

ESTIMATED ENERGY PERFORMANCE IMPROVEMENTS



		LOW	HIGH	LOW	HIGH	COST	ANNUAL SAVINGS	PAYBACK	ASSET VALUE INCREASE	ROI
OPERATIONS AND MAINTENANCE										
	Functioning as Designed									
	Regularly inspect all equipment and controls to ensure they are functioning as designed.	1.9%	7.7%	\$ 2,793	\$ 11,077					
	CASE: Located and corrected chilled water pump control issue					\$ 1,200	\$ 43,000	7 Days	\$ 537,500	3583.0%
	Calibrate Thermostats									
	Periodically walk through the building and compare the thermostat setting with a hand held thermometer.	0.4%	1.9%	\$ 578	\$ 2,793					
	Adjust Dampers									
Bring in the least amount of outside air necessary to maintain proper air quality.	1.9%	3.8%	\$ 2,793	\$ 5,490						
Janitorial Best Practices										
Team cleaning - clean one floor at a time; Coordinate cleaning & security staff; Clean during work hours.	0.4%	5.3%	\$ 578	\$ 7,706						
CASE: Instituted daytime janitorial hours from 11AM - 8PM.					\$ -	\$ 100,000	Immed.	\$ 1,250,000	NA	
CASE: Corrected air flow direction and relocated air flow sensors.					\$ 4,500	\$ 30,995	53 Days	\$ 387,438	689.0%	
SUBTOTALS, OPERATIONS AND MAINTENANCE				\$ 6,742	\$ 27,066					

ESTIMATED ENERGY PERFORMANCE IMPROVEMENTS



	LOW	HIGH	LOW	HIGH	COST	ANNUAL SAVINGS	PAYBACK	ASSET VALUE INCREASE	ROI
OCCUPANTS BEHAVIOR									
Turn off Equipment During off hours, make sure to power down all equipment and lights.	0.4%	3.5%	\$ 578	\$ 5,009					
Institute an Energy Awareness Program Link to national campaigns; Company newsletters; Fact sheets; Other publicity	0.3%	1.1%	\$ 385	\$ 1,637					
Use Energy Star Equipment Adopt a procurement policy as part of your overall energy management strategy.	0.4%	1.3%	\$ 578	\$ 1,830					
Install Monitor Power Management Software Monitor power management - up to \$55 annually; CPU/Hard drive management - up to \$45 annually.	0.7%	2.0%	\$ 1,060	\$ 2,890					
harvest Daylight Locate work stations requiring high illumination adjacent to windows.	0.2%	1.3%	\$ 289	\$ 1,830					
Use Work Station Task Lighting Direct light at areas where tasks are being performed and use lower overhead wattage.	0.3%	0.9%	\$ 482	\$ 1,348					
SUBTOTALS, OCCUPANTS BEHAVIOR			\$ 3,371	\$ 14,544					

ESTIMATED ENERGY PERFORMANCE IMPROVEMENTS



	LOW	HIGH	LOW	HIGH	COST	ANNUAL SAVINGS	PAYBACK	ASSET VALUE INCREASE	ROI
LIGHTING									
Change Incandescents to CFL & HID									
Change to more efficient lamps.	0.4%	3.5%	\$ 578	\$ 5,009					
CASE: Garage lighting retrofit.					\$ 117,217	\$ 138,544	10 Months	NA	118.0%
CASE: Corrected air flow direction and relocated air flow sensors.					\$ 51,053	\$ 62,936	10 Months	NA	123.0%
Convert T12 to T8 and T5									
Convert to T8s and T5s and replace magnetic ballasts with electronic ballasts.	2.3%	6.5%	\$ 3,371	\$ 9,343					
Delamp									
Delamp and disconnect unused ballasts. Reduce lighting levels.	2.2%	3.3%	\$ 3,179	\$ 4,816					
CASE: Delamped wherever possible.					\$ 11,088	\$ 105,059	1 Month	NA	948.0%
Full Floor Lighting Sweeps									
Program and periodically verify that the EMS system is performing full floor lighting sweeps.	0.3%	0.9%	\$ 482	\$ 1,348					
Occupancy Sensors									
Install occupancy sensors to automatically turn off lights when physical movement stops.	0.2%	2.1%	\$ 289	\$ 3,082					
CASE: Insalled motion sensors in storerooms.					\$ 9,324	\$ 5,800	1.6 Years	NA	57.0%
CASE: Adjusted motion sensors from 18 minutes to 5-7 minutes.					\$ 2,750	\$ 750	3.7 Years	NA	27.0%
High Efficiency LED Exit Signs									
Lower maintenance costs due to extended life.	0.1%	0.2%	\$ 193	\$ 289					
Timer Controls & Photocells for Exterior Lighting									
Automatically control lights in response to daylight. Install timer controls for exterior lights.	0.5%	1.9%	\$ 674	\$ 2,793					
CASE: Installed photocells for exterior lighting.					\$ 1,900	\$ 700	2.7 Years	NA	37.0%
SUBTOTAL, LIGHTING			\$ 8,765	\$ 26,681					

ESTIMATED ENERGY PERFORMANCE IMPROVEMENTS



		LOW	HIGH	LOW	HIGH	COST	ANNUAL SAVINGS	PAYBACK	ASSET VALUE INCREASE	ROI
CONTROLS										
Adjust Temperature	Walk through building and talk with tenants to determine if temperature is comfortable.	0.7%	1.9%	\$ 1,060	\$ 2,793					
After Hours Usage	Talk to tenants to see if they are using their space during the lease required operating hours.	0.5%	1.0%	\$ 674	\$ 1,445					
Adjust Ventilation	Adjust ventilation in low or unoccupied spaces. Reduce exhaust & outdoor-air ventilation rates.	1.9%	3.8%	\$ 2,793	\$ 5,490					
Limit Access to Thermostats	Project thermostats from unauthorized adjustment. Use tamper-proof locking covers.	0.2%	0.9%	\$ 289	\$ 1,252					
Seasonal Changes	Revisit temperature set point. Lower set point in the winter; Higher set point in the summer.	0.7%	3.8%	\$ 1,060	\$ 5,490					
Optimize Start Up Time and Equipment Sequencing	Experiment to determine the latest possible start up time, and still achieve desired temperature. CASE: Changed cooling tower staging and sequencing,.	0.4%	1.9%	\$ 578	\$ 2,793	\$ 575	\$ 12,272	17 Days	NA	2134.0%
Coast Last Hour of Operations	Experiment to determine the earliest time the systems can be powerd down, CASE: Reduced operating hours on a fountain from 119 to 60 hrs/week.	0.4%	1.9%	\$ 578	\$ 2,793	\$ -	\$ 6,706	Immed.	NA	NA
SUBTOTAL, CONTROLS				\$ 7,031	\$ 22,057					

ESTIMATED ENERGY PERFORMANCE IMPROVEMENTS



	LOW	HIGH	LOW	HIGH	COST	ANNUAL SAVINGS	PAYBACK	ASSET VALUE INCREASE	ROI
EQUIPMENT									
Install VFD & VAV Air handling and distribution is the most prevalent deficiency in office buildings. CASE: Install VFDs	1.0%	6.2%	\$ 1,445	\$ 8,958	\$ 31,000	\$ 16,000	2 years	NA	52.0%
Install Heat Recovery Equipment Install heat recovery equipment (enthalpy wheels, heat pipes) to optimize conditioning of ventilated air.	1.1%	3.5%	\$ 1,637	\$ 5,009					
Relocate Thermostats to Optimal Locations Install or relocate thermostats near return air ducts. CASE: Relocate thermostats	0.2%	0.9%	\$ 289	\$ 1,348	\$ 3,230	\$ 2,519	1.3 Years	NA	78.0%
SUBTOTAL, EQUIPMENT			\$ 3,371	\$ 15,315					

EPA BEST PRACTICES TO IMPROVE ENERGY PERFORMANCE IN COMMERCIAL BUILDINGS



	50.0%		Adjusted		50% Savings		Adjusted	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
OPERATIONS AND MAINTENANCE								
Functioning as Designed								
Regularly inspect all equipment and controls to ensure they are functioning as designed.	2.9%	11.5%	1.9%	7.7%	\$ 6,285	\$ 23,839	\$ 2,793	\$ 11,077
CASE: Located and corrected chilled water pump control issue								
Calibrate Thermostats								
Periodically walk through the building and compare the thermostat setting with a hand held thermometer.	0.6%	2.9%	0.4%	1.9%	\$ 1,300	\$ 6,285	\$ 578	\$ 2,793
Adjust Dampers								
Bring in the least amount of outside air necessary to maintain proper air quality.	2.9%	5.7%	1.9%	3.8%	\$ 6,285	\$ 12,353	\$ 2,793	\$ 5,490
Janitorial Best Practices								
Team cleaning - clean one floor at a time; Coordinate cleaning & security staff; Clean during work hours.	0.6%	8.0%	0.4%	5.3%	\$ 1,322	\$ 17,338	\$ 578	\$ 7,706
CASE: Instituted daytime janitorial hours from 11AM - 8PM.								
CASE: Corrected air flow direction and relocated air flow sensors.								
SUBTOTALS, OPERATIONS AND MAINTENANCE					\$ 15,192	\$ 59,815		

EPA BEST PRACTICES TO IMPROVE ENERGY PERFORMANCE IN COMMERCIAL BUILDINGS



		50.0%		Adjusted		50% Savings		Adjusted	
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
OCCUPANTS BEHAVIOR									
	Turn off Equipment During off hours, make sure to power down all equipment and lights.	0.6%	5.2%	0.4%	3.5%	\$ 1,322	\$ 11,486	\$ 578	\$ 5,009
	Institute an Energy Awareness Program Link to national campaigns; Company newsletters; Fact sheets; Other publicity	0.4%	1.7%	0.3%	1.1%	\$ 759	\$ 3,684	\$ 385	\$ 1,637
	Use Energy Star Equipment Adopt a procurement policy as part of your overall energy management strategy.	0.6%	1.9%	0.4%	1.3%	\$ 1,300	\$ 4,118	\$ 578	\$ 1,830
	Install Monitor Power Management Software Monitor power management - up to \$55 annually; CPU/Hard drive management - up to \$45 annually.	1.1%	3.0%	0.7%	2.0%	\$ 2,384	\$ 6,502	\$ 1,060	\$ 2,890
	harvest Daylight Locate work stations requiring high illumination adjacent to windows.	0.3%	1.9%	0.2%	1.3%	\$ 650	\$ 4,009	\$ 289	\$ 1,830
	Use Work Station Task Lighting Direct light at areas where tasks are being performed and use lower overhead wattage.	0.5%	1.4%	0.3%	0.9%	\$ 997	\$ 3,034	\$ 482	\$ 1,348
SUBTOTALS, OCCUPANTS BEHAVIOR						\$ 7,412	\$ 32,833		

EPA BEST PRACTICES TO IMPROVE ENERGY PERFORMANCE IN COMMERCIAL BUILDINGS



		50.0%		Adjusted		50% Savings		Adjusted	
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
LIGHTING									
Change Incandescents to CFL & HID									
	Change to more efficient lamps.	0.6%	5.2%	0.4%	3.5%	\$ 1,300	\$ 2,601	\$ 578	\$ 5,009
	CASE: Garage lighting retrofit.								
	CASE: Corrected air flow direction and relocated air flow sensors.								
Convert T12 to T8 and T5									
	Convert to T8s and T5s and replace magnetic ballasts with electronic ballasts.	3.5%	9.7%	2.3%	6.5%	\$ 7,585	\$ 21,022	\$ 3,371	\$ 9,343
Delamp									
	Delamp and disconnect unused ballasts. Reduce lighting levels.	3.3%	5.0%	2.2%	3.3%	\$ 7,152	\$ 10,836	\$ 3,179	\$ 4,816
	CASE: Delamped wherever possible.								
Full Floor Lighting Sweeps									
	Program and periodically verify that the EMS system is performing full floor lighting sweeps.	0.5%	1.4%	0.3%	0.9%	\$ 997	\$ 3,034	\$ 482	\$ 1,348
Occupancy Sensors									
	Install occupancy sensors to automatically turn off lights when physical movement stops.	0.3%	3.2%	0.2%	2.1%	\$ 672	\$ 6,935	\$ 289	\$ 3,082
	CASE: Installed motion sensors in storerooms.								
	CASE: Adjusted motion sensors from 18 minutes to 5-7 minutes.								
High Efficiency LED Exit Signs									
	Lower maintenance costs due to extended life.	0.2%	0.3%	0.1%	0.2%	\$ 325	\$ 607	\$ 193	\$ 289
Timer Controls & Photocells for Exterior Lighting									
	Automatically control lights in response to daylight. Install timer controls for exterior lights.	0.7%	2.9%	0.5%	1.9%	\$ 1,582	\$ 6,285	\$ 674	\$ 2,793
	CASE: Installed photocells for exterior lighting.								
SUBTOTAL, LIGHTING						\$ 19,613	\$ 51,320		

EPA BEST PRACTICES TO IMPROVE ENERGY PERFORMANCE IN COMMERCIAL BUILDINGS



		50.0%		Adjusted		50% Savings		Adjusted	
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
CONTROLS									
Adjust Temperature	Walk through building and talk with tenants to determine if temperature is comfortable.	1.1%	2.9%	0.7%	1.9%	\$ 2,384	\$ 6,285	\$ 1,060	\$ 2,793
After Hours Usage	Talk to tenants to see if they are using their space during the lease required operating hours.	0.7%	1.5%	0.5%	1.0%	\$ 1,517	\$ 3,251	\$ 674	\$ 1,445
Adjust Ventilation	Adjust ventilation in low or unoccupied spaces. Reduce exhaust & outdoor-air ventilation rates.	2.9%	5.7%	1.9%	3.8%	\$ 6,285	\$ 12,353	\$ 2,793	\$ 5,490
Limit Access to Thermostats	Project thermostats from unauthorized adjustment. Use tamper-proof locking covers.	0.3%	1.3%	0.2%	0.9%	\$ 563	\$ 2,817	\$ 289	\$ 1,252
Seasonal Changes	Revisit temperature set point. Lower set point in the winter; Higher set point in the summer.	1.1%	5.7%	0.7%	3.8%	\$ 2,384	\$ 12,353	\$ 1,060	\$ 5,490
Optimize Start Up Time and Equipment Sequencing	Experiment to determine the latest possible start up time, and still achieve desired temperature. CASE: Changed cooling tower staging and sequencing,.	0.6%	2.9%	0.4%	1.9%	\$ 1,300	\$ 6,285	\$ 578	\$ 2,793
Coast Last Hour of Operations	Experiment to determine the earliest time the systems can be powered down, CASE: Reduced operating hours on a fountain from 119 to 60 hrs/week.	0.6%	2.9%	0.4%	1.9%	\$ 1,300	\$ 6,285	\$ 578	\$ 2,793
SUBTOTAL, CONTROLS						\$ 15,733	\$ 49,629		

EPA BEST PRACTICES TO IMPROVE ENERGY PERFORMANCE IN COMMERCIAL BUILDINGS



		50.0%		Adjusted		50% Savings		Adjusted	
		LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
EQUIPMENT									
	Install VFD & VAV Air handling and distribution is the most prevalent deficiency in office buildings. CASE: Install VFDs	1.5%	9.3%	1.0%	6.2%	\$ 3,251	\$ 20,155	\$ 1,445	\$ 8,958
	Install Heat Recovery Equipment Install heat recovery equipment (enthalpy wheels, heat pipes) to optimize conditioning of ventilated air.	1.7%	5.2%	1.1%	3.5%	\$ 3,684	\$ 11,269	\$ 1,637	\$ 5,009
	Relocate Thermostats to Optimal Locations Install or relocate thermostats near return air ducts. CASE: Relocate thermostats	0.3%	1.4%	0.2%	0.9%	\$ 650	\$ 3,034	\$ 289	\$ 1,348
SUBTOTAL, EQUIPMENT						\$ 7,585	\$ 34,458		

EPA Percentile: 75 kWh/sq. ft. @ 50 Percentile: 24.08
 Savings Adjustment Factor: 0.666667 Usage Adjustment Factor: 66.67%
 Square feet: 100000
 kWh costs: 0.09
 Estimated energy bill: 144480