



Cathedral City Energy Action Plan

May 2013



2013 Energy Action Plan



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This program is funded by California utility ratepayers and administered by Southern California Edison under the auspices of the California Public Utilities Commission

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Acknowledgements for Assistance

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I. Executive Summary

An Energy Action Plan is a living document. It is meant to change with time, experience and need. Its purpose is to identify opportunities for cost savings through energy efficiency and actions necessary to meet the City's future energy needs, consistent with energy policies set forth by the State of California.



This Energy Action Plan has been funded by Southern California Edison under the auspices of the California Public Utilities Commission.

Background

Cathedral City has an impressive history of energy management and sustainability, being recognized as a leader in the Coachella Valley and in the Desert Cities Energy Partnership, and demonstrating its prowess through a major solar installation and a comprehensive energy savings performance contract.

Cathedral City has worked in partnerships and has successfully “moved the ball forward” in terms of its own wise energy use and its community’s energy efficiency, despite challenging economic times and demographics. By the first quarter of 2012, and thanks to the initiatives listed below, Cathedral City had achieved 23% savings in municipal facilities since 2004, well beyond the 10% commitment made in 2008, and 11% savings community-wide.

Past and Current Initiatives

- Community Energy Partnership
- Honeywell Energy Performance Contract
- Award-Winning Recycling Programs
- Desert Cities Energy Partnership
- Energy Efficiency & Conservation Block Grant-Funded Projects
- Green for Life Facilities and Climate Action Initiative

Looking Forward

Given challenging economic factors, the City has to maintain an opportunistic posture, drawing from federal, state, and regional grants, utility incentives, foundation support, and other funding sources to support smart energy investments. The City has been keeping a close eye on emerging technologies that offer pragmatic and proven solutions. In every case, the goal is to take action that is cost-effective and provides economic and environmental benefits to the City, its residents, and the region.

This Energy Action Plan provides a roadmap of actions within the City’s municipal operations, to help reduce energy consumption, to reduce operating costs, and increase energy awareness.

The Energy Action Plan presents a detailed breakdown of municipal energy use in Cathedral City, and then provides a series of energy-related goals for the coming years through 2015 and beyond. The goals focus on these areas: retrofit and expansion of municipal facilities, upgrading the municipal fleet, and consideration of municipal programs and actions that will help reduce municipal and community-wide energy use, and greenhouse gas (GHG) emissions. The final section of the plan focuses on action steps that are a distillation of an energy action planning process. What can be done in Cathedral City to cut energy costs? How can the City continue to lead by example? How can it attain the Southern California Edison Platinum Partner status in the Energy Leader Partnership? How can an infrastructure of EV charging and CNG refueling be developed at minimal cost to the City? Goals are matched with options and implementation strategies.

This 2013 Energy Action Plan provides a basis for continued discussion and a guide for ongoing retrofit results and Council decision-making. Capital expenditures must be minimized, staff will continue to track opportunities, partnerships fostered, and the community will be encouraged to recognize that returns on energy efficiency upgrades are often far better than other investments. In the meantime, efficiency upgrades result in environmental benefits, as well as basic creature comfort benefits, like better lighting and more comfortable offices.

Cathedral City's 2013 Greenhouse Gas Inventory¹ and its greenhouse gas reduction plan, Cathedral City's 2013 Climate Action Plan² complement the energy-saving strategies in this Energy Action Plan and factor emissions reduction opportunities into a more comprehensive analysis. Together, these documents provide a sustainability roadmap that supports the City's goals for community benefits, economic viability, and environmental stewardship.

Summary Data

Each year, Cathedral City spends well over a million dollars for energy: a total of \$1,377,306 in 2010 for fleet fuels (\$772,951), electricity (\$598,311), and natural gas (\$6,044).

Cathedral City spends ~\$1.3 million on energy each year for municipal operations.

This combined value stands as a reminder to the City of the potential to cut energy costs, and to thus be able to reallocate City resources to pressing needs of job retention, economic development, continued public safety, and other lifeline services. Energy savings can also be reinvested in future energy retrofits to generate additional energy savings and the associated greenhouse gas (GHG) reduction.

The largest energy expense is for fuels for the City's fleets, nearly \$800,000 a year.

¹ Cathedral City 2013 Greenhouse Gas Inventory, Community and Municipal Operations Inventories, 2010 Baseline Year, Prepared by EcoMotion for Cathedral City and the Coachella Valley Association of Governments, May 2013 .

² Cathedral City 2013 Climate Action Plan: Leadership in Energy Efficiency, Prepared by EcoMotion for Cathedral City and the Coachella Valley Association of Governments, May 2013).

In February of 2012, EcoMotion conducted “walk-through assessments” for all municipal facilities in Cathedral City to identify opportunities for energy efficiency. The assessments revealed a number of energy efficiency measures and potential retrofits for City consideration. The 24 measures presented in this Plan have an estimated energy-savings value of 188,157 kWh, three times the savings required to fill the 65,482 kWh “gap” to achieve the City’s 25% goal, and to fulfill the 66,500 kWh necessary to meet Southern California Edison’s 2013 energy efficiency requirement for the Platinum level in the Energy Leader Partnership.

II. Introduction

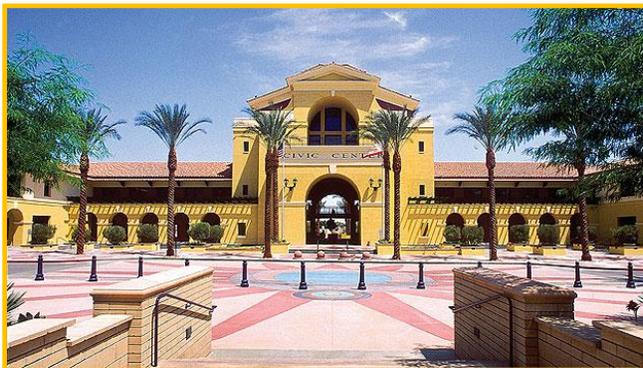
Cathedral City is a business and resort community located in the Coachella Valley in eastern Riverside County. The City is bordered on the west by the City of Palm Springs and on the east by the City of Rancho Mirage. The City currently includes 21.8 square miles of land, extending from the Santa Rosa Mountains on the south to Edom Hill on the north.

Based on the 2010 Census, Cathedral City has a population of 51,200, living in 21,527 housing units. The climate and leisure activities attract an additional 10,000 residents during the winter months. The population is 55% Hispanic, 38% White, and less than 7% African American, Asian, and other.

Of the City's total 13,921 acres, the Agua Caliente Band of Cahuilla Indians' land constitutes 3,659 acres, or 26% of the total City acreage. When only built-out parcels are examined – defined as having a structure on the parcel, or a structural value assessed on the tax roll, or other developments including parks, golf courses, wind farms, etc. – the total “built-out” area is 5,509 acres. Of this, the reservation land is 1,872 acres, and 34% of the total.

Cathedral City is governed by five council members including a Mayor and Mayor Pro Tem. With approximately 200 city employees, Cathedral City provides facilities and services such as animal control, building and safety, business resources, engineering, finance, fire, housing, libraries, information technology, parks, planning, police, recycling, trash, energy programs, traffic and utilities.

Cathedral City has made it a commitment to preserve the important environmental and cultural assets of the community in its General Plan. Participating in the Green for Life program is a major, recent expression of this commitment. The Green for Life program re-examines



municipal facilities and their management, and benchmarks greenhouse gasses to create both climate and energy action plans to help the City save valuable resources. The Energy Action Plan compliments the 2013 Cathedral City Climate Action Plan, serving as its municipal sector guide to energy savings and compliance. Together, these plans will be referenced in the City's General Plan when it is updated.

The context for the 2013 Energy Action Plan is clear: The City was already facing severe economic challenges prior to the recession. The community has no particular industry; both Sam's Club and Wal-Mart left town. Then recession depressed property values and decreased City revenues. The City has had to cut staff – a 20% reduction in City Hall alone. The loss of Redevelopment Agency funding has also resulted in staff size reduction. Given this financial predicament, energy actions must help cut costs and provide immediate benefit as investments for the future are generally infeasible at this time.

III. A Track Record of Energy Action in Cathedral City

Cathedral City has a decade-long track record of smart energy management, getting its “own house in order,” while promoting environmental conservation and stewardship throughout the City’s residential communities and commercial activities. Success in this ambitious endeavor now ranges from the energy-conscious Civic Center to Cathedral City High School’s Health and Environmental Academy of Learning (HEAL) program that teaches youth about sustainability and smart energy management, to the Dream Homes community that has been the focus of several energy partnerships including the recent, no-cost installation of 20 photovoltaic systems provided by Grid Alternatives.

The City’s commitment to sustainability and energy action was formally cemented in 2000 when the City hired a professional whose focus was on energy. She has been responsible for implementing the programs detailed below.

Cathedral City also demonstrated leadership by passing a resolution in 2007 declaring support for the California Green Builder Program. It participated in innovative efficiency partnerships with Southern California Edison and Southern California Gas Company -- the Community Energy Partnership and the current Desert Cities Energy Partnership and it’s Green for Life suite of services.

Cathedral City’s most definitive statement about municipal energy use and commitment to cutting energy costs was made in 2004 when a seven-year performance based contract was signed with Honeywell. Through this contract, a 226 kW solar system was installed and comprehensive efficiency measures were put in place in City facilities to cut the City’s power and gas bills. The solar system alone cut the City’s external power requirement by over 10%.

Community Action through Partnerships

Community Energy Partnership

Starting in 2004, Cathedral City partnered for four years with The Energy Coalition, Southern California Edison, and Southern California Gas Company to deliver an energy efficiency program known as the Community Energy Partnership. It targeted a number of energy reduction strategies and gave particular focus to low-income residents.

A demonstration project in the low-income “Dream Homes” community in 2005 was heralded for its innovation. The project began with outreach through the schools, and included door-to-door information delivery by English and Spanish speaking advocates. A City flatbed truck was used to distribute hundreds of energy-efficient fans to residents, providing awareness and comfort while keeping thermostats set high.

Community programs in partnership with The Energy Coalition in 2007 and 2008 included activities such as home building envelope tune-ups, halogen torchiere exchanges, and CFL giveaways; the results were 1,052,604 annual kWh savings and 13,243 annual therm savings.

Federal Stimulus Funding

The City's most recent facility upgrades were done in 2011 using federal stimulus money, Energy Efficiency and Conservation Block Grant (EECBG) funds. Using federal stimulus funds allocated by the California Energy Commission, Cathedral City implemented four projects: Civic Center HVAC and lighting retrofits, police station upgrades, and computer server virtualization. These projects result in 230,383 kWh of annual savings and an additional 7% savings from the 2004 baseline year for municipal facilities, bringing the cumulative total to 23%.

CIVIC CENTER
Energy Use
Reduced
by 7%

At the Civic Center, efficiency is on display: HVAC units are programmed according to occupancy use, reducing air conditioning and heating needs. City buildings utilize efficient fluorescent lighting, occupancy sensors, and reflective window film to reduce overall energy needs and to provide a safe environment for all employees. The City's four-day work week helps lower commuting time and emissions, while saving energy as a spin-off benefit.

The City's fleet of 143 vehicles has also been the focus of upgrades: More than 80% of the City's non-emergency fleet vehicles utilize alternative fuels either through the use of compressed natural gas or hybrid technologies. Cathedral City owns and operates 22 alternative fueled vehicles. For every gasoline gallon equivalent (GGE) of CNG that is used, the City saves an average of \$1.25 (based on average gasoline costs) – representing over \$80,000 a year.

Honeywell Energy Services Contract

In 2004, Cathedral City awarded a municipal energy services contract to Honeywell. Included were solar energy and conservation measures to be applied to a number of facilities including the Civic Center, three Fire Stations, Public Works facilities, as well as traffic signals.

Civic Center

- **Solar:** A 226 kW photovoltaic system was placed upon shade/carport structures erected on the Civic Center parking structure roof deck. The existing light poles were removed and replaced with efficient T8 lighting under the canopy construction. Trenching was done to shunt power from the parking structure to the northeast corner of City Hall for interconnect.
- **Lighting:** Honeywell replaced the existing T12 fluorescent lamps and ballasts with energy-efficient T8 lamps and electronic ballasts. Incandescent lamps were exchanged for compact fluorescent lamps. A number of exit signs were replaced with LED versions. These upgrades resulted in a collateral impact of reducing heat gain known as the "HVAC bonus." Lighting system advances cut power for this end use by 44%.

Lighting
Retrofits
cut energy use by
44%

- **Reflective Film:** Reflective window film was added to the south facing windows on the first and second floors of the Civic Center. The film reduces glare and screens out heat which reduces air conditioning loads.
- **Workplace Occupancy Controls:** Surge protectors with motion detectors were supplied to 38 workspaces. This allowed lighting energy to be reduced as well as depressing plug load.

In addition to the Civic Center, work was done in other facilities. Three fire stations as well as the public works facilities underwent lighting retrofits and added occupancy controls.

Traffic System

Incandescent lamps in traffic signals and pedestrian crossing signals were replaced with LED

86% energy savings from LED Traffic Lights

technology. Over 1,300 individual lamps were exchanged. In addition to 86% energy savings, the traffic signals are brighter and the LED system has lowered maintenance costs.

Cathedral City is to be credited for forging a win-win arrangement to secure savings: The performance-based contract stipulates that if the measures do not result in the specified level of savings (\$120,000 for each of seven years), Honeywell will be responsible to pay any shortfall. The savings are occupancy and weather adjusted per contract terms, and Honeywell has indeed had to pay “cost adjustments” to the City.

One of the challenges in such contracts is determining the value of power saved, and in the case of solar, the amount and value of solar generated. The Honeywell contract stipulates a blended rate for power of 13.3 cents per kilowatt-hour as the basis for energy savings. This rate is escalated each year of the seven-year term. While certain aspects of the contract may have not met expectations, the City is to be applauded for engaging in such an innovative contract and getting major energy management actions accomplished.

Performance Contract Benefit

The Honeywell performance-based contract has provided the City with major benefits, from making a highly visible statement, to making lighting more efficient and visible, to saving significant amounts of money in the process. Each year the project’s “Energy Guarantee Special Provision” assures that the City will save \$120,795.

As Table 1 shows, and largely due to less output from the solar system than anticipated, the savings have been short of projections. However, rather than be a loss to the City, thanks to the City’s negotiations, Honeywell has had to honor its guarantee and write a shortfall check. The most recent cost adjustment was for \$4,576.

Table 1: Honeywell Performance-Based Savings Analysis

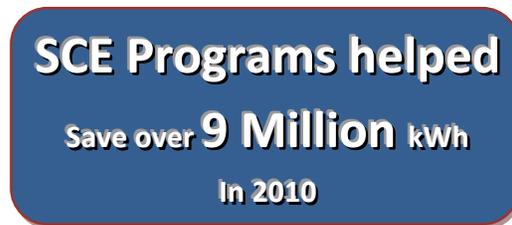
	2005 – 06	2006 - 07	2007 - 08	2008 - 09	2009 - 10
Honeywell Solar and Energy Efficiency Measures	Year 1 Savings	Year 2 Savings	Year 3 Savings	Year 4 Savings	Year 5 Savings
Civic Center	\$58,129	\$46,463	\$55,807	\$55,743	\$57,918
Public Works	\$3,446	\$3,446	\$3,446	\$3,446	\$3,446
Fire Station #411	\$479	\$479	\$479	\$479	\$479
Fire Station #412	\$2,167	\$2,167	\$2,167	\$2,167	\$2,167
Fire Station #413	\$1,152	\$1,152	\$1,152	\$1,152	\$1,152
Traffic Light System	\$51,056	\$51,056	\$51,056	\$51,056	\$51,056
Totals	\$116,429	\$104,764	\$114,107	\$114,043	\$116,219

Coachella Valley Energy Conservation Initiative

In 2008 and by Resolution # 2008-07, and given the region’s abundant sunshine, wind, and geothermal energy, Cathedral City joined the Coachella Valley Energy Conservation Initiative which adopted the goal of energy conservation and resource sustainability including the goal to reduce valley wide per capita energy consumption by 10% by 2012. This goal was promoted by the U.S. Conference of Mayors. By the first quarter of 2012, Cathedral City had realized 23% savings from the baseline for municipal building electricity usage and 11% community wide.

Desert Cities Energy Partnership

Most recently, Cathedral City has been an active participant in the Desert Cities Energy Partnership (DCEP)³. Working with the Coachella Valley Association of Governments (CVAG) and six other jurisdictions, the DCEP has kept a keen focus on municipal facilities.



Southern California Edison Energy Leader Partnership Program

Through its participation in Southern California Edison programs, Cathedral City continues to be committed to energy efficiency upgrades and participating in demand response plans. Cathedral City currently holds the Gold Level Status in the SCE Energy Leader Partnership Program.⁴

³ SCE’s partnership programs support local governments and institutions in achieving a joint vision of sustainability. The Desert Cities Energy Partnership is a joint venture between members, CVAG, SCE, Imperial Irrigation District (IID) and Southern California Gas (SoCalGas). Partnership actions support the California Long Term Energy Efficiency Strategic Plan and increase community awareness and participation in demand-side management opportunities.

⁴ For information on current Energy Leader Partnership requirements – baseline values and guidelines to achieve levels and thus bonus incentives – please contact CVAG or Southern California Edison.

Green for Life

The Green for Life program is funded by Southern California Edison. It provides Cathedral City with a number of valuable services, listed below.



- 1. Building “Tune-Ups” Through Commissioning/Retro-Commissioning (RCx):** The Green for Life Program will provide the City with a procedure to help it plan for equipment improvements and retrofits to reduce energy costs. Retro-Commissioning is a systematic investigation process for improving and optimizing the operation and maintenance of existing buildings. It primarily focuses on energy-using equipment and low-cost improvements rather than expensive capital-intensive retrofit measures. The RCx practice describes what is needed for a tune-up, and just as cars need tune-ups, Cathedral City will have the benefit of a sophisticated plan to maintain optimal comfort and human satisfaction while maintaining energy and cost efficiencies. Once adopted, the practice will be implemented by staff on an ongoing basis as funding is available.
- 2. Benchmarking:** Benchmarking is a method of comparing a building’s performance against an agreed upon standard, as well as comparing buildings’ similar in size, climate zone, occupancy and type to each other. City staff will learn how to benchmark City facilities using the no-cost Environmental Protection Agency Portfolio Manager program. This will allow the City to set a baseline for current energy use that can be compared to energy use after efficiency programs are implemented. Portfolio Manager will allow staff to track individual building energy performance, assess energy management goals over time, and identify strategic opportunities for savings in a secure online environment. A customized Benchmarking Practice has also been prepared, which provides guidance to staff on the maintenance and updating of benchmarking efforts.
- 3. Utility Manager: – Enterprise Energy Management Information System (EEMIS):** Through the Green for Life Program, the City will be provided with and trained to use the EEMIS utility management system. This system will allow the City to track energy use, and correlate it to energy cost at all its buildings and facilities. Monthly utility bills will be automatically uploaded into this system to provide monthly reports to guide energy management. The system will highlight energy-intensive facilities, and time periods, will flag anomalies in usage, and will allow for best practices to be put in place to cut costs.
- 4. Voluntary Green Building Program:** A regional Voluntary Green Building Program has been developed, and was adopted on August 8, 2012 by the City Council, which will allow owners of new and remodeled homes, apartments and businesses to reduce their energy use and improve their buildings to exceed by 15% the requirements of the California Energy Code (Title 24 of the Building Code). The program, complete with training for staff, contractors and community members, provides tools for increasing energy efficiency and reducing GHG emissions.

5. **Greenhouse Gas Inventory:** Green for Life has provided Cathedral City with a 2013 Greenhouse Gas Inventory with a 2010 baseline year. Following industry protocols, the document identifies and measures the total amount of greenhouse gases attributed to the community in the baseline year, providing a starting point for future emissions reduction actions.

6. **Climate Action Plan:** To complement this Energy Action Plan, the Cathedral City 2013 Climate Action Plan (CAP) has been prepared. Based on findings from the GHG Inventory, plus input from City staff, commissioners, city council, and stakeholders, the Climate Action Plan lays out the emissions reduction goals for the entire community. The Climate Action Plan then lays out a step-by-step plan of recommended actions for reaching those goals, including City-endorsed actions for short-term, mid-term and long-term phases.



7. **Energy Action Plan:** This Energy Action Plan focuses on municipal energy use and opportunities for Cathedral City to “lead by example” to influence community-wide behavior. It is based on findings from an assessment of city facilities, an SCE review of energy efficiency measures, the GHG Inventory, and input from staff and stakeholders. It defines next steps for energy savings and energy management upgrades in terms of costs to the City and also in terms of relative cost-effectiveness (i.e., kilowatt hours saved, payback period).

8. **Regional Planning:** A final element of Green for Life, and one important to Cathedral City, is a regional planning assessment.⁵ How can the region get carbon credits for local solar, wind, and geothermal installations? How will climate adaptation be addressed? Regional collaboration will continue between the CVAG members, with a sharp focus on regional planning issues, from job creation to mitigating emissions related to energy use and transportation.

Awards and Recognition

Cathedral City has earned a distinguished collection of awards for its environmental conservation initiatives. Many of the following are for housing, youth programs, water efficiency, youth governance, waste management and recycling, demonstrating the City’s progressive stance.

⁵ Briefing on Climate Action Planning for Elected Officials in the CVAG Region, Prepared by EcoMotion for the Coachella Valley Association of Governments, May 2013.

One of its most recent awards is the December 2011 American City & County Magazine's Crown Communities winning entry for Cathedral City's School Recycling Partnership.

League of California Cities

- **Award: 2006 Helen Putman Award for Excellence - Grand Prize**
Category: Public Safety Program
Program: Stop Identity Theft
- **Award: 2011 Helen Putman Award for Excellence**
Category: Ruth Vreeland Award for Engaging Youth in City Government
Program: Cathedral City Environmental Conservation and Elementary Schools Partnership Program
- **Award: 2011 Helen Putman Award for Excellence**
Category: Housing Programs & Innovations
Program: WaterSmart Landscapes Grant Program
- **Award: 2012 Helen Putman Award for Excellence**
Category: Planning and Environmental Quality
Program: Cathedral City Energy Action Plan

CAPIO (California Association of Public Information Officials)

- **Award: 2006 Honoring Excellence in Communications - Award of Merit (3rd)**
Program: Stop Identity Theft

CRRA (California Resource Recovery Association)

- **Award: 2007 Outstanding Waste Prevention Program**
Program: WaterSmart Landscapes Grant Program
- **Award: 2007 Outstanding C&D Diversion Program**
Program: *C&D Pilot Recycling Site* (RDA deconstruction/hotel program)
- **Award: 2009 Outstanding Household Hazardous Waste Program**
Program: Sharps Disposal by Mail Program
- **Award: 2011 "Next Generation" Recycler Award**
Program: Cathedral City/S.C.R.A.P. Gallery/School Recycling Programs

3CMA (City-County Communications & Marketing Association)

- **Honoring Creative Marketing & Communications (National Recognition)**
- **Award: 2005 Silver (2nd)**
Category: Printed Publications/Guide
Program: Resident Refuse & Recycling Guide

- **Award: 2006 Savvy Winner (1st)**
Category: Printed Publications/Calendar
Program: SCRAP & City Calendar
- **Award: 2007 Savvy Winner (1st)**
Category: Printed Publications/Guide
Program: Resident Refuse & Recycling Guide
- **Award: 2007 Award of Excellence (3rd)**
Category: Printed Publications/Calendar
Program: SCRAP & City Calendar
- **Award: 2008 Savvy Winner (1st)**
Category: Community Visioning
Program: Citizen Participation (trash container/school recycling program)

U.S. Conference of Mayors' Climate Protection Awards

- Small City Honorable Mentions (only 5 and only CA city)
Program: Cathedral City Action Plan

Cathedral City was recognized with fourteen awards between 2005 and 2012 for publications and calendars on environmental conservation, from resident refuse and recycling, to citizen participation, and community beautification, including the Landfill Lunch Box Book.

IV. Cathedral City Municipal Energy Usage

In 2010, Cathedral City spent a total of \$1,377,306 for energy in municipal operations. Of this, the largest expense was for fuel for the City’s fleets, primarily police, fire, and public works activities (\$772,951). Electricity was the second largest use at \$598,311, followed by natural gas consumption at \$6,044.

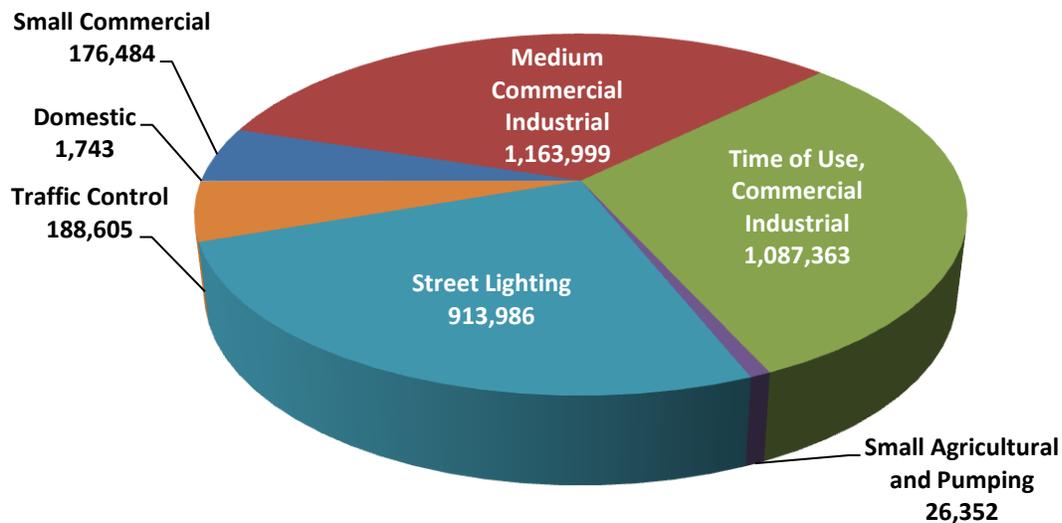
Municipal Electricity Usage for 2010

In 2010, 3,558,532 kWh of electricity were used in Cathedral City municipal facilities at a cost of \$598,311. This consumption is broken down into Southern California Edison rate categories which have varying energy and demand charges.

Table 2: Municipal Electricity Usage by SCE Rate Group, 2010

Rate Group	Usage (kWh)
Small Commercial	176,484
Medium Commercial/Industrial	1,163,999
Time of Use, Commercial/Industrial	1,087,363
Small Agricultural and Pumping	26,352
Street Lighting	913,986
Traffic Control	188,605
Domestic	1,743
Total	3,558,532

Figure 1: Cathedral City 2010 Municipal Electricity Usage by SCE Rate



The table below shows that the City Hall buildings constitute the predominant facility, using almost a third of the total electricity.

Table 3: 2010 Municipal Electricity and Annual Cost by Facility

Major Facilities	Cost	Usage (kWh)	%
City Hall (Acct # 3-013-5207-09)	\$141,191	1,087,363	30.6%
City Hall Parking Structure	\$38,290	242,196	6.8%
Public Works	\$21,135	114,240	3.2%
Fire Station 411	\$9,350	52,608	1.5%
Fire Station 412	\$17,676	109,280	3.1%
Fire Station 413	\$15,080	89,376	2.5%
Community Center	\$6,964	24,202	0.7%
Desert IMAX Theater	\$67,485	424,440	11.9%
Town Square Park and Town Center	\$16,573	136,679	3.8%
Subtotal	\$333,744	2,280,384	64.1%

Miscellaneous City-Funded Accounts	Cost	Usage (kWh)	%
Public Parking Lighting	\$1,378	3,730	0.1%
Intersections	\$8,967	54,169	1.5%
Pedestals	\$7,585	33,961	1.0%
City Grounds	\$12,573	42,330	1.2%
Parking Lots	\$2,492	13,272	0.4%
Subtotal	\$32,995	147,462	4.1%

Public Lighting	Cost	Usage (kWh)	%
Park and Public Spaces Lighting	\$16,099	210,912	5.9%
Street Lights	\$177,079	695,693	19.5%
Outdoor Lighting	\$1,776	7,381	0.2%
Subtotal	\$194,954	913,986	25.7%

Traffic Control	Cost	Usage (kWh)	%
Traffic Controls	\$31,072	188,605	5.3%

Water Delivery	Cost	Usage (kWh)	%
City Pumping Facilities	\$5,215	26,352	0.7%

Domestic	Cost	Usage (kWh)	%
Domestic Use	\$331	1,743	0.0%

Total	\$598,311	3,558,532	
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All municipal electricity bills from 2010 were organized by usage and cost.

Table 4: Cathedral City 2010 Top Municipal Electricity Users

Municipal Facility	Annual Cost	Usage (kWh)
City Hall Buildings and Parking Structure	\$179,481	1,329,559
Street Lights	\$177,079	695,693
Desert IMAX Theatre	\$67,485	424,440
Park and Public Spaces Lighting	\$16,099	210,912
Traffic Controls	\$31,072	188,605
Town Square Park and Town Center	\$16,573	136,679
Public Works	\$21,135	114,240

Figure 2: Cathedral City Top Municipal Electricity Users (kWh)

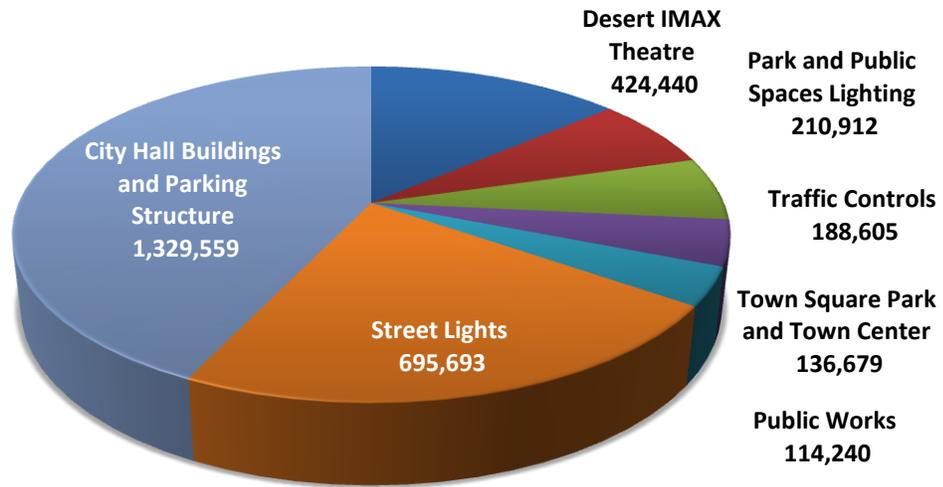
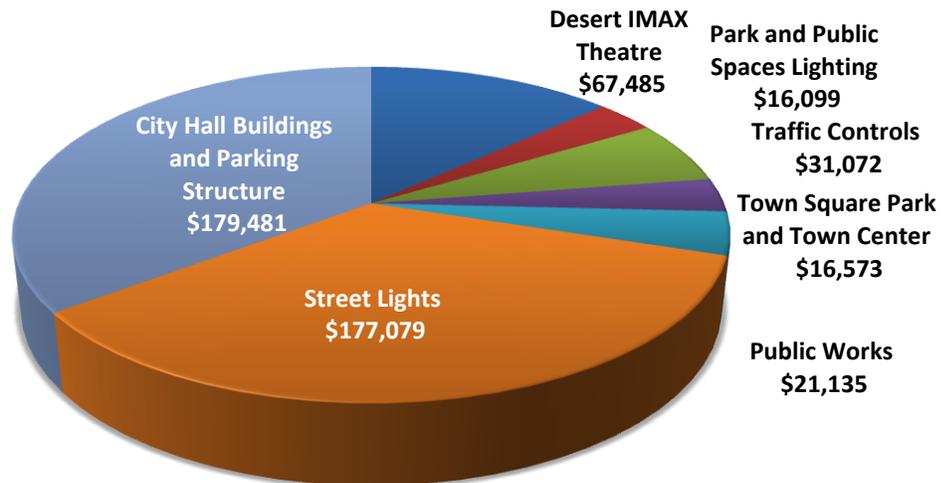


Figure 3: Cathedral City Top Municipal Electricity Users (Annual Cost)



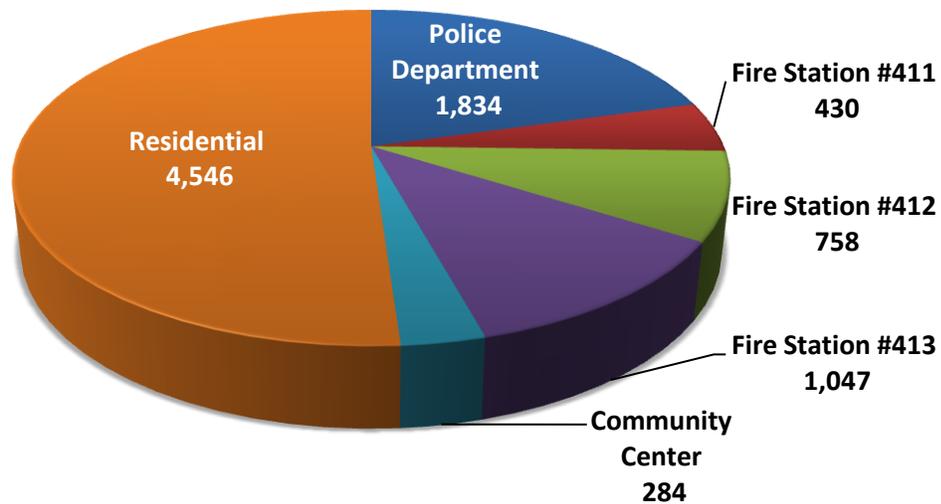
Municipal Natural Gas Consumption for 2010

According to information provided by Southern California Gas, the City consumed 8,899 therms of natural gas in 2010 at its municipal facilities at an estimated cost of \$6,044. Natural gas is primarily used for water and space heating, and cooking.

Table 5: Cathedral City 2010 Municipal Natural Gas Consumption

Facility Name	Therms	Est. Cost per Therm	Est. Total Cost
Community Center	284	\$0.89	\$253
Fire Station #411	430	\$0.63	\$271
Fire Station #412	758	\$0.63	\$478
Fire Station #413	1,047	\$0.63	\$660
Police Department	1,834	\$0.63	\$1,155
Residential	4,546	\$0.71	\$3,228
Total Municipal Natural Gas Consumption	8,899	\$0.00	\$6,044

Figure 4: Cathedral City Municipal Natural Gas Consumption (therms)



2010 Municipal vs. Community Electricity Usage and Natural Gas Consumption

Figures 5 and 6 below show citywide usage. Citywide includes usage from both the municipal accounts and all other accounts (residential and commercial) in Cathedral City. Note the relative size of the municipal energy accounts.

Figure 5: Cathedral City Community vs. Municipal Electricity Usage (kWh)

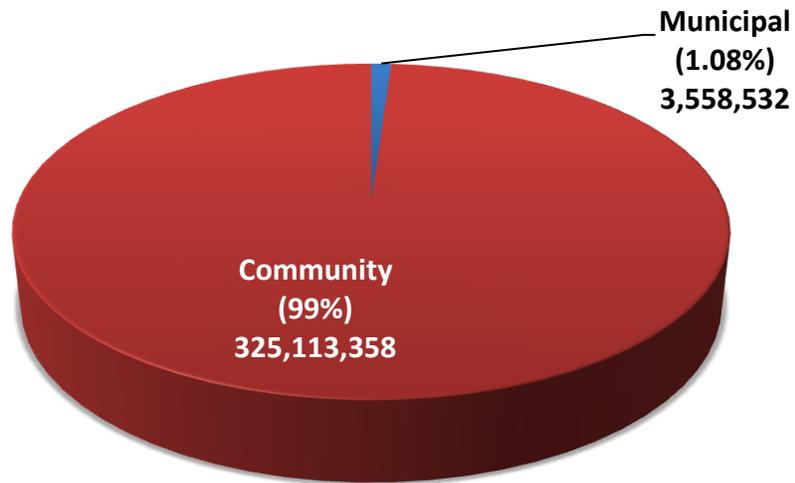
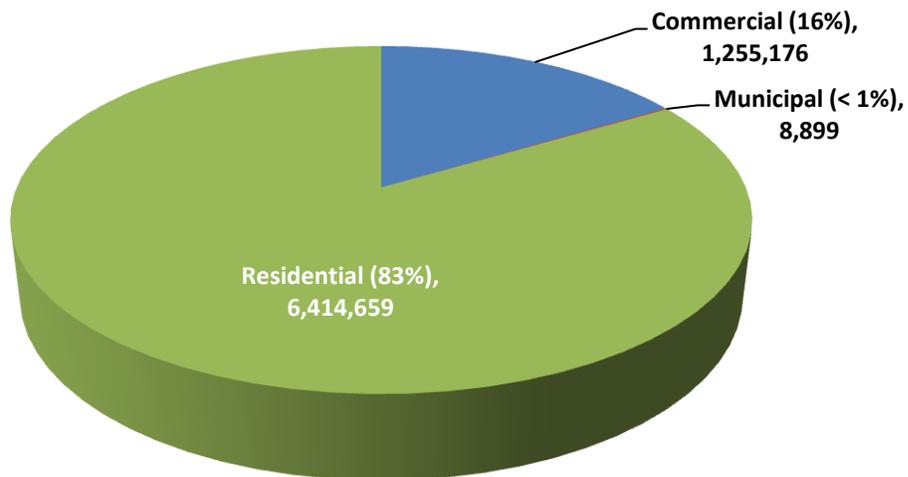


Figure 6: Cathedral City Community vs. Municipal Natural Gas Consumption (therms)



Municipal Facilities

Cathedral City operates public services and facilities such as the Civic Center, fire and police stations, public works yard, theatres, parks, street lights, and traffic controls.

The three-story 55,343 square foot Civic Center is the centerpiece of Cathedral City's downtown retail, housing, entertainment, and government core. The Civic Center houses both City Hall and the Police Department which include administration offices, an emergency operations center, temporary holding facility, and a 100-seat council chamber.

The Cathedral City Fire Department was established in 1988 and currently has three fire stations located strategically throughout the City to ensure care arrives on the scene within minutes of an emergency. The department receives in excess of 4,000 calls for service annually.

Fire Station 411 is the downtown station that operates a pumping truck and ambulance. In 2010, this station spent \$9,350 for 52,608 kWh of electricity.

Fire Station 412 is the headquarters station that operates a tiller ladder truck, a pumper truck and an ambulance. In 2010, this station spent \$17,676 for 109,280 kWh of electricity.

Fire Station 413 is the freeway station that operates a pumper truck and an ambulance. In 2010, this station spent \$15,080 for 89,376 kWh of electricity.

The Public Works Yard serves as the hub for the Public Works vehicle fleet. It also houses offices for staff and act as a collection point for recycling electronics and tires. The facility consumed 114,240 kWh in 2010 for a cost of \$21,135.

Cathedral City Redevelopment Agency acquired the Desert IMAX building and a third party has been managing the theatre since 2001. In 2010, the theatre consumed 424,440 kWh at a cost of \$67,485.



Town Square, where all types of festivals and events occur, sits directly in front of City Hall and is where the award-winning Fountain of Life resides. The fountain, featuring soft surfacing from 100% recycled California tires and recycled tiles, serves as an attraction where children and adults play in the water. The fountain's use is guided by a City ordinance regulating appropriate use. In 2010, the Town Square Park and Town Center consumed 136,679 kWh of electricity at a cost of \$16,573.

Street Lights in Cathedral City consumed 695,693 kWh in 2010 for a cost of \$177,079. There are 99 electricity accounts associated with streetlights that power intersections throughout the City. Traffic Controls consumed 188,605 kWh at a cost of \$31,072. Cathedral City operates and maintains 46 traffic control accounts representing intersections throughout the City.

Municipal Vehicle Fleet

Cathedral City’s vehicle fleet consisted of 143 vehicles in 2010 and is primarily operated by Public Works, Police, and Fire staff. The fleet vehicles were driven 1,173,258 miles in 2010, consuming 56,082 gallons of gasoline, 15,127 gallons of diesel, 10,973 gallons of compressed natural gas, and 1,802 gallons of propane.

Table 6: Cathedral City 2010 Municipal Fleet Fuel by Fuel Type

Fuel Type	Gallons Used	Fuel Costs per gallon*	Fuel Costs
Gasoline	136,523	\$3.46	\$472,370
CNG	67,845	\$2.17	\$147,224
Diesel	42,483	\$3.50	\$148,691
Propane	1,802	\$2.59	\$4,667
Total			\$772,951

Figure 7: Cathedral City Municipal Fleet Fuel by Fuel Type (gallons)

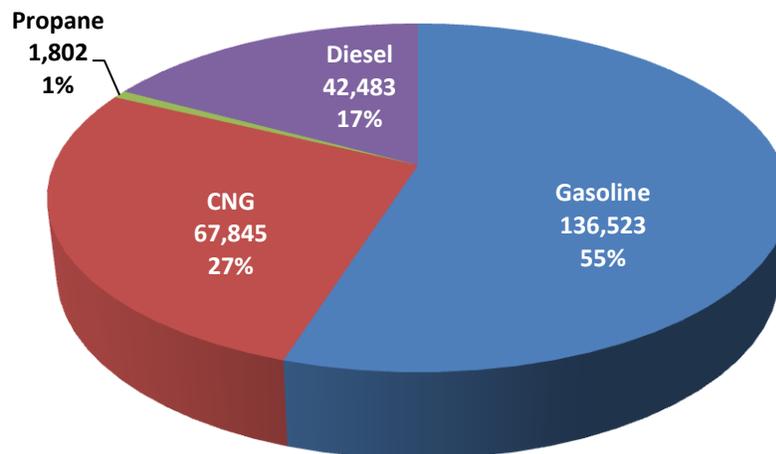


Table 7: Cathedral City 2010 Municipal Fleet Fuel Breakdown by Department

	Gasoline (gal)	Diesel (gal)	CNG (gal)	Propane (gal)
Municipal On-Road Fleet Fuel	90,178	32,827	64,667	-
Police On-Road Fleet Fuel	41,680	-	3,178	-
Fire On-Road Fleet Fuel	4,665	5,990	-	-
Municipal Off-Road Fleet Fuel	-	3,666	-	1,802
Total	136,523	42,483	67,845	1,802

In a continuing effort to meet air pollution targets, and to facilitate the replacement of old diesel vehicles with new CNG vehicles, in 2008 the City of Cathedral City constructed a CNG refueling station at the City maintenance facility. Having its own local station saves the City well over \$100,000 a year in staff time and actual fuel costs.

V. Cathedral City Energy and Cost Management Goals

Cathedral City is a valley leader in energy efficiency and the promotion of renewables, notably solar at the Civic Center. The City has participated in a number of innovative partnerships, and has been awarded for its performance in energy and waste management in particular.

Like many other California cities, Cathedral City has been hard hit by the prolonged recession. That comes on top of an economy badly in need of economic development. The City has no major industry and as a bedroom community with property values depressed, it has had to release staff and trim operations.

Economic circumstances in Cathedral City shape the goals in this Energy Action Plan. The goals presented are pragmatic, reasonable steps for the next three years. However the City is making a commitment to energy action and plans to continue to implement the goals and objectives of this Plan beyond 2015. The goals are planning and action steps that will be revisited in years to come, and as the City's economy improves, staff and officials will have the opportunity to make its goals and proactive steps ever-more aggressive.

The goals fall into three categories: City Facilities, City Fleet, and Community-Wide Policies.

City Facilities

Cathedral City has two complementary energy management goals:

First, is the commitment made by leaders in 2008 for 10% energy savings throughout the Valley, known as the Coachella Valley Energy Conservation Initiative. Second is the opportunity to achieve higher levels in the Southern California Edison Energy Leader Partnership Program. By doing so, Cathedral City can earn greater and greater incentives for retrofits.

- **Coachella Valley Energy Conservation Initiative:** In 2008 the Mayor of Cathedral City signed a pledge in solidarity with other CVAG members and officials to reduce energy use in municipal facilities by 10% by 2012, from a baseline of 2005. Cathedral City has shattered this goal: With the installation of the Honeywell project and more recent EECBG and Southern California Edison funded upgrades, this goal has been exceeded for municipal facilities (23%). It has also been attained community-wide (11%). Savings and solar generation since 2005 have been 758,196 kWh in City facilities and 38,553,670 kWh community-wide.
 - **25% by 2015:** Given its great strides thus far and the economic benefits accrued, Cathedral City will continue to find ways to cut energy use in City facilities and to attain the highest efficiency and renewable energy generation levels practical, leading the way in the Coachella Valley. The immediate goal will be to attain a 25% savings

Cathedral City

25%

City Facility
Energy Savings Goal
By 2015

from its 2006 baseline by 2015. This will require an additional 65,482 kWh in energy efficiency savings or renewable generation.

- **Southern California Edison Energy Leader Partnership:** Given changes to the energy efficiency requirements for the Energy Leader Partnership program, currently Cathedral City is a Silver partner in the Southern California Edison Energy Leader Partnership program. By new rules, and without solar, the City has achieved 7.46% from its 2006 baseline consumption of 2,622,847 kWh. To maintain Gold Partner status, Cathedral City will need to achieve an additional 66,500 kWh in annual energy efficiency savings to reach 10%. (All other criteria for Gold have been met.)
- **Basic Investment Threshold:** All efficiency measures and renewable energy systems within a four-year payback will be implemented provided that capital improvement costs can be invested without harm to other City operations and services.
- **Public Private Partnerships:** All secure third party arrangements that lower costs in year one and throughout the life of the measures will be examined for implementation.

City Fleet

To cut costs and achieve the win-win between economy and environment, the City will continue to improve the efficiency and to limit the emissions of its fleet.

- **Maintenance Practices for Fuel Efficiency:** The City will maintain its fleet to the highest standards.
- **Driver Training for Safety and Efficiency:** City staff will periodically be trained in safe and economic driving and effective maintenance.
- **Moving to Alternatively Fueled/Powered Non-Emergency Public Safety Vehicles:** To the greatest degree possible, the non-emergency public safety vehicles will be replaced with compressed natural gas vehicles.
- **Lifecycle Benefit Analysis Used for Procurement:** All vehicle leases and purchases will be thoroughly examined to determine their lifecycle costs and benefits.
- **Fleet Efficiency Investment Threshold:** Purchase decisions will be made based on lifecycle costs.

Community-Wide Policies

Cathedral City will continue to serve its residents and businesses, keeping government regulation to the minimum extent required to protect ratepayers from excessive energy prices. The City will adopt “no-regrets” policies and ordinances that assure access to energy efficiency and renewable energy for all:

- **Setting a Voluntary Community Goal of 15% by 2015:** Recognizing that it has achieved and slightly exceeded the 10% regional goal for community savings, Cathedral City will urge residents and businesses to renew their initiative, and to aspire for 15% savings by 2015. Doing so will demonstrate civic duty, save money, and protect the environment.
- **Green Building:** Green building measures will be supported through ordinances that do not place an undue burden on developers and homeowners; these green building measures can increase the value of new and existing homes. The marginal costs for designated green building measures and higher efficiency devices – which have a payback of less than or equal to four years – will be mandated for all new construction.
- **Solar Access:** Solar access will be assured through zoning and the planning process. Suitable rooftops and properties will be protected through solar mapping and following the requirements of existing California solar rights law.
- **Retrofit Upon Resale:** The City will seek to establish a retrofit upon resale ordinance for each of the residential and commercial sectors such that the most basic efficiency upgrades – CFLs, low-flow toilets, and thermostats – are in place for the turnover of a property.
- **PACE Advocacy and Action:** Cathedral City supports the regional goal for an effective PACE program.
- **Electric Vehicle Infrastructure:** Cathedral City will continue to advocate for owners and prospective owners of electric vehicles (EVs) and to facilitate the use of EVs through expansion of renewable power charging stations.
- **Regional Transportation Alternatives:** Cathedral City supports the regional goal for enhanced transportation systems, particularly alternatives for lower and middle-income residents who are regressively affected by gasoline prices.



VI. Cathedral City Energy Action Steps

For each one of the goals, the City will consider and prepare to take action. In some cases, the actions will be low cost and addressed in the short term. In some cases they will be ongoing activities to promote a healthy energy future for the City as a whole. Naturally, more significant capital upgrades will take more time to implement.

The projects and initiatives presented here cut across departmental lines. Ultimately, the City Manager is responsible for the execution of this Energy Action Plan adopted by the Cathedral City Council. Within the City, the Public Works Department has overall responsibility for the Energy Action Plan and its implementation.

Municipal Facilities

A Road Map for Additional Energy Savings in Municipal Facilities

Cathedral City has two energy efficiency projects planned for its municipal facilities. Together, these are expected to result in 88,274 kWh in annual savings. One project involves replacing a 50-ton HVAC unit at the City's library; the other involves the installation of highly efficient, bi-level induction lighting at the Civic Center parking structure.

In February of 2012, Green for Life conducted walk-through assessments for all municipal facilities in the Desert Cities Energy Partnership to identify additional opportunities for energy efficiency. This work was done in Cathedral City in early March 2012. The assessments revealed a number of energy efficiency measures for City consideration and ultimately retrofits.

The spreadsheet below in Table 8 is followed by a narrative adding description to potential efficiency measures. These measures represent a menu of options to reach the 25% goal. Order of magnitude costs and savings are presented, with estimated, simple paybacks.

Cathedral City will continue to use and refine this guide to plan projects in the coming years. As measures are considered, the City will seek competitive bids to refine the estimates presented herein.

The 24 measures presented have an estimated, combined energy-savings value of 188,157 kWh, more than enough savings to reach the 65,482 kWh "gap" to achieve the City's 25% goal, and to fulfill the 66,500 kWh necessary to meet Southern California Edison's 2013 energy efficiency requirement for the Gold Level in the Energy Leader Partnership.

Note: The Cathedral City Community Center was included in the comprehensive walk-through assessment of City facilities with the full understanding that the fate of this facility is unknown at this time. (For years it has been slated for demolition; but it continues to be used.) In the scenario that no upgrades are feasible at the Community Center, the balance of efficiency measures listed below is sufficient to achieve the City's internal goal and the SCE Energy Leader Partnership step.

Table 8: List of Energy Efficiency Measures for Cathedral City

Equipment Type	Energy Efficiency Measure	Energy Efficiency Measure	Description of Measure with Assumptions	Annual kWh Savings	Total Project Cost	Simple Payback (Years)	Top Priority Projects
City Hall 68700 Avenida Lalo Guerrero, Cathedral City, CA 67,000 sq. ft. Year Built: 1998							
Interior Lighting	Day lighting	Maximize day lighting opportunities	Install tubular skylights in all hallways and bathrooms to maximize day lighting and lessen energy used for lighting, where feasible	4,096	\$4,000	7.8	
Building Envelope	Exterior Shading	Install exterior window shading of Council Chamber	Install retractable shade over all southern and western facing windows with 50% weave pattern. (Perhaps a Solar Cloth Demo)	1,900	\$10,000	41.8	
Public Works 68385 Kieley Rd., Cathedral City, CA 10,000 sq. ft. Year Built: 1978							
Interior Lighting	Interior Lighting Retrofit	Retrofit all existing fluorescent light fixtures	Change out all existing T-12 light tubes with T-8 light tubes.	2,000	\$2,750	10.9	
	Day lighting	Maximize day lighting opportunities	Install tubular skylights in all hallways and bathrooms to maximize day lighting and lessen energy used for lighting (electrified), where feasible	15,360	\$15,000	7.8	
	Lighting Controls	Install lighting sensors	Install ultrasonic motion sensors in all common areas (Restrooms, offices, etc.)	2,060	\$750	2.9	X
HVAC	Energy Efficient Air Conditioner	Replace equipment room AC units with Evaporative Coolers	Replace existing 4 Ton RTU with 5,000 CFM evaporative cooler	15,000	\$6,600	3.5	X
		HVAC Roof Top Unit Change out	Replace 2, 5-ton Roof Top Units with higher SEER rated Units. Save 3,521 kWh/unit (annual)	7,020	\$22,000	24.9	
Fire Station 411 36913 Date Palm Dr., Cathedral City, CA 4,900 sq. ft. Year Built: 1982							
Building Envelope	Window change out	Replace Existing TVs with ENERGY STAR® LCD Models	325 Sq. Ft. of single pane glass to be retrofit with double pane glass	1,235	\$19,500	125.3	
Appliances	Energy Efficient Washer and Dryer	ENERGY STAR Appliance Upgrade - Washer and Dryer	Upgrade laundry facility washer and dryer to ENERGY STAR rated Appliances (Non Commercial)	3,000	\$2,400	6.3	
Fire Station 412 32100 Desert Vista Rd., Cathedral City, CA 8,200 sq. ft. Year Built: 1985							
Exterior Lighting	Exterior Lighting Retrofit	Retrofit Exterior Security Lighting	Retrofit 2-150W Metal Halide Exterior Security Lights with CFL or LED (28 W)	732	\$350	3.8	X
HVAC	Energy Efficient Air Conditioner	HVAC Roof Top Unit Change out	Replace 5-ton Roof Top Unit with higher SEER rated unit. Save 3,521 kWh/unit (annual)	3,510	\$11,000	24.9	
			Replace 2, 3-ton Roof Top Units with higher SEER rated Units. Save 3,028 kWh/unit (annual)	6,054	\$13,200	17.3	

Equipment Type	Energy Efficiency Measure	Energy Efficiency Measure	Description of Measure with Assumptions	Annual kWh Savings	Total Project Cost	Simple Payback (Years)	Top Priority Projects
Solar Photovoltaic Energy Generation	Install Solar Panels	Potential Installation of Solar on Northern Roof	Install PV Solar on North roof for power generation. Minimal shading at location	28,000	\$120,000	34.0	
Building Envelope	Window Change out	Replace Existing Single Pane Entry With Double Pane	Window/Entry way glazing change out from single pane to double pane (320 sq. ft.)	1,216	\$19,200	125.3	
Fire Station 413 27-610 Landau Blvd., Cathedral City, CA 4,700 sq. ft. Year Built: 1997							
Building Envelope	Window Change out	Single Pane Window Change out to Double Pane	Metal Frame SP D/W Combo - West Entrance (12 x 18)	821	\$12,960	125.3	
			Double Door w/ Metal Frame SP - East Second Floor (6 x 7)	160	\$2,520	125.3	
			10 - 2'X2' Square Single Pane Windows (20 x 20)	1,520	\$24,000	125.3	
	Exterior Shading	Install Exterior Window Shading	Install shade cloth or louvers over 10 - 2' X 2' square single pane windows in lieu of change out	1,890	\$450,000	1,889.6	
HVAC	Energy Efficient Air Conditioner	HVAC Roof Top Unit Change out	Replace 2, 3-ton Roof Top Units with higher SEER rated Units. Save 3,028 kWh/unit (annual)	6,054	\$13,200	17.3	
	Energy Efficient Evap. Cooler	Evaporative Cooler Unit Change out	Replace 3 Evaporative coolers with Energy Efficient - 5,000 CFM Evaporative coolers	10,530	\$33,000	24.9	
Community Center 68715 E Palm Canyon Dr., Cathedral City, CA 16,500 sq. ft. Year Built: 1993							
Building Envelope	Ceiling Insulation	Add Ceiling Insulation (R-38)	Install R-38 ceiling insulation throughout building.	9,500	\$2,500	2.1	X
	Window Change out	Single Pane Window Change out to Double Pane	Retrofit all Single pane windows throughout to double pane	50,000	\$18,000	2.9	X
Interior Lighting	Interior Lighting Retrofit	Retrofit all existing fluorescent light fixtures	Change out all existing T-12 light tubes with T-8 light tubes.	1,500	\$4,125	21.8	
HVAC	Energy Efficient Air Conditioner	HVAC Roof Top Unit Change out	Multiple units require upgrades to higher SEER rated RTU's	15,000	\$30,000	15.9	
				188,157	\$832,055		

In each case, Green for Life recommends “investment-grade” audits and analyses of vendor proposals for technologies and financing. Furthermore, the City’s posture will be defined by a) maintaining and opportunistic stance, b) tracking emerging technologies for cost-effectiveness, and c) investing in secure and cost-effective capital improvements.

The following bullet points present operating parameters for energy action planning in the City of Cathedral City, and then specific actions for municipal facilities, the municipal fleet, and community-wide policies under the City’s control.

- **Maintaining an Opportunistic Stance**

- The City will continue to seek grants from federal, state, and regional sources. For example, the recent community block grants were a tremendous boost to the City without matching requirements.
- Foundation support will also be considered and tracked.
- Incentives from utilities – notably Southern California Edison and Southern California Gas – and including the water utilities and air quality management district. Of particular interest are upgrades to HVAC systems, lighting upgrades, and sensors.

- **Tracking Emerging Technologies for Cost Effectiveness**

- At this time, the City has tapped nearly all efficiency measures with a payback of four years or less. To continue to lead and save, now projects with up to seven-year paybacks will be evaluated for Council consideration.
- As incentives change, and technologies' prices drop, the City will track measures for implementation, bringing all measures with less than a four-year payback to Council for capital cost investment approval.
- The Public Works Department will be responsible for an annual review of energy efficiency retrofit opportunities.

- **Investing in Cost-Effective and Secure Capital Improvements**

- Cathedral City will continue to pursue investment in proven technologies.
- Cathedral City will continue to pursue grants and incentives for energy efficiency upgrades and programs.
- Investments will have guaranteed or assured paybacks less than or equal to 4 years.

Municipal Fleet

- **Maintaining Fleet Performance and Efficiency**

- Public Works will to continue to maintain the fleet for optimal performance and efficiency, including monitoring tune-ups, tire pressure, etc.

- **Offering defensive driving courses to enhance employee safety and to reduce fuel use**

- The City will promote safety and fuel efficiency through driving courses.

- **Continuing to procure alternatively fueled vehicles to the greatest degree feasible**

- The City will continue to analyze and purchase vehicles using lifecycle benefits for the efficiency of compressed natural gas and other efficiency solutions – such as hybrids, plug-ins, fuel cells, etc.
- Cathedral City will invest in all high efficiency options with a payback equal to or less than four years. Paybacks equal to or less than four years will trigger purchases of vehicles that may have higher first costs, but lower operating costs over time.

Municipal Policies

- **Cathedral City will continue to explore municipal policies that increase energy efficiency for the benefit of the City. Several policies will be considered in the short term:**
 - Establish a revolving loan fund for internal efficiency upgrades. Rules for use of the fund and its reimbursement will be established.
 - Implement the City’s benchmarking practice to provide best practices for benchmarking city facilities to track energy use
 - Implement the City’s Commissioning/Retro-Commissioning practice and procedures to identify a plan for maintaining energy and cost efficiencies as well as optimal comfort and human satisfaction
 - Determine how best to include a dynamic Energy Action Plan in the General Plan.
 - Examine state and federal incentives for energy efficiency to augment incentives provided by Southern California Edison, Southern California Gas, and others.
 - Consider energy efficiency in capital improvement budget discussions.

Community Programs

- **Supporting the Regional and Potential State PACE Program**
 - Cathedral City will support the regional PACE program being developed by the Coachella Valley Association of Governments.
 - Cathedral City will consider CalFIRST, the statewide initiative being introduced in 2012 by the California Statewide Community Development Agency (CSCDA).
 - Cathedral City will lend its support for legislative efforts to curtail FHFA actions blocking lien seniority.
 - These legislative efforts will be complemented by proactive planning for PACE implementation in Cathedral City for maximum benefit.
- **Electric Vehicle and CNG Infrastructure**
 - Cathedral City will follow a deliberate plan to develop an infrastructure for EVs and CNG vehicles.
 - Cathedral City will establish additional charging/refueling stations at City facilities.

- Cathedral City will work with local gas stations and others to promote public charging/refueling stations.
- Cathedral City will continue to seek grants and partnerships to increase penetration of EVs and CNG vehicles in the community.



- **Voluntary Green Building Program**

Cathedral City has adopted the Voluntary Green Building Program developed by CVAG for the Green for Life project. The City will:

- Consider adopting program as mandatory in advance of Title 24 revision in 2014
- Consider additional green building measures not included in Title 24 as technologies become accessible
- Promote green building highlighting the potential to cut costs, increase comfort, provide healthier living spaces, and boost local supply lines and products, while cutting energy use and carbon emissions.
- Increase the value of new and existing homes with green building measures.
- Inform property owners and builders of the benefits and marginal costs of green building through the Voluntary Green Building Program.
- Support the Voluntary Green Building Program through policies and ordinances that do not unduly burden developers and homeowners.
- Consider, ultimately, green building measures and higher efficiency devices with a payback of less than or equal to four years to be mandated for all new construction.

VII. Tracking, Evaluation, and Continuous Improvement

Cathedral City will track its success systematically. This will involve a three-part process of:

1. Tracking energy use and effectiveness of energy efficiency measures
2. Evaluation
3. Continuous improvement.

What can the City do better? This will be the ongoing question as energy costs are contained.

Tracking

Thanks to Green for Life and its utility manager element, energy usage will be tracked monthly for Cathedral City's primary facilities. This will provide a much-needed snapshot of energy use, tracking month-to-month, and year-to-year to flag anomalies. The Energy Coordinator will evaluate the monthly data, respond to alarms that flag unusual energy use, and share with relevant departments and the City Manager.

Other energy use, such as transportation fuel costs, will be tracked quarterly by the Public Works Department for annual reviews. Based on these reviews, the City will determine energy-savings priorities, and track opportunities given grant opportunities and low-interest loans.

Monthly reports will be closed out at the City's fiscal year-end to show progress and note any issues that will lead to further efficiency and/or operational improvements.

Evaluation

Cathedral City understands the importance of third-party evaluation of its efforts. While no funds can be budgeted for evaluation at this time, the City welcomes regional evaluations and/or specific evaluations of its programs and services, both from an impact and a process standpoint. Ideally, the energy and cost management program outlined herein would be evaluated every two years. It will answer questions such as: Have all the action steps been addressed in a timely manner? What gains have been made to cut and/or hedge future energy costs?

Continuous Improvement

Cathedral City will not only share its results with other CVAG cities and cities within the Southern California Edison service territory, but it will deliberately reach out to learn from others.

Keeping a focus on energy management requires new and fresh concepts, new ideas to stimulate new forms of City leadership in energy management and sustainability. This is hard to buy, but critical for success. Community leaders may well infuse the process.

To the greatest degree feasible, the City will maintain an open attitude to new ideas that might save money for the City. Secure arrangements that are “at parity” in costs, or cost less than business as usual, will continue to be explored for implementation.

VIII. Conclusion and Next Steps

Cathedral City, like many other California cities and cities across America, is suffering from the economic recession. Property values have been slashed, cutting property taxes, resulting in fewer resources to maintain City services. On top of that, Cathedral City had already been hit hard by high unemployment and limited business activity.

This 2013 Energy Action Plan, therefore, is an especially important tool. It provides a framework, a roadmap for continued savings through energy efficiency.

- Where can the City’s ~\$1.3 million energy bill be cut?
- Can energy-cost savings maintain another employee, field another police officer, or keep the library open seven days a week?
- How can the City help to shape its facilities and infrastructure such that opportunities for energy efficiency are maximized and energy costs are reduced?

The City also recognizes the importance of regional initiatives, whose savings can dwarf all other initiatives discussed. PACE could be a “game-changer,” and at almost no cost to the City.

This Cathedral City 2013 Energy Action Plan codifies leadership and commitment. The City has already far exceeded its energy efficiency goals, achieving a 23% reduction in conventional power usage in municipal facilities from its 2004 baseline, when the goal was a 10% reduction. Now additional projects are planned to attain and eclipse the 25% goal.

Next Steps

This Cathedral City 2013 Energy Action Plan will be considered implemented when the following steps are complete:

1. The City has achieved a 25% reduction of conventional electricity use in its municipal facilities from the 2006 baseline. Concurrently, emphasis will be made to lower the energy intensity of the City’s fleet of vehicles.
2. The City has worked throughout the 2013 – 2015 timeframe to encourage its residents and businesses to achieve a community-wide 15% reduction from the 2005 baseline.
3. The City has achieved a 10% energy efficiency savings from its 2006 baseline to fulfill the Energy Leader Partnership program requirement for Gold Partner status.
4. The City has diligently promoted the value of efficiency – for jobs and economic development, etc. – and will steer residents and businesses to utility incentives and financing sources.

5. Through policy-making and regional funding collaborations and public/private partnerships, the City has promoted all cost-effective energy-efficiency through capital improvements, diligent operations, third-party arrangements and financing opportunities, tapping advances in technologies and cost reductions.

To fund energy efficiency measures, the City will consider all available financing options. Through the Desert Cities Energy Partnership, SCE makes available a no-interest, on-bill financing program for energy efficiency measures. The City aggressively pursues grant opportunities and will seek grant funding when available. The City could consider self-funding energy efficiency measures that result in cost savings. The City may also consider an energy efficiency revolving fund. As measures are considered, the City will refine the estimates presented herein or opt to seek competitive bids. Cathedral City will continue to use and refine this guide to plan projects in the coming years.

Finally, Cathedral City is a Valley leader in energy efficiency, and will continue to be a leader, fully engaged and active with smart energy management. Two projects are in advanced planning stages, and 24 more opportunities serve as a menu for future action. Practical goals are set that can be amended and expanded over time. The City is within sight of a remarkable milestone; this Plan defines a rational path for its achievement.

IX. Southern California Edison Energy Leadership Program Level Criteria (July 2013)

The following criteria define the Southern California Edison Energy Leadership Program level criteria. To advance, each city must achieve increasing levels of 5%, 10%, and 20% savings in municipal electricity use from a 2006 baseline in addition to the creation and implementation of an Energy Action Plan. In addition to municipal energy savings, the Leadership program has had a community energy savings requirement which has been replaced in 2013 with a new means of fulfilling the community requirement through community outreach. As the criteria are met, SCE partners can advance to higher levels of greater distinction. The higher levels also provide higher incentives for energy efficiency retrofits, reflecting the degrees of difficulty in achieving greater levels of savings.

Silver Level – Initiate Energy Action Plan

The Partner City/County demonstrates initiation of an EAP to qualify for the Silver level criteria. This can include any of the following options:

- A. Partner selected and was approved for Strategic Plan menu item 3.2.1
- B. A draft of an EAP is submitted by Partner City/County
- C. RFP issued or consultant hired to complete EAP

Gold Level - Complete EAP

The Partner City/County must submit a completed plan to SCE, which includes (at least) the following components:

- A. Establish long term vision and plan for energy efficiency in City/County (In kWh savings or % reduction)
- B. Clearly states the aim and objectives of the plan
- C. States baseline year and records the baseline municipal energy usage (kWh)
- D. Displays the highest users (facilities) that the city should target (using most current kWh data)
- E. Identifies the City/County reduction goals to help reach long term target (kWh)
- F. Provides the plan of municipal facility projects that the City/County can complete to assist in achieving their reduction (Provide savings calculated for each project)
 - i. Identify priority of projects
 - ii. Identifies expected funding mechanisms to complete municipal facility EE projects
- G. Identifies any policies or procedures the City/County can implement to assist in reducing energy use
- H. Identify the actions that will constitute the EAP is considered implemented (a requirement if partner desires to obtain ELP Platinum Level). This identification can be made through various options such as included in the EAP, a staff report, resolution, or the attached Appendix (A) in Section 2. C. to delineate implementation actions that shall include, but are not limited to, municipal retrofit projects, policies, and procedures discussed in the EAP (per criteria F and G).

Platinum Level – Implement EAP

The Partner City/County must do each of the following:

- A. EAP must be approved/adopted by City Council/Board of Supervisors
- B. Implementation actions must include the following:
 - i. Evidence of inclusion of energy efficiency in the city/county operating budget, e.g., line item in the operating budget or a letter from a ranking official (such as, a city manager, public works director, or department head responsible for the city's budget) stating that a specified portion of the local government's budget is directed towards energy efficiency;
 - ii. Evidence of integration of the vision on future, long-term energy action planning exhibited by the EAP into long term policies such as the General Plan, climate action plan, or sustainability plan;
OR
adopt the following resolution, "RESOLVED that the vision and direction of the completed Energy Action Plan will now serve as a guide to the City of Cathedral City in future energy efficiency

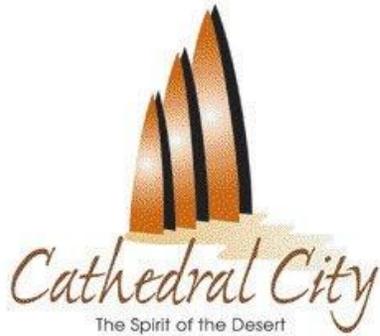
planning and initiatives that will be incorporated in a long term policy document such as the General Plan, climate action plan, or sustainability plan."

- iii. Evidence the EAP has been implemented: Identify the projects, policies and actions delineated in the EAP whose completion comprises the implementation of the EAP per Gold Level H criteria. This identification could have been made through various options such as included in the EAP, a staff report, resolution, or the attached Appendix (A) in Section 2. C. to delineate implementation actions that shall include, but are not limited to, municipal retrofit projects, policies, and procedures discussed in the EAP (per criteria F & G).

Appendix A: Cathedral City Energy Benchmarking Practice

Appendix B: Cathedral City Commissioning/Retro-Commissioning Practice

Energy Benchmarking Practice and Procedures



for **Municipal Buildings** in the **City of** **Cathedral City**

Funded by:

Southern California Edison Company

Local Government Strategic Plan Strategies Program

2010 – 2012 Program Period

under the auspices of the California Public Utilities Commission

Strategic Plan Task 3.1.1

Deliverable 3.A.3 – Final

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Designing Your Sustainable Future

Under:

COACHELLA VALLEY ASSOCIATION OF GOVERNMENTS



May 2013

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1.1 Benchmarking Practice and Procedures: Purpose, Goals and Objectives

1.1.1 Purpose

The purpose that Benchmarking serves is to provide City officials with a tool to assess the relative energy needs for City buildings. This practice will also provide guidance to City staff in order to monitor energy use and report, assess and recommend changes and improvements in daily practices and long term equipment repair and replacement. The Benchmarking tool is a way to measure their success as they implement energy efficiency measures and practices.

Benchmarking and use of Energy Star Portfolio Manager or other software provide an easy-to-use and cost-effective means for the City to establish a baseline. With a set of building energy ratings, city officials can cost-effectively enact energy efficiency measures where they are needed most.

While benchmarking and the use of Portfolio Manager are not new, they are new to the Coachella Valley. The innovative aspect of this proposal is the opportunity for Cathedral City to evaluate and test the effectiveness of energy benchmarking and then market use of these tools to other government agencies and businesses in the commercial and industrial sectors. Cathedral City will collaborate to develop the most effective and successful benchmarking policies and procedures. Through the Desert Cities Energy Partnership and the Green for Life Program, Cathedral City will truly lead by example.

Meeting the Requirements of California Law: AB 1103 – Nonresidential Building Benchmarking Law.

This law requires electric and gas utilities, on and after January 1, 2009, to maintain records of the energy consumption data of all nonresidential buildings to which they provide service, in a format compatible for uploading to the United States Environmental Protection Agency's Energy Star Portfolio Manager (Energy Star Portfolio Manager), for at least the most recent 12 months. An electric or gas utility is required, upon request, to upload all of the energy consumption data for a building to the Energy Star Portfolio Manager.

The law also requires, on and after January 1, 2012, that nonresidential building owners or operators disclose historical energy usage for their buildings using Energy Star Portfolio Manager benchmarking data and ratings, for the most recent 12-month period, to a prospective buyer, lessee, or lender. The information is considered adequate to inform the prospective buyer, lessee of the entire building, or lender that would finance the entire building, of the benchmarking data and ratings for the building.

Benchmarking energy performance helps to identify best practices that can be replicated, either within a building or across a portfolio of buildings. Benchmarks can be reference points for measuring and rewarding good performance. They allow an organization to identify top-performing facilities for recognition and to prioritize poorly performing facilities for immediate improvement.

To comply with California Law AB 1103, Energy Star Portfolio Manager can generate the following required documents:

- Statement of Energy Performance: Includes the building's Energy Use Index, characteristics, contact information, and if available, the building's Energy Performance Rating
- California Energy Performance Report: Customized report established by the California Energy Commission within U.S EPA Portfolio Manager containing all data necessary to generate a Statement of Energy Performance

This Practice will fulfill the following goals:

1. Leverage existing resources, including review and assessment of similar Benchmarking policies and programs of other jurisdictions in the Valley;
2. Evaluate whether current municipal policies and procedures support efficient energy performance;
3. Allow the City to work with other non-participating local governments and other agencies (other utilities, water districts) to encourage use of benchmarking.

1.1.2 Practice Objectives

The City is committed to long-term cultural change in respect to its use of, and attitudes about, energy. This program will provide long-term actions to reduce energy use, limit greenhouse gas emissions, promote sustainable energy practices, and make a positive impact in the Coachella Valley. The goal of the Green For Life Program is to integrate energy efficiency and climate action planning activities into the daily operations of local governments.

Benchmarking enables energy managers to determine the key metrics for assessing a building's performance, to establish baselines, and to set goals for energy performance. It also helps to identify building upgrade opportunities that can increase profitability by lowering energy and operating costs, and it facilitates continuous improvement by providing diagnostic measures to evaluate performance over time.

1.1.3 Eligible and Ineligible Facilities

Eligible Facilities: Buildings that are eligible and required for benchmarking are those that are owned or leased by the City of Cathedral City and for which Cathedral City directly pays the energy bills, and when leasing space to third parties, Cathedral City

shall be responsible for collecting utility bill information from the lessee (if billed separately). This Practice will apply to:

Buildings with areas greater than 5,000 ft²;

Ineligible Facilities: This Practice will not apply to buildings with less than 11 consecutive months of energy consumption data available.

1.1.4 Benchmarking Tool Approved for Program

EPA's Energy Star Portfolio Manager will be utilized as the benchmarking tool and can be accessed at the following web site:

www.energystar.gov/benchmark

By utilizing Portfolio Manager, the City will be in compliance with California Law AB 1103. Portfolio manager is supported by South California Edison (SCE) and can utilize SCE's Automated Benchmarking Services (ABS).

1.1.5 Timelines

The City of Cathedral City will establish an account in Portfolio Manager, establish a portfolio of all the eligible buildings, and conduct the initial benchmark for all the eligible buildings by January 1, 2013.

1.1.6 Frequency and Triggers for Ongoing Updates

Energy Star Portfolio Manager shall be updated automatically on a monthly basis using the utility's automated benchmarking system (ABS).

1.1.7 Reporting Requirements

Once data have been collected, the specific benchmarks are to be computed for the building. Goals may be established at the building or organizational level; the exact goal will depend on the objectives of the benchmarking project that were identified at the outset. The actual benchmarking data will transform these broader objectives into quantifiable goals.

Energy Star Portfolio Manager will rank the building and will generate an Energy Star rating of 0-100. Reports to be generated from the Portfolio Manager shall include:

- a. Statement of Energy Performance that will provide an absolute Score and the building Energy Utilization Index (EUI) in the units of kBtu/sq.ft./yr
- b. Comparison Report on similar types of buildings within in Cathedral City
- c. Comparison Report of all the Buildings within Jurisdiction that presents a ranking sorted by the Portfolio Manager score and the EUI
- d. Comparison Report of similar type buildings in USA to present how the buildings compare to similar types of buildings within the US.

- e. Building Trending Report that compare previous year's results for the same building (Trending).

Reporting of benchmarking scores shall occur prior to the start of major energy efficiency measure (EEM) implementation.

1.1.8 Process for Disclosure of Results

The City of Cathedral City will submit the results of the benchmarking process in the following methods:

Annual report to the City Manager or Mayor;

AND

Annual report to the Facility's Manager, Sustainability Manager, Energy Manager;

AND

Post results for easy access by building occupants and the community (building lobby, cafeteria, break room, city website, etc.)

1.1.9 Required Actions

This section presents a methodology for actions to be taken based on the Energy Star rating that result from the benchmarking process. The actions are triggered based on the scoring thresholds of the following:

- Top 25% of buildings (Score > 75)
- Top 51% – 26% of buildings (Score between 51 and 74)
- Lower 50% of buildings (Score < 51)

➤ **Score: Energy Star Rating greater than 75 or top quartile rating based on EUI**

For buildings that score in the top 25% or a score greater than 75, Cathedral City will take the following actions:

Promote the accomplishment through one or more of the following methods:

Sharing Best Practices with other cities and community stakeholders;

AND

Developing and sharing a Case Study addressing the energy efficiency characteristics of the building;

AND

Posting the accomplishment on the City's Web Site

➤ **Score: Energy Star Rating between 51 and 74 or second quartile rating based on EUI**

For buildings that score in the top 51% to 26% or a score between 51 and 74, Cathedral City will take the following actions:

Retro-commission the building according to RCx Practice and implement measures that have a simple payback of 2 years or less;

AND

Document actions taken;

AND

Estimate a new benchmark based on projected energy savings from new energy efficiency measures;

AND

Update the benchmark every 6 months for the next 2 years to track progress and verify savings

➤ **Score: Energy Star Rating less than 50 or bottom half (third and fourth quartile) rating based on EUI**

For buildings that score in the bottom 50% or a score less than 50, Cathedral City will take the following action:

Retro-commission the building according to RCx Practice and implement measures that have a simple payback of 3 years or less;

AND

Document actions taken;

AND

Estimate new benchmark based on projected energy savings;

AND

Update the benchmark every 3 months for the next 2 years to track progress and verify savings

1.1.10 Practice Enforcement

The City of Cathedral City will assign a Benchmark Administrator who will review monthly data to verify that utility data was updated and that the recommended practice has been followed.

1.2 Benchmarking Procedures

1.2.1 Purpose

This section of the Practice provides the guidelines to the procedures for benchmarking buildings as required in the benchmarking practice.

1.2.2 Program Initiation

1.2.2.1 Assign a Benchmark Administrator

The City of Cathedral City shall assign a Benchmark Administrator who will be the person responsible for conducting and/or overseeing the benchmarking process for Cathedral City.

1.2.2.2 Benchmark Training

The Benchmark Administrator shall be trained on using the EPA Portfolio Manager through one or more of the following:

- CVAG Green for Life Workshops
- SCE Benchmarking Workshops
- EPA Portfolio Manager Web Site

http://www.energystar.gov/ia/business/benchmarking_training/benchmarking.html)

1.2.2.3 Identify Buildings to be Benchmarked

The Benchmark Administrator or his/her designee shall develop an inventory of all the buildings owned and leased by Cathedral City. The inventory data shall include the following information for each building:

- Address
- Building Name or Description
- Building Area (ft²)
- Electric Meter(s)
 - Electric Service Provider
 - Electric Account Number (all accounts)
 - Electric Meter Number (all meters)
- Gas Meter(s)
 - Natural Gas Service Provider
 - Natural Gas Account Number (all accounts)
 - Natural Gas Meter Number (all meters)
- Facility Point of Contact

The facilities shall be sorted by building area. The buildings to be benchmarked shall be selected based on the schedule provided in Section 1.5.4, Timelines.

1.2.2.4 Establish an Account in Portfolio Manager

The Benchmarking Administrator or his/her designee shall log onto the Portfolio Manager web site, register an account and complete the registration including a user name, password, contact information, business description, and job title. When complete, the profile shall be saved.

1.2.2.5 Authorize Benchmark Administrator to Collect Energy Data

The benchmarking process requires the collection of historical energy billing information. The Benchmark Administrator or his/her designee will need access to the utility bills in the form of the actual hard copies of the bills or the utility's online access. If the Utility's Automated Benchmarking System is to be used for initial data population and/or monthly updates, the appropriate person within Cathedral City will need to sign the authorization form.

1.2.2.6 Authorize Benchmark Administrator to Collect Building-specific Data

The benchmarking process requires an understanding of building characteristics that will be input into the benchmarking tool. The Benchmark Administrator or his/her designee will need to have access to building information such as floor plans, mechanical plans, and occupancy schedules. For some space types, the Benchmark Administrator will need to have access to the facility to collect information on equipment in that building.

1.2.2.7 Authority to Send Benchmark Data Request Form to Tenants

If Cathedral City is leasing building space to a tenant who is responsible for their own energy bills (i.e. tenant has their own utility accounts that are metered separately), the Benchmark Administrator or his/her designee will need authorization to request the tenant's utility bill information.

1.2.3 Data Collection

1.2.3.1 General Facility Information

The general facility data required to be input into the tool are as follows:

- Type of Facility (select one of the following)
 - A single facility for which my organization owns or manages 90% or more of the floor area
 - A portion of a single facility for which my organization owns or manages less than 90% of the floor space
 - A hospital composed of a single facility or collection of facilities
 - A municipal wastewater treatment plant or water treatment and distribution utility
- Add this facility to a Campus (Yes/No)
- Country
- Facility Name
- Address

- City
- State
- ZIP Code
- Year Built
- Select Organization that owns this facility
 - Add new Organization name and contact information to allow sharing of information
- Is there an energy efficiency Service and Product Provider assisting with this building?
 - Add new Contact name and contact information to allow sharing of information. Indicate if this Contact is a Professional Engineer

1.2.3.2 Area by Space Use Type

In order to identify a building's group of peers, more than 50% of the building's gross floor area (excluding parking lots and garages) must be defined by one of the following space types:

- Bank/Financial Institution
- Courthouse
- Data Center
- Hotel
- Office
- Residence Hall/Dormitory
- Warehouse (refrigerated and non-refrigerated)
- Computer Data Center
- Multifamily Housing
- Other
- Parking
- Municipal Wastewater Treatment Plant
- Swimming Pool

The following space types within Portfolio Manager are subject to the following restrictions:

Parking:

The combined floor area of all enclosed and not enclosed parking structures cannot exceed the total gross floor area of the building (where the gross floor area of the building excludes the parking floor area).

Other:

The combined floor area of any space classified as “Other” (e.g. library, restaurant, cafeteria, etc.) cannot exceed 10% of the total gross floor area of the building (where gross floor area of the building excludes the parking floor area).

Multifamily Housing:

The combined floor area of all Multifamily Housing spaces cannot exceed 10% of the total gross floor area of the building (where the gross floor area of the building excludes the parking floor area).

Municipal Wastewater Treatment Plant:

If the building is a Municipal Wastewater Treatment plant it cannot be combined with any other space types.

1.2.3.3 Benchmark Tool Specific Information

The following buildings are those in Portfolio Manager that may be included in the types of buildings that are owned or leased by the City. This section provides a listing of the data required for each type of building being benchmarked.

Courthouse applies to facility space used for federal, state, or local courts and associated office space. The total gross floor area should include all supporting functions such as temporary holding cells, kitchens used by staff, lobbies, atria, conference rooms and auditoria, fitness areas for staff, storage areas, stairways, elevator shafts, etc. The following information is required for a Courthouse Space.

- Zip code
- Gross floor area
- Weekly operating hours
- Number of workers on main shift
- Number of personal computers
- Percent of gross floor area that is air conditioned
- Percent of gross floor area that is heated

Data Center applies to spaces specifically designed and equipped to meet the needs of high density computing equipment such as server racks, used for data storage and processing. Typically these facilities require dedicated uninterruptible power supplies and cooling systems. Data center functions may include traditional enterprise services, on-demand enterprise services, high performance computing, internet facilities, and/or hosting facilities. Often Data Centers are free standing, mission critical computing centers. When a data center is located within a larger building, it will usually have its own power and cooling systems. The Data Center space is intended for sophisticated computing and server functions; it should not be used to represent a server closet or computer training area. The total gross floor area is measured between the principal exterior surfaces of the enclosing fixed walls and includes all supporting functions for the data center. This should include the entire data center, which may have raised floor computing space, server rack aisles, storage silos, control console areas, battery rooms, mechanical rooms for cooling equipment, administrative office areas, elevator shafts, stairways, break rooms and restrooms. The following information is required for a Data Center Space.

- Zip code
- Gross floor area
- IT Energy Configuration (Location of IT Energy Meter)
- Annual IT Energy

Municipal Wastewater Treatment Plant A wastewater treatment plant is a facility that is designed to treat municipal wastewater. The level of treatment at a plant will vary based on the BOD limits and the specific processes involved. This space type in Portfolio Manager is appropriate for primary, secondary, and advanced treatment facilities with or without nutrient removal. Treatment processes may include biological, chemical, and physical treatment. This space type is best applied to wastewater treatment facilities of 150 MGD or smaller. This space type does not apply to water treatment and distribution facilities.

The following information is required for wastewater treatment facilities:

- Zip code
- Average influent flow
- Average influent biological oxygen demand (BOD5)
- Average effluent biological oxygen demand (BOD5)
- Plant design flow rate
- Presence of fixed film trickle filtration process
- Presence of nutrient removal process

Office applies to facility spaces used for general office, professional, and administrative purposes. The total gross floor area should include all supporting functions such as kitchens used by staff, lobbies, atria, conference rooms and auditoria, fitness areas for staff, storage areas, stairways, elevator shafts, etc. The following information is required for an Office Space.

- Zip code
- Gross floor area
- Weekly operating hours
- Number of workers on main shift
- Number of personal computers
- Percent of gross floor area that is air conditioned
- Percent of gross floor area that is heated

Warehouse (refrigerated and non-refrigerated) Warehouse applies to unrefrigerated or refrigerated buildings that are used to store goods, manufactured products, merchandise or raw materials. The total gross floor area of Refrigerated Warehouses should include all temperature-controlled areas designed to store perishable goods or merchandise under refrigeration at temperatures below 50 degrees Fahrenheit. The total gross floor area of Unrefrigerated Warehouses should include space designed to store non-perishable goods and merchandise. Unrefrigerated warehouses also include distribution centers. The total gross floor area of refrigerated and unrefrigerated

warehouses should include all supporting functions such as offices, lobbies, stairways, rest rooms, equipment storage areas, elevator shafts, etc. Existing atriums or areas with high ceilings should only include the base floor area that they occupy. The total gross floor area of refrigerated or unrefrigerated warehouse should not include outside loading bays or docks. Self-storage facilities, or facilities that rent individual storage units, are not eligible for a rating using the warehouse model.

The following information is required for Unrefrigerated Warehouse Spaces.

- Zip code
- Gross floor area
- Number of walk-in coolers and refrigerators
- Weekly operating hours
- Number of workers on main shift
- Percent of gross floor area that is air conditioned
- Percent of gross floor area that is heated

The following information is required for Refrigerated Warehouse Spaces.

- Zip code
- Gross floor area
- Weekly operating hours
- Number of workers on main shift

Municipal Wastewater Treatment applies to water distribution facilities designed to pump and distribute drinking water through a network of pipes. Depending on the water source (ground or surface) a water utility may or may not contain a treatment process. The space type in Portfolio Manager is appropriate for water treatment and distribution facilities with or without treatment, and may include ground surface, and/or purchased water sources.

The following information is required for Water Treatment and Distribution Utilities:

- Zip code
- Average flow

The following buildings that do not fall under the defined energy star space type can be assigned as "OTHER" and can be benchmarked. Spaces that do not fit clearly within any available categories should be designated as "other". Other may be used to designate any space not listed in Portfolio Manager; this could include restaurants, laboratories, penitentiaries, or manufacturing facilities. If an entire facility is classified as Other, it is not eligible to receive a National energy performance rating; however, if a portion of a facility is classified as Other, it may be able to receive a National energy performance rating. To be eligible, the gross floor area of the facility must be comprised of 50% or more of an eligible space type and 10% or less of the gross floor area must be comprised of an Other space type.

The following information is required for Other Spaces.

- Gross floor area
- Weekly operating hours

The space types listed as “Other” are listed below.

- Education
 - College/University (campus-level)
- Food Sales
 - Convenience Store (with or without gas station)
 - Food Service
 - Restaurant/Cafeteria
 - Fast Food
- Health Care
 - Inpatient (Specialty Hospitals, excluding Children’s)
 - Clinic/Other Outpatient Health
- Public Assembly
 - Entertainment/Culture
 - Library
 - Recreation
 - Social/Meeting
- Lodging
- Mall (Strip Mall and Enclosed)
- Public Order and Safety
 - Fire Station/Police Station
- Service
 - Vehicle Repair/Service
 - Postal Service
- Storage/Shipping
 - Self-Storage
 - Distribution/Shipping Center
- Retail
 - Vehicle Dealerships
- Other
 - Airplane hangers,
 - Laboratories
 - Crematoriums

1.2.4 Entering Utility Meter Data

Utility meters are modeled in the benchmarking tool by entering the following meter information:

- Meter Name
 - SCE meter naming convention is open to the user to use any name
 - SCG meter naming convention is to use the 10 digit account number
- Area of Facility Served by the Meter
- Meter Type
 - Energy Type
 - Units
- Is this meter currently active?

The utility meter data can be entered into Portfolio Manager either manually or through an automated benchmarking system (ABS).

Manual Meter Data Entry

When adding meters into the Portfolio Manager at the “Select Number of Meter Entries to be added and Start Date for first entry” screen, populate the fields for ***Meter Entries to Add (Months)*** and ***Start Date (MM/DD/YYYY)***, then select ***Continue***. The screen will refresh with a table where the monthly Energy Use and Cost can be entered from the copies of the facility energy bills. When all the data is entered in the table, select ***Save***.

Automated Benchmarking System (ABS)

The steps required to configure the Portfolio Manager for SCE’s Automated Benchmarking System is as follows:

- Create Portfolio Manager account, building spaces and meters
- Input Meter Name based on user’s preference
- From the “My Portfolio” page select link to “Automated Benchmarking Services Console”
- Electric Meters:
 - Select SCE as your Energy Service Provider
 - The following customer inputs are required:
 - Customer Account Number
 - Authentication Key
 - Customer Email
 - For AB1103 (yes or no)
 - Electric meter Service Account Number
- For additional support:
 - www.sce.com/business/energy-solutions/portfoliomanager.htm
- Natural Gas Meters:
 - Meter Name must be the 10 digit account number in the Meter
 - From the “My Portfolio” page select link to “Automated Benchmarking Services Console”

- Select SoCal Gas as your
- The following customer inputs are required
 - 10-digit Account Number
 - 8-digit Meter Number associated with above-referenced Account Number
 - Building’s 5-digit zip code
- For additional support:
 - www.socalgas.com/business/benchmarking/

Once the ABS systems are configured, data will be uploaded into the portfolio in approximately 24 hours.

1.2.5 Proof of Compliance

Once the Benchmarking is complete, the Benchmarking Administrator or his/her designee shall generate the “Statement of Energy Performance” report. This report shall serve as evidence of the Benchmarking as well as provide backup information to validate the accuracy of the input data. When generating the Statement of Performance Report, the Administrator will select the following report options:

- Statement of Energy Performance (summarizes benchmarking results)
- Energy Star Data Checklist (summarizes property’s physical and operating characteristics, as well as total energy consumption)
- Facility Summary

The Benchmark Administrator or his/her designee shall collect and archive the Statement of Energy Performance Reports and associated backup data to support inputs.

The data quality shall be validated by sampling the Statement of Energy Performance Reports and associated backup data to check that the values used in the Benchmarking tool are true and accurate.

1.2.6 Analysis

The Portfolio Manager allows users to generate 8 different reports for any building in the portfolio. These reports can be shared within the organization or other stakeholders in various file formats (xls, pdf, csv, xml). The standard Reports are as follows:

- Baseline Comparison
- Benchmark Performance
- Current Facility Status
- Emissions Performance
- Energy Performance
- Utility Cost Reports
- Water Performance Report
- Wastewater Energy Performance

Portfolio Manager Customized Reports

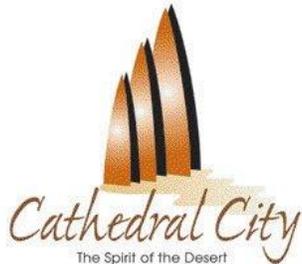
- Allows users to create Customized Report templates from the Portfolio Manager metrics
- Enables users to share their customized report with other users via a URL and customized instructional text
- Can be used for utility energy efficiency programs or other mandated program for improved energy efficiency at the state or local level
- Users can edit templates shared with them and upload and share data

The Benchmark Administrator shall generate reports that address the following:

- a. Absolute Scores (Score and EUI)
- b. Compare Similar Types of Buildings in Jurisdiction
- c. Compare and Rank All Buildings within Jurisdiction
- d. Compare Similar Types of Buildings in USA
- e. Compare Previous Years for the Same Building (Trending)
- f. California Energy Performance Report

Commissioning and Retro-Commissioning Practice

for



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1. Commissioning and Retro-Commissioning (Cx/RCx) Practice Purpose and Objectives

1.1 Purpose

Commissioning is the process of assuring that new buildings operate at peak efficiency. Retro-Commissioning (Cx/RCx) is the process of tuning-up an existing building in order to ensure proper operation of major equipment, proper indoor air quality, desired occupant comfort, and optimum energy consumption of existing equipment.

Retro-commissioning is a process that seeks to improve how building equipment and systems function together. Depending on the age of the building, retro-commissioning can often resolve problems that occurred during design or construction, or address problems that have developed throughout the building's life. In all, retro-commissioning improves a building's operations and maintenance (O&M) procedures to enhance overall building performance.

The Commissioning and Retro-commissioning process is referred to as Cx/RCx in this document.

The Cx/RCx process consists of the following elements:

- Planning Phase
- Cx/RCx Service Provider Selection
- Baseline Requirements
- Project Boundaries
- Investigation Phase
- Savings and Economic Analysis
- Implementation Phase
- Functional Performance Testing Phase
- Facility Manager and Operator Training
- Project Reporting
- Measurement and Verification Phase

1.2 Practice Objectives

The Cx/RCx Practice is a key component in the Green for Life program. The Cx/RCx Practice tiers off the City's Benchmarking Practice, which addresses the benchmarking of buildings and the tracking of energy usage through the City's Utility Manager Software system. The three parts of the program – benchmarking, utility management software and retro-commissioning -- identify energy savings and cost cutting opportunities.

2. Commissioning and Retro-commissioning Practice

2.1 Eligible and Exempt Facilities

Buildings that are eligible for commissioning or retro-commissioning under this Practice are all City-owned buildings that have occupancy factors greater than 50%;

Buildings that are exempt from this commissioning or retro-commissioning Practice are:

Buildings where the City is not directly responsible for the energy bills;

AND

City Leased Buildings where the landlord is responsible for the operation and maintenance of the heating and cooling systems

2.2 Timeline

Eligible facilities should be retro-commissioned in accordance with the requirements as presented herein.

2.3 Frequency and Triggers

Eligible facilities should execute the Cx/RCx Process when a trigger based on the score or energy use intensity from the EPA Portfolio Manager is determined during the Benchmarking process. The triggers are defined in the Benchmarking Policy.

2.4 Cx/RCx Project Manager

The City Manager should appoint a Cx/RCx Project Manager who will be the person responsible for conducting and/or overseeing the Cx/RCx process for the City. The City's Cx/RCx Project Manager will be responsible for managing appropriate City staff that are supporting the Cx/RCx process, managing vendors and contractors, managing budgets and managing the schedule.

2.5 Cx/RCx Process

The Cx/RCx Practice should be executed through the following Cx/RCx process.

2.5.1 Cx/RCx Service Provider Selection

The City Cx/RCx Project Manager will be responsible for overseeing the selection of a Cx/RCx Service Provider to carry out the Cx/RCx Process. The selection process and the minimum requirements for a Cx/RCx Service Provider are as follows.

- Experience and up-to-date technical knowledge in the related fields of design, construction, and operation of buildings and building systems.
- Extensive and recent hands-on field experience in all aspects of the Cx/RCx process that include:
 - Energy auditing
 - Energy savings modeling
 - Equipment operation trending
 - HVAC controls

- HVAC design

The Cx/RCx Service Provider may be an in-house employee or a person/company that the City contracts with for the work.

The level of experience and required certification and registration that the City should require of an Cx/RCx Service Provider are as follows:

Minimum of 5 years of Cx/RCx experience;

AND

A Professional Engineer (P.E.) registered in the State of California

Cx/RCx Service Provider Selection Guideline

The Cx/RCx Service Provider may be a third party service provider or In-house Personnel.

2.5.2 Planning Phase

During the Planning Phase, the City should select a Cx/RCx Service Provider. The Cx/RCx Service provider should evaluate the energy usage patterns of the facility, document current operating conditions of major equipment, perform an initial site walk-through, and meet with the facilities management staff. The Cx/RCx Service Provider should identify eligible project incentive programs through utility providers, local government partnerships, low cost financing, on-bill financing, and/or grants.

The Cx/RCx plan should include an audit of the entire facility and an analysis of utility bills. The Cx/RCx Service Provider should develop a Cx/RCx Plan, which will include:

General building information;

AND

Facility Energy Consumption Information;

AND

Description of Major Systems;

AND

Execution Plan

2.5.3 Baseline Requirements

The Cx/RCx Service Provider should establish a baseline of energy utilization of the facility. The acceptable method of establishing the project baseline is with an average of the most recent 36 months.

It is anticipated that the source of the data will be the energy usage data in Portfolio Manager, updated through the benchmarking process, or the data archived in the Utility Manager Software system.

2.5.4 Project Boundaries

The boundaries of the Cx/RCx Process that are covered by this Practice define the systems that are to be addressed. The boundary as defined by this Practice should be:

Packaged Heating and Cooling Systems;
AND
Lighting and Lighting Control Systems;
AND
Building Control Systems;
AND
Air Distribution Systems – Including ducting and diffusers;
AND
Hydronic Distribution Systems

The approach for Cx/RCx with the defined boundary should at a minimum be prescriptive on Targeted Major Systems.

2.5.5 Investigation Phase

The requirements for the Investigation Phase of the Cx/RCx process should include:

Equipment lists, with nameplate information;
AND
Drawings for the building’s main energy consuming systems and equipment including controls, mechanical, and electrical;
AND
Equipment operational trending

The Cx/RCx Service Provider should perform diagnostic monitoring to gather data on when and how the systems operate. Diagnostic monitoring should identify, characterize and confirm improvement opportunities as well as begin to detect the root cause of performance deficiencies. The Cx/RCx Service Provider should use handheld meters, data loggers, and/or the building management system (BMS) to observe the building’s operation and maintenance.

For the prescriptive approach, the investigation should consist of evaluating the identified systems using a checklist. The following provides an example of this approach:

- Packaged Rooftop Air Conditioning Units (Direct Expansion):
 - Check if filters are clean
 - Check if Cooling and Heating Coils are clean
 - Check if fan belt is properly installed and is in good condition
 - Check if Economizer control is properly functioning
 - Check if Condenser Coils are clean
 - Are the compressors properly functioning
 - Check if it is scheduled properly
- Air Handling Units
 - Check if filters are clean
 - Check if Cooling and Heating Coils are clean
 - Check if fan belt is properly installed is in good condition
 - Check if Economizer control is properly functioning
 - Check if sensors are functioning properly and calibrated
 - Check if it is scheduled properly

- Pumps
 - Check if there is any audible cavitation
 - Check flow rate if it is functioning properly
 - Check motor speed if it is spinning in the correct direction
 - If the pump has a variable speed drive, is the drive controlling the motor properly
 - Are all gauges functioning properly and calibrated
 - Check if it is scheduled properly
- Exhaust Fans
 - Check if the fan belt is in good condition
 - Check if the fan belt is aligned properly
 - Check if the fan belt is properly adjusted and tightened
 - Check if it is scheduled properly
- Lighting Systems
 - Check if the lighting fixture is clean
 - Check if all lamps are properly installed
 - Verify correct sensor placement and orientation
 - If applicable, check if the sensors are properly functioning
 - Check if the lighting systems are scheduled properly
- Control Systems
 - Validate Temperature Setpoints
 - Validate and Optimize HVAC schedule
 - Sensor Values

2.5.6 Savings and Economic Analysis

The requirements for the savings calculation methods and tools as well as the required form of the economic metrics used to make decisions related to the proposed measures to be implemented should include:

Description of the recommended improvement;
 AND
 Identification of applicable utility incentives;
 AND
 Estimated energy savings and installed costs;
 AND
 Simple payback for the improvement;
 AND
 Recommendations and status of implementation

The calculation of energy savings must be certified by a PE or CEM.

A Master List of Findings should be developed to document deficiencies identified from the investigation phase, including the “field fixes” made during the course of the investigation.

After the Master List of Findings is complete, the Cx/RCx Service Provider should present the results to the City Cx/RCx Project Manager and should recommend the measures for implementation. Depending on the City needs and scope of the project, the Master List of Findings may be a sufficient decision-making tool to proceed to implementation, as it provides a summary of the investigation findings, recommended solutions, and a cost-benefit analysis. The City may wish to have the Master List of Findings included in an Interim or Investigation Summary Report in which the commissioning team details their findings from the site assessment, building documentation review, and diagnostic trending and testing. The City should require the team to supply all calculations and assumptions behind their energy savings and cost estimates.

2.5.7 Implementation Phase

The selection and implementation of the improvements and energy efficiency measures should be made by the Cx/RCx Project Manager. Each project should be documented to include a scope of work, installed cost, incentives from an outside program, and energy savings.

The Cx/RCx Project Manager should select cost effective projects for implementation that have a simple payback of 2 years or less.

The options for the City to implement the selected measures are:

- Use in-house staff;
- AND/OR
- City contracts with a third party

2.5.8 Functional Performance Testing Phase

Functional Performance Testing should be conducted for systems addressed in the Cx/RCx Process:

Testing Protocols

The Cx/RCx Service Provider should perform Functional Performance Testing on the building's systems based a protocol from Portland Energy Conservation (PECI).

Testing Procedures

The Cx/RCx Service Provider and the City should schedule the testing and make any necessary preparations, such as checking and calibrating control points or temperature sensors. Functional performance tests may be conducted during normal business hours as long as occupants are not affected.

The Cx/RCx Service Provider should conduct functional performance tests on equipment operation based on defined modes. The functional tests should consist of forcing the system into the defined operating modes, validating system operation.

The Cx/RCx Service Provider should record all project activities and observations on a pre-defined data sheet, and then ensure that all systems are returned to a "normal" state. Each system should be operated as found in operating mode (i.e. work with current conditions).

2.5.9 Facility Training Phase

The Cx/RCx service provider should provide training on system changes to the people who are responsible for continued operation and savings after the project is complete. The training element provides staff with the best opportunity to learn about how issues were identified and remedied as well as the new sequence of operation of major systems that have been implemented. Training sessions should be provided in the form of one-day training at the end of the project.

The format of the training should be:

- Hands-on demonstrations on the affected equipment;
- AND
- A Power Point presentation overview

2.5.10 Project Reporting

The Cx/RCx Service Provider should provide the project deliverables for the different phases of the Cx/RCx Process to ensure that the City Project Manager has a clear understanding of the status of the project.

At a minimum, the Cx/RCx Service Provider should provide a Systems Manual and Final Report. Both of these documents shall form the basis of the content in the Facility Training Phase above. The minimum content for each of these reports are as follows:

Systems Manual:

- Project Executive Summary;
- General building or plant description;
- Building and equipment schedules;
- Equipment list with descriptions;
- Sequences of Operation;
- M&V Plan

Final Report:

- Executive Summary;
- The Master List of Findings, with a description of the improvements implemented;
- Updated estimates of savings and the actual improvement costs for each improvement implemented;
- All completed functional tests and results;
- Complete documentation of revised or new strategies implemented including set points and operating schedules;

2.5.11 Measurement and Verification (M&V) Phase

Once an implementation project is completed, the Cx/RCx Service Provider should monitor the equipment or systems to ensure that the improvements are working as expected. The M&V task can be accomplished using Building Management System trending, data logging, functional testing, simple observation, whole building tracking through the Utility Manager Software system, or a combination of these methods.

Cx/RCx Service Provider should verify savings with the use of the Utility Management Software.