its employees.

Water Use Reduction - 10% Goal

Water use reduction projects implemented in FY2009 involved xeriscaping, use of waterless urinals, low-flow toilets, low-flow faucets at sinks and showers, repairing leaks, electronic controls for landscape sprinkling systems, water meter upgrades, and motion sensors for wash basins. Other efforts involve using non-potable water for irrigation rather than treated water.

Water savings are also an important component of Energy Performance Contracting. Although progress in reducing water use is being made by several agencies, measurements for baseline and volume saved are not readily available consistently across all agencies. Consistent, statewide use of EnergyCAP software will be helpful in measuring and managing this important aspect of greening government.

Four agencies started projects with a component of water savings during 2009. A summary of how these projects impacted the progress towards attaining the goals for that agency appears in the table below.

Projects Reporting Water Savings During FY2009 (due to data issues, FY2006 baseline is used for water savings goal)

State Agency	Project	Water Savings				
		Baseline Water Use (FY06)	Reduction Goal (20% of Baseline)	Actual Savings	Progress Towards Goal	Percent Actual Savings to Baseline Use
		kGal	kGal	kGal	%	%
Department of Corrections*		709451	141890		0%	0%
Department of Human Services		6322311	126462	77096	61%	12%
	Phase I Fort Logan	47972	9594	2777	29%	6%
	Phase II Regional Centers	38239	7648	5877	77%	15%
	Phase III NYC	532511	106502	64063	60%	12%
	Vet Phase 1 - Center at Homelake	13589	2718	3674	135%	27%
Dept. of Military & Veterans Affairs		6416.5	1283	120	9%	2%
Dept. of Personnel & Administration		84482	16896	1769	10%	2%
	Phase II	84482	16896	1769	10%	2%
Dept of Public Health & Environment		7849	1570	1305	83%	17%

* This project is to use raw rather than treated water for irrigation and results have not yet occurred.

Paper Use Reduction - 20% Goal

Paper

The State Purchasing Office has state price agreements with vendors for paper purchases, including the purchase of paper with recycled content. These vendors report the dollar value of purchases of paper but currently are unable to provide accurate paper quantity reporting. Data which reflects paper usage or consumption is not available statewide. As a result of a strong push for compliance with these mandatory state price agreements that started in 2007, reports of the number of paper purchases using the vendor price agreements have dramatically increased. Vendors report that since FY2006 the state experienced overall flat purchases in paper use through FY2009; and the percentage of paper with recycled content the state purchased increased more than 20% during the same time period. The Greening Government Council working with the State Purchasing Office will continue to explore different metrics that will better address paper usage in State government.

Although efforts to track paper consumption are occurring on a statewide level using the state price agreements, some agencies have internal systems to track their own consumption.

The Department of Local Affairs reduced paper use by 15.4% in FY2009 vs. FY2005. The following shows reams of paper ordered per division between FY2005 and FY2009:

Agency	FY 2005	FY2006	FY 2007	FY 2008	FY2009	FY 2010- up to current invoices
Executive Director's Office	100	143	170	320	312	100
Div. Property Taxation	696	649	735	498	367	209
Div. Housing	449	473	548	465	300	64
Div. Local Gov't & Field Staff	486	552	644	572	315	170
Div. Emergency Mgmt.	206	335	365	377	153	114
Board of Assessment Appeals	80	100	100	200	260	
Yearly totals:	2017	2252	2562	2432	1707	657

The Colorado Department of Public Health and Environment used its Paper Reduction Strategy, implemented in 2004, to reduce the number of cases of paper it uses. The 3810 cases of paper used in baseline year FY2005 were reduced to 966 in FY2009 by using duplex printing, limiting copier use and making efforts at becoming a paperless office.

The Division of Wildlife implemented electronic procedures to replace some internal paper communications and external special licensing applications. This reduced the number of pages printed from 34,302 in 2006 to 7,440 in 2009.

The Colorado Water Conservation Board uses electronic imaging and email transmittals rather than hard copy mailings for its records management, reducing its paper consumption by 68% since FY2005.

The Division of Water Resources uses electronic means to communicate with its customers, uploads records and documents for internet viewing, and as a result reduced its paper consumption by 29% since FY2005.

Environmentally Preferable Purchasing

The Environmentally Preferable Purchasing (EPP) policy was introduced in 2009. This new policy provides guidance for the environmentally preferable standards and attributes which can be incorporated into the solicitations by state agencies. Major strategies for state agency purchases include: source reduction- (reducing waste); reduction of toxic elements, energy, emissions, and pollution; recycled content products; and energy and water saving products (e.g., the EPA ENERGY STAR® certification or similar). The policy also takes into consideration the “life cycle costs” of the product (such as raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, disposal, energy efficiency, product performance, durability, safety, needs of the purchaser, and cost). The Department of Personnel and Administration, State Purchasing Office (SPO) is responsible for maintenance and oversight of the EPP policy. The document can be viewed on the State Purchasing Office and GEO websites.

Material Use Reductions - Zero Waste Goal

A “zero waste” goal from construction of new buildings and operation and renovation of existing facilities is currently an accepted agency culture where applicable. During the first floor modernization at the Department of Health Care Policy and Financing facility at 1570 Grant Street, green construction practices were used whenever possible including using low VOC paint, using an existing carpet remnant instead of new carpet, and salvaging materials as much as possible. This agency recently performed some work that included obtaining 52 refurbished/remanufactured office cubicles at a fraction of the cost of new cubicles.

Recycling in state offices is commonplace and very effective at reducing waste sent to landfills. The Department of Public Health and Environment (CDPHE) has made composting options available at 75% of the buildings it operates. Waste audits – to identify waste streams and help target recycling solutions – have been done at several agencies including CDPHE. Quantifiable results for the recycling programs used for Capitol Complex facilities are presented below.

Recycling Results, Capitol Complex Buildings, FY2009

	2008	2008	2008	2008	2008	2008	2009	2009	2009	2009	2009	2009	Bldg Totals	
Location / Address	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June		
1313 Sherman	4,960	3,340	4,680	4,400	2,200	5,440	6,560	7,400	6,840	8,440	6,860	6,280	67,400	DNR,DOLA, DPA
1375 Sherman	8,660	3,680	5,200	6,020	4,040	5,420	5,980	6,600	8,060	5,700	4,060	6,050	69,470	DOR
700 Kipling	1,920	2,440	1,760	1,840	1,120	1,540	1,120	1,120	1,780	2,305	2,060	1,140	20,145	AG, CDPS
1881 Pierce	7,955	1,000	960	935	900	900	340	680	500	800	920	660	16,550	DOR
1313 Sherman, # 319	0	0	0	0	0	0	0	0	0	0	0	0	0	DPA
1575 Sherman	2,360	6,180	5,800	6,160	1,860	4,500	3,920	2,760	2,240	1,660	1,860	3,380	42,680	Human Services
1570 Grant	1,765	1,860	2,140	1,520	540	1,500	440	760	960	3,720	1,640	2,460	19,305	HCPF
400 E. 8th Avenue	0	0	0	0	0	0	0	0	0	0	0	0	0	Governors Residence
1001 E. 62nd Avenue	4,420	3,240	5,160	3,570	3,340	3,500	2,780	2,075	1,380	1,480	2,700	2,660	36,305	North Campus
690 Kipling	1,260	1,620	840	1,420	1,040	1,080	1,005	1,740	1,620	4,495	1,120	1,000	18,240	OIT, CDPS
690 Kipling (doc)	0	0	0	0	0	0	0	0	0	0	0	0	0	OIT, CDPS
200 E. Colfax	0	5,340	5,245	3,040	3,780	9,900	14,240	3,900	6,910	6,040	19,885	4,040	82,320	State Capitol
251 E. 12th Avenue	3,720	3,340	1,800	3,480	1,720	3,140	1,820	3,440	2,465	2,500	3,420	3,540	34,385	CDLE
200 E. Colfax, #140	0	0	0	0	0	0	0	0	0	0	0	0	0	State Capitol
1525 Sherman	7,480	4,000	13,645	9,225	4,630	3,180	3,280	3,080	3,380	3,520	3,160	3,595	62,175	Dept of Law
1525 Sherman	0	0	0	0	0	0	0	0	0	0	0	0	0	Dept of Law
200 E. 14th Avenue	0	820	1,010	540	0	1,880	0	380	3,060	1,100	1,540	0	10,330	Legislative Services build
201 E. Colfax	4,240	2,960	3,520	6,085	2,360	1,120	1,980	1,975	1,540	1,480	1,020	1,640	29,920	Education
15203 W. 12th Ave. CGW	760	1,860	880	880	1,080	980	1,825	1,200	1,280	300	420	2,000	13,465	Camp George West
Monthly Totals (lbs)	49,500	41,680	52,640	49,115	28,610	44,080	45,290	37,110	42,015	43,540	50,665	38,445	265,625	
Monthly Totals (tons)	24.75	20.84	26.32	24.56	14.31	22.04	22.65	18.56	21.01	21.77	25.33	19.22	132.81	

Although many good recycling programs exist throughout the state, systems for accurate tracking and reporting are needed to assure this progress continues in a sustainable manner.

Recommendations from the Greening Government Council

- Standardize the agency use of EnergyCAP software for energy and water consumption reduction tracking. Appropriate past data from decentralized systems should be incorporated into this single system.
- Efforts should continue to measure accurately results of Energy Performance Contracting and to champion the issuance of Qualified Energy Conservation Bonds. These programs are expected to be important components in reaching the goals; however, a reasonable period of time will be required for the effects of their implementation to be recognized. The database to track these results exists and is well-designed but is now too new to provide consistent results.
- Development of third-party Power Purchase Agreements for solar energy projects that are transferrable to other state agencies should be strongly encouraged.
- Budget considerations may hinder efforts to achieve the greening government goals, particularly those related to petroleum use. The recently approved vehicle replacement plan for FY2010 that will allow for 625 replacements, 194 of which are hybrids and 268 Flex-Fueled Vehicles, will be critically needed to help meet the petroleum use reduction goal. Additional similar vehicle replacements also may be needed in FY2011 and FY 2012 to meet Greening Government goals.