

The crux of the problem does not lie with the General Services Department, as it has not been given the resources nor the mandate to effectively manage our energy programs. Reducing energy usage in City buildings has never been included in the greening LA priorities set by our elected leadership.

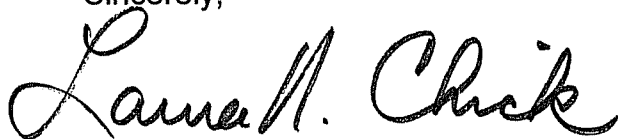
Government can set the tone by establishing standards for new green buildings, but shouldn't we also act as a role model with buildings we already own? Shouldn't we along with saving energy also always be interested in saving money, such as lower electricity bills?

While General Services was required to report quarterly to the City Council on its energy conservation efforts, only one status report has been given in the last seven years. Further, there are no tracking measures in place to be able to clearly report to the public if these dollars were well spent and that this is the best we can be doing. In fact, energy usage and costs have actually increased in nine out of the ten buildings we surveyed that had been retrofitted with new light bulbs.

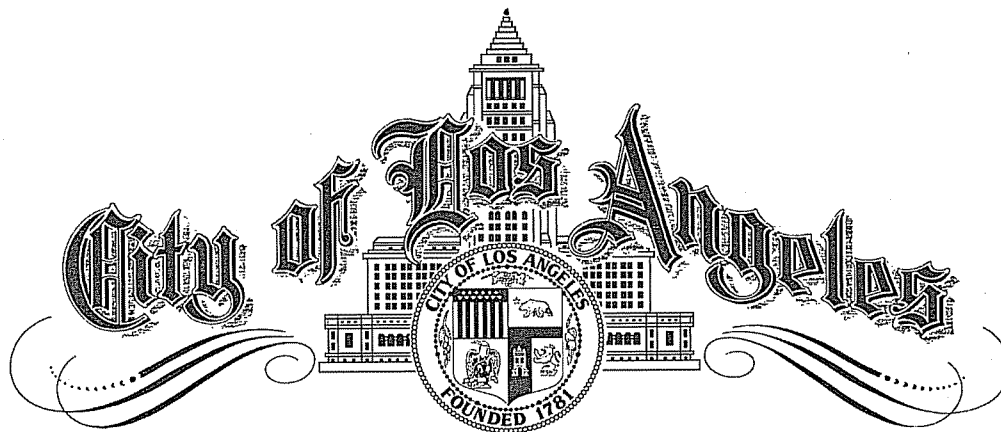
It's rather astounding that LADWP, which provides expert technical and financial advice for all its retail customers, isn't in lock step with General Services and the rest of the City advising and guiding. Instead, their only role has been to watch that their money is paid back, and that the City is charged between 4.52% and 6.18% interest.

Clearly, this program needs a complete overhaul. The Mayor and City Council need to decide if they want to make energy conservation a priority as part of our greening LA efforts.

Sincerely,

A handwritten signature in black ink that reads "Laura N. Chick". The signature is written in a cursive, flowing style.

LAURA N. CHICK
City Controller



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June 3, 2008

Tony M. Royster, Interim General Manager
General Services Department
111 E. First Street, Room 701
Los Angeles, CA 90012

Dear Mr. Royster:

Enclosed is a report entitled "Audit of Energy Conservation Measures in the City." A draft of this report was provided to you on May 23, 2008. Comments provided by your Department at the meeting held on May 28, 2008, were evaluated and considered prior to finalizing the report.

Please review the final report and advise the Controller's Office by July 3, 2008 of actions taken to implement the recommendations. If you have any questions or comments, please contact me at (213) 978-7392.

Sincerely,

A handwritten signature in black ink, appearing to read 'Farid Saffar'.

FARID SAFFAR, CPA
Director of Auditing

Enclosure

cc: Robin Kramer, Chief of Staff, Office of the Mayor
Jimmy Blackman, Deputy Chief of Staff, Office of the Mayor
Ray Ciranna, Acting City Administrative Officer
Karen E. Kalfayan, City Clerk
Gerry F. Miller, Chief Legislative Analyst
Sally Choi, Deputy Mayor, Office of the Mayor
Independent City Auditors



City of Los Angeles Office of the Controller

Audit of Energy Conservation Measures in the City

June 3, 2008

Laura N. Chick
City Controller

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AUDIT OF ENERGY CONSERVATION MEASURES IN THE CITY

EXECUTIVE SUMMARY

BACKGROUND

Excluding the proprietary departments, the City of Los Angeles owns over 1,000 buildings, largely comprised of police stations, fire stations, libraries, office buildings, park facilities, sanitation plants and maintenance facilities. Electricity to operate these facilities exceeded \$20 million in fiscal year (FY) 1995-96 and increased to nearly \$27 million in FY 2006-07. In an attempt to reduce its energy consumption at City facilities, in 1996, the Council authorized the General Services Department (GSD or the Department) to enter into performance guarantee contracts with four Energy Services Companies (ESCOs) to perform energy audits of City facilities and to implement energy saving measures in the facilities. The ESCOs installed energy conservation measures at 15 facilities and reported \$83,000 in annual energy savings or approximately 755,000 kilowatt hours (KWH).

To further the conservation program, in February 2001, the Council approved a Memorandum of Understanding (MOU) between the Department of Water and Power (DWP) and the City for GSD to obtain \$10 million in energy efficiency loans from DWP to implement an Energy Conservation Program (Program). Under this loan program, GSD has completed installing energy conservation measures in 87 buildings (excluding the 15 completed by the ESCOs). The project cost to date for completed efficiency projects is \$6.2 million. The Department has repaid \$3.5 million of the borrowed amount back to the DWP leaving an outstanding loan balance of \$2.7 million. Since \$6.2 million has been borrowed so far, there is \$3.8 million left of the \$10 million loan that can be used for future projects. GSD primarily implemented lighting retrofits, energy management systems, variable frequency drivers and carbon dioxide sensors into the 87 City buildings and facilities. GSD estimates annual energy savings of \$1.5 million or approximately 16.2 million KWH.

The primary objective of this audit was to evaluate the energy conservation efforts in the City. Since GSD manages one of the largest programs, the Energy Conservation Program, our review focused on this Program.

SCOPE

The audit was performed in accordance with Generally Accepted Government Auditing Standards and covered the projects completed since the inception of the Program to March 2008. Fieldwork was conducted between January 2008 and May 2008.

In conducting our audit, we interviewed management and staff involved with the Energy Conservation Program to obtain an understanding of the GSD's policies and practices relating to selection, implementation and management of retrofit projects. We also contracted with Northstar Consulting to survey other U.S. municipalities to identify leading practices employed by the municipalities relating to energy conservation. We then evaluated the GSD's program against leading practices. This audit focused primarily on the Energy Conservation Program managed by GSD and did not include other energy conservation programs or projects undertaken by other city departments.

SUMMARY OF AUDIT RESULTS

Our audit found that, with respect to energy conservation measures within buildings under its purview, GSD is focusing on projects that generate the most savings. However, our audit found that there is no one City department with oversight, responsibility, and accountability for coordinating energy conservation measures to ensure a successful Citywide implementation. The success of such efforts requires constant monitoring and reinvesting project savings into future projects.

This audit also found that the City does not maximize the services available from the DWP. The DWP is the energy expert in the City of Los Angeles. DWP's Budget, Rates and Conservation Division is responsible for providing technical and financial assistance in energy efficiency matters for all of its retail customers and has developed professional competencies and technical capabilities that may not be available within other city departments. The City and GSD needs to maximize the services DWP can offer to adequately manage a successful citywide energy conservation program.

In addition, we found that GSD has not properly planned for its Energy Conservation Program and that there is a general lack of project management over the Program. Further, the retrofit projects are being done by maintenance staff, on a part-time basis, supplemented by hiring hall staff, as needed. Our key findings are discussed below.

We also identified, and included as an attachment, several best practices that may enable the City to implement a successful program.

KEY FINDINGS

- **There is no one City department/agency with overall oversight and accountability for coordinating energy conservation measures installed by various city departments.**

Apart from GSD's Energy Conservation Program, the Los Angeles Convention Center, Recreation and Parks, and the three proprietary departments have other energy conservation initiatives that they are pursuing. Additionally, the Bureau of Engineering (BOE) is responsible for ensuring that all renovations and new city buildings are designed with energy efficient products.

GSD is responsible only for retrofitting buildings covered by its Program. Other than this, it is not responsible for any other conservation efforts, such as issuing policies and procedures to departments on energy conservation measures. As a result, departments are left mostly on their own to develop policies and procedures for energy conservation.

- **GSD does not have the staffing resources or skills to effectively design and implement Energy Conservation Programs.**

Energy efficiency implementation requires project management similar to any other capital projects the City is undertaking. Projects require planning, staffing, scheduling, funding, oversight, and implementation. The Energy Conservation Program is being managed by a group within the Department's Maintenance Division which does not have the necessary staffing resources or skills to effectively design and support a Citywide energy conservation program.

- **GSD has not developed a comprehensive implementation plan or goals and objectives for the Program.**

Since the inception of GSD's Energy Conservation Program in 2001, an overall implementation plan has not been developed. Prior to signing the MOU, GSD did not make an assessment regarding whether the \$10 million loan amount would be sufficient to fund the Program. There are still no goals and objectives for the Program that address the timeliness of project completions, number of projects to be completed, and the estimated energy and dollar savings to be achieved.

- **GSD could not demonstrate how it determines the priority of buildings to be retrofitted.**

The Department indicated that buildings are selected based on energy bills, age of the building, incentive opportunities, and the size of the building. However, GSD could not demonstrate how it utilized these criteria to determine the priority of buildings to be retrofitted. We noted several projects with large savings that were completed well after other projects that had much smaller savings.

- In addition, one project, the renovation of GSD's Piper Tech facility, has utilized 40% of the total amount borrowed to date but generated only 21% of total reported estimated savings from the Program. This project cost \$2.5 million and had an estimated payback period of 8.4 years. Since the typical lighting project has a payback period of three to six years, GSD could have spent the \$2.5 million on more lighting projects that would have maximized energy savings and reduced pay back periods. GSD stated that this project was one of the earlier projects that it completed, and from this project it learned that focusing solely on lighting projects would maximize energy

savings. However, with better planning (discussed above), the Department could have known this before it initiated the Piper Tech project.

- **Inadequate oversight over the Energy Conservation Loan Program Fund has resulted in a large balance of \$980,000 accumulating in the Fund. Most of these monies should be transferred to the General Fund.**

GSD created a special revenue fund, the Energy Conservation Loan Program Fund, to account for loan disbursements received from DWP and to pay for the cost of energy efficiency projects. We noted that since the inception of the Program in 2001, labor costs paid by the General Fund have only been reimbursed once (for \$155,000) by the Energy Conservation Loan Program Fund, which has contributed to the high balance in the fund.

Monies can also accumulate in the Fund if GSD overestimates its project costs. GSD does not periodically reconcile estimated to actual costs to determine if it needs to adjust its methodology for estimating costs.

- **GSD has only completed energy savings measures in 102 of its inventory of 958 buildings. The Department has made limited use of Energy Service Companies which could be utilized to maximize energy savings.**

GSD performs the vast majority of energy savings projects in-house. Due to its limited staffing resources that have been assigned to the Program, the Department has only been able to complete energy saving measures in only 11% of its inventory of 958 buildings, despite the Program being in existence for almost seven years.

The initial intent of the Program was to use Energy Service Companies (ESCOs) to perform all projects. GSD should make more use of ESCOs to maximize savings by implementing energy savings measures in more buildings.

GSD stated that one reason more ESCOs have not been used is that they would be more expensive to use than using in-house and hiring hall staff. However, it has never performed a formal cost analysis. The Department indicated that it has been unable to make more use of hiring hall staff because of the lack of staffing resources to manage the projects.

However, even if ESCOs are more expensive, GSD should increase the use of ESCOs because it is unable to complete more projects using in-house and hiring hall staff. In other words, using ESCOs would be better than not pursuing projects at all.

- **GSD does not have adequate documentation to support its \$1.5 million annual estimated savings (approximately 16.2 million KWH).**

GSD utilizes utility bills to calculate actual estimated savings for its completed projects. However, we were unable to verify the reasonableness of the Department's calculations because GSD does not maintain reliable project completion dates.

We noted that energy usage and costs have both increased for nine of ten buildings we analyzed. However, neither we nor GSD was able to determine whether this is because of longer work hours, previously vacant floors now being used, additional employees, etc.

At the Mayor's request, in December 2007, DWP completed a study in which it evaluated 475 GSD maintained buildings for potential energy savings measures. DWP estimates that the City could realize \$6 million in annual savings (approximately 55 million KWH) once all the measures have been implemented. GSD's preliminary cost estimate for completing the projects is \$38 million.

Before the City invests \$38 million in additional energy savings measures it may want to consider requiring an independent analysis of GSD's estimated costs and its assumptions to estimate project savings to help ensure the City will realize the \$6 million in annual savings. For example, it may be possible to separately meter the actual installed energy savings measure (as opposed to metering the entire building) under controlled circumstances so that the true savings can be determined accurately.

- **GSD did not apply for all available rebates to reduce the loan repayment amount to DWP. The Department may have potentially lost approximately \$100,000 in rebates.**

DWP offers cash rebates to business customers for qualifying energy-efficient lighting products that reduce peak load consumption. GSD did not submit rebate offers for 48 of its 87 completed projects. The Department has potentially lost \$100,000 in rebates due to non submittals and late submittals of rebate applications.

REVIEW OF REPORT

A draft report was provided to GSD on May 23, 2008. We discussed the contents of the report with GSD management on May 28, 2008. The Department generally concurred with the audit's recommendations, but believes that several recommendations may be difficult to implement with its current staffing resources. We considered the Department's comments before finalizing this report. We would like to thank GSD management and staff for their cooperation and assistance during the audit.

TABLE OF RECOMMENDATIONS

| RECOMMENDATIONS | PAGE REFERENCE |
|---|----------------|
| <p>1. The Mayor and Council should designate a central oversight department/agency that would be responsible for coordinating Citywide conservation measures. This department's responsibilities should include:</p> <ul style="list-style-type: none"> a) Setting goals and objectives for Energy Conservation Programs. b) Ensuring that adequate funding and resources exist. c) Issuing Citywide policies and procedures, and monitoring for compliance with procedures. d) Measuring actual performance, including energy savings and costs, against established goals. e) Identifying and implementing successful energy saving best practices, such as light-emitting diode (LED) Exit Sign Retrofits, LED Traffic Signals and street lighting technologies. f) Reporting outcome measures to the Mayor and Council on a periodic basis. | 16 |
| <p>2. The Mayor and Council should ensure that proper resources and expertise are available to effectively manage and implement the Energy Conservation Program, and ensure DWP's expertise is utilized.</p> | 18 |
| <p>3. GSD management should develop an implementation plan for the energy conservation program which includes goals and objectives for the Program and how costs and energy savings should be measured.</p> | 19 |
| <p>4. GSD management should develop appropriate management reports to monitor the progress of the energy conservation program and periodically submit them to Council and the appropriate committees.</p> | 19 |
| <p>5. GSD management should develop a formal risk assessment methodology to prioritize the order of buildings to be retrofitted for lighting replacements.</p> | 22 |
| <p>6. GSD management should identify labor costs incurred since the Program's inception and transfer this amount from the Energy Conservation Loan Program Fund to the General Fund.</p> | 23 |

| RECOMMENDATIONS | PAGE REFERENCE |
|--|----------------|
| 7. GSD management should develop a process to periodically transfer funds from the Energy Conservation Loan Program Fund to the General Fund to reimburse the General Fund for labor costs. | 23 |
| 8. GSD management should develop procedures to periodically compare estimated costs to actual costs to assess whether the methodology to estimate costs needs to be adjusted. | 23 |
| 9. GSD management should develop a spending plan for any monies remaining in the Energy Conservation Loan Program Fund after all transfers to the General Fund have been made. | 23 |
| 10. GSD management should develop a plan to make more use of Energy Services Companies, hiring hall staff, and other resources, to increase the number of completed energy projects. | 25 |
| 11. GSD management should assess the cost effectiveness of utilizing Performance Guarantee contracts. If it is determined that they are not cost effective, GSD should request Council's approval to modify its agreement with DWP to exclude the performance guarantee provision from its agreement with DWP. | 25 |
| 12. GSD management should maintain accurate records of project completion dates and documentation to show that it has used correct months from utility bills to calculate estimated actual energy savings. | 27 |
| 13. GSD management should periodically compare estimated savings per the technical proposals to actual estimated savings per utility bills and use the results to evaluate whether its assumptions for estimating costs need to be adjusted. | 27 |
| 14. City Council and the Mayor's office should consider requiring an independent analysis of GSD's assumptions to estimate project savings. | 27 |
| 15. GSD management should develop procedures to perform post-inspections of completed projects, at least on a sample basis, to ensure the continued existence of installed equipment and its proper operation and maintenance. | 28 |
| 16. GSD management should work with the Environmental Affairs Department to explore and research other grant opportunities to fund energy efficiency projects. | 31 |

| RECOMMENDATIONS | PAGE REFERENCE |
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| 17. GSD management should explore the feasibility of applying for rebates on the remaining completed projects. | 31 |
| 18. GSD management should establish procedures to ensure rebates are pursued for all eligible projects. | 31 |

BACKGROUND AND METHODOLOGY

BACKGROUND

Excluding the proprietary departments, the City of Los Angeles owns over 1,000 buildings, largely comprised of police stations, fire stations, park facilities, sanitation plants, libraries, office buildings and maintenance facilities. Electricity to operate these facilities exceeded \$20 million in fiscal year (FY) 1995-96 and increased to nearly \$27 million in FY 2006-07 (see table 1 below).

Table 1
Electricity Expenses for City Facilities

| Fiscal Year | GSD | Sanitation | Street Services | Library | Recreation & Parks | Total |
|--------------------|--------------|-------------------|------------------------|----------------|-------------------------------|--------------|
| FY 1995-96 | \$11,026,119 | \$386,676 | \$499,944 | \$1,678,475 | \$6,855,446 | \$20,446,660 |
| FY 1996-97 | \$11,803,598 | \$421,826 | \$509,206 | \$1,992,389 | \$6,879,283 | \$21,606,302 |
| FY 1997-98 | \$12,921,031 | \$458,368 | \$644,245 | \$2,212,119 | \$7,220,246 | \$23,456,009 |
| FY 1998-99 | \$12,368,008 | \$393,172 | \$569,889 | \$1,980,586 | \$6,914,985 | \$22,226,640 |
| FY 1999-00 | \$12,445,420 | \$414,913 | \$690,375 | \$2,166,955 | \$7,394,867 | \$23,112,530 |
| FY 2000-01 | \$12,704,489 | \$367,553 | \$656,875 | \$2,097,571 | \$7,532,559 | \$23,359,047 |
| FY 2001-02 | \$14,258,601 | \$380,121 | \$663,841 | \$2,054,075 | \$7,238,454 | \$24,595,092 |
| FY 2002-03 | \$13,596,516 | \$340,668 | \$609,104 | \$2,113,052 | \$7,542,027 | \$24,201,367 |
| FY 2003-04 | \$14,595,253 | \$440,661 | \$692,762 | \$2,415,544 | \$7,525,693 | \$25,669,913 |
| FY 2004-05 | \$14,133,700 | \$458,710 | \$554,513 | \$2,626,455 | \$7,184,395 | \$24,957,773 |
| FY 2005-06 | \$14,679,018 | \$410,258 | \$547,435 | \$2,562,367 | \$7,536,100 | \$25,735,178 |
| FY 2006-07 | \$15,194,805 | \$423,472 | \$562,196 | \$2,608,650 | \$8,066,623 | \$26,855,746 |

Source: GSD - Water and Electricity Fund Expenditures

According to GSD's records, the square footage for GSD maintained buildings increased 21% since fiscal year 2003-04 from 16 million square feet to 19.4 million square feet due to new or expanded buildings. The increase in energy costs due to these additions/expansions cannot be easily quantified. However, we noted that the new and/or remodeled libraries and fire stations tend to consume more energy due to

their larger size. For example, annual energy consumed by five libraries (El Sereno, Canoga Park, Ascot, Hyde Park and Fairfax) completed over the last several years increased by approximately 153%, from 395,000 KWH to 1 million KWH. This translates to approximately an \$82,000 increase in annual energy costs or approximately 745,000 KWH.

In an attempt to reduce the cost of water and electricity, the City Council, in 1996, authorized the GSD to enter into agreements with Energy Services Companies (ESCO) to conduct energy audits and for the ESCOs to implement energy conservation measures necessary to achieve maximum energy and dollar savings. The program was designed to be a performance guaranteed and shared savings contract, with no up-front cost to the City.

Phase I

In 1997, GSD contracted with four Energy Services Companies (ESCOs) to identify any retrofit projects that could generate energy savings. GSD entered into performance guarantee contracts with CH2MHILL, Viron Energy, KDC and Sempra Energy Solutions. The firms were to be paid, with interest, from savings generated from the measures. The ESCOs identified 15 facilities and installed energy conservation measures into the facilities. GSD reported these 15 projects are generating a total of \$83,000 in annual energy savings (approximately 755,000 KWH). GSD paid the ESCOs \$764,000 for the 15 projects. GSD and many involved with the energy conservation program refer to this period of activity and the utilization of ESCOs for project implementation as Phase I.

Phase II

In May 1999, the Department of Water and Power (DWP) was authorized to issue up to \$10 million in energy efficiency loans to the City. Financing for the program was authorized through the DWP's Energy Conservation Loan Program established by Ordinance No. 172606. The Mayor and Council also authorized DWP to partner with the GSD to implement energy conservation measures at City facilities. Mayor and Council authority was needed in order to allow GSD to accept the loans and perform the work.

In February 2001, the City Administrative Officer (CAO) reported to the City Council's Commerce, Energy and Natural Resources Committee on the status of the joint GSD and DWP Loan Program. The status report's highlights included statements that DWP had already qualified and pre-selected a number of energy services companies to perform the work, that GSD requested authority to execute performance guarantee contracts with these ESCOs, that performance contracts would include a "guaranteed savings" provision, and that GSD required additional staff to manage the retrofit program.

On March 5, 2001, the Council adopted a motion to approve a Memorandum of Understanding (MOU) between DWP and GSD was adopted by the Council. The approval included all provisions and recommendations contained in the CAO's status report summarized above, and a number of additional provisions including reporting the criteria for selecting and evaluating projects and quarterly progress reporting. The Energy Conservation Loan Program Fund (Fund 45E) was also established for the receipt, retention and disbursement of monies borrowed or received by the City from DWP for the purchase of and installation of energy efficiency measures in City buildings and facilities.

To date, GSD has completed installing energy conservation measures in 102 buildings since the inception of the Program. This includes the Phase I, ESCO effort that addressed 15 facilities. The combined project cost to date for energy efficiency projects implemented in Phase II is \$6.2 million. The Department has repaid \$3.5 million of the borrowed amount back to the DWP leaving an outstanding loan balance of \$2.7 million. Since \$6.2 million has been borrowed so far, there is \$3.8 million left of the \$10 million loan that can be used for future projects.

Energy Conservation Loan Program Fund (Fund 45E)

GSD established an interest bearing special revenue fund, the Energy Conservation Loan Program Fund (Fund 45E), to account for the receipt, retention and disbursement of funds received from DWP to purchase and install energy efficiency measures. All interest and other earnings, including energy rebates and incentives attributable to money in the fund are credited to the Fund. Expenditures paid out of the Fund are required to be authorized by the General Manager or his designee.

Loan Payment

The City's utility bills are paid out of the Water and Electricity Fund (Fund No. 100/60 within the City's General Fund). A sub-account entitled "Energy Conservation Payments," is used for loan payments (principal and interest) to DWP. Loan rates varied from project to project and ranged from 4.52% to 6.18%. Although the savings generated from measures implemented are supposed to be used to pay the loans, the City is obligated to pay the loans even when measures do not generate savings that are equivalent to the loan amounts. As of March 2008, the total outstanding loan balance was \$2.7 million.

Organization

The Energy Conservation Program, the focus of our review, is managed by GSD's Building Maintenance Division. The Maintenance Division is primarily responsible for the repair and maintenance of plumbing, heating, electrical, and air conditioning systems, in city buildings. The in-house retrofit projects that were

completed under the Program were done by five staff assigned to the Central Shop Unit of the Building Maintenance Division, on a part-time basis. These staff are supplemented by hiring hall staff, as needed.

Other Conservation Programs

Apart from GSD's Energy Conservation Program, other city departments, including the three proprietary departments have other energy conservation initiatives that they are pursuing. For example, the Los Angeles Convention Center (LACC) recently executed a loan agreement with the DWP for energy efficiency projects. Also, the Bureau of Street Lighting has a pilot program, where it is currently testing recent technologies involving the use of solar power and LED lamps for street lights. Our review did not include these other programs.

OBJECTIVES, SCOPE AND METHODOLOGY

The primary audit objective was to determine whether the City is meeting its goals and objectives for energy efficiency and reducing energy consumption for its buildings and facilities. The specific objectives of the audit included an evaluation of the following:

1. Whether the energy efficiency and conservation measures in place are generating savings for the City in the form of reduced energy usage.
2. Whether the expenses paid out of the Energy Conservation Loan Program Fund are for the purchase and installation of energy efficiency measures in City buildings and facilities, and whether the funds are being maximized to achieve the City's desired energy efficiency goals and environmentally friendly projects.
3. Whether there is proper oversight over City-wide efforts to implement energy efficiency and conservation measures.
4. Whether existing practices are comparable to best practices implemented by other cities.
5. Whether GSD provides periodic reports to Council on the progress of the Program.

The audit was performed in accordance with Generally Accepted Government Auditing Standards and covered the projects completed since the inception of the Program through March 2008. Fieldwork was conducted between January 2008 and May 2008.

In conducting our audit, we interviewed GSD's management and staff involved with the Energy Conservation Program to obtain an understanding of the GSD's policies and practices relating to the selection and implementation of retrofit projects. We evaluated the retrofit projects completed at 10 sampled locations and reviewed sample expenditure transactions to determine whether loan receipts were used to pay for eligible expenses.

We also contracted with Northstar Consulting to survey other U.S. municipalities to identify best practices employed by the municipalities relating to energy conservation programs (Table 2 below). We then evaluated GSD's Program against these best practices. The summary of the best practices can be found in **Appendix II**.

| Table 2 | |
|--|--|
| Survey Participants | |
| <ul style="list-style-type: none"> • Albuquerque, NM • Austin, TX • Las Vegas, NV • Little Rock, AR • Phoenix, AZ | <ul style="list-style-type: none"> • Riverside, CA • Sacramento, CA • San Francisco, CA • San Jose, CA • University of Nevada - Las Vegas |

This audit focused primarily on the energy conservation program managed by GSD and did not include an evaluation of other energy conservation programs or efforts undertaken by other city departments. For example, the audit did not include a review of the proprietary departments or Recreation and Parks.

The remainder of this report details our findings, comments and recommendations.

AUDIT FINDINGS AND RECOMMENDATIONS

SECTION I: CITYWIDE OVERSIGHT AND PROGRAM PLANNING

Energy efficiency (or conservation) is only one component to managing a city's energy needs. In order to manage energy effectively, the function requires overall management as well. The survey participants with the most effective energy efficiency programs aggressively manage their entire energy programs. The advantages of managing an energy program include accountability, authority, and performance measurement.

Citywide Oversight

Finding #1: There is no one City department/agency with overall oversight and accountability for coordinating energy conservation measures installed by various city departments.

Best practices show that, to ensure coordinated efforts and accountability, a central oversight body with responsibility and authority for monitoring energy conservation efforts for the City as whole is necessary. However, we found that the City does not have one department/agency responsible for overall energy conservation efforts. Apart from GSD's Program, the Los Angeles Convention Center, Recreation and Parks, and the three proprietary departments have other energy conservation initiatives that they are pursuing. For example, the Los Angeles Convention Center (LACC) recently executed a loan agreement with the DWP for energy efficiency projects. However, since LACC buildings are not included in GSD's Program, GSD was unaware of the energy efficiency measures being installed at LACC.

The Bureau of Engineering (BOE) is responsible for ensuring that all renovations and new city buildings are designed with energy efficient products, and GSD has no involvement in the process. The City has established a "LEED Certified Certification" standard for all new city buildings and the BOE is responsible for monitoring to ensure that all new city constructions achieve this standard.

GSD is responsible only for installing retrofits in buildings covered by its Program. Other than this, it is not responsible for any other conservation efforts, such as issuing policies and procedures to departments on energy conservation measures. The Department stated that there is no charter requirement making them responsible for Citywide conservation measures.

We noted documents that both contradict and support GSD's position. For example, in 1996, the Council authorized GSD to release a Request for Qualifications (RFQ) for energy conservation services for all City Departments, including all independent and proprietary departments (CF 95-1644). This could be interpreted to mean that GSD's Program would cover all departments including proprietary departments. Executive Directive No. 2001-24, dated January 18, 2001, also directed GSD to work with DWP to immediately implement the Energy Service Company (ESCO) Program. The directive further states that under this program, City facilities would be comprehensively evaluated for energy saving ideas and strategies.

In 2001, the Mayor issued a directive to departments to conserve energy. GSD stated that this is an indication that each department is responsible for implementing measures to conserve energy. On July 18, 2007, the Mayor's Office issued another Executive Directive, Sustainable Practices in the City of Los Angeles. The directive described the Mayor's vision to transform the city into the cleanest and greenest big city in the Country and directed all city departments to guide the private sector's decision-making process for planning, construction and renovation of buildings in the city.

The directive required departments to adopt plans to, among others, guide their staff on ways to reduce water and energy usage to the maximum extent feasible. The departments are required to submit their annual sustainability report, which should detail their efforts and achievements in the previous fiscal year in reaching sustainability goals and adopting best management practices. It is unclear whether the Mayor's office plans to provide central oversight and monitoring of departments on energy conservation programs either separately and/or as part of this green initiative.

We recognize the complexity involved in having GSD monitor energy usage and conservation of all city departments. Operational changes are the least controllable and most difficult to implement by necessitating building managers (e.g. GSD) to control and monitor how building occupants (other departments) use the facilities. However, in order to ensure continued success in energy efficiency gains, an organization must develop operational procedures that ensure future energy efficiency gains. If GSD does not have the expertise and/or the authority to provide necessary oversight, the City must place the responsibility in another city department.

It should be noted that GSD recently posted large signs in various lobbies that provide employees with tips for conserving energy in the workplace (e.g., shutting down computers at the end of the day, turning off conference room lights when not in use, etc.). This is a step in the right direction, but without more education, formal policies, frequent reminders, and periodic monitoring, the savings are likely to be only a small percentage of potential savings. For example, since lighting constitutes a large portion of the City's electric bills, the City probably should have formal policies with respect to turning off lights at the end of the workday (e.g., who should be responsible for ensuring they are turned off). Unnecessary lights may be left on because employees believe that someone else (janitors, building managers, etc.) will turn them off or because they believe they should be left on for safety reasons.

Recommendation

The Mayor and Council should:

- 1. Designate a central oversight department/agency that would be responsible for coordinating Citywide conservation measures. This department's responsibilities should include:**
 - a) Setting goals and objectives for Energy Conservation Programs.**
 - b) Ensuring that adequate funding and resources exist.**
 - c) Issuing Citywide policies and procedures, and monitoring for compliance with procedures.**
 - d) Measuring actual performance, including energy savings and costs, against established goals.**
 - e) Identifying and implementing successful energy saving best practices, such as light-emitting diode (LED) Exit Sign Retrofits, LED Traffic Signals and street lighting technologies.**
 - f) Reporting outcome measures to the Mayor and Council on a periodic basis.**

Finding #2: GSD does not have the staffing resources or skills to effectively design and implement an Energy Conservation Program.

Best practices show that in order to effectively manage a successful conservation program, necessary management expertise should be acquired. Energy efficiency implementation requires project management similar to any other capital projects the City is undertaking. Projects require planning, staffing, scheduling, funding, oversight, and implementation. By treating energy efficiency with the same standards, energy efficiency becomes a component of a Department's or Division's performance.

GSD does not have the staffing resources or skills to effectively design and implement an Energy Conservation Program for buildings under its purview. GSD's organization chart for the Maintenance Division does not reflect personnel with project development and management skills to design develop and monitor project progress, costs and completion. The retrofits completed under the Program are done by five employees within the Division, on a part-time basis, supplemented by hiring hall staff, as needed.

Our survey shows successful leading energy efficiency programs are supported by staff with effective project management skills including the following:

- **Demonstrated knowledge of project management techniques and tools.**
 - **Planning.**
 - **Staffing.**

- Scheduling.
 - Budgeting.
 - Contracting.
 - Quality Control.
 - Performance.
- Capabilities consistent with energy efficient programs.
- Knowledge of energy efficiency technologies.
 - Knowledge of utility rates and costs.
 - Knowledge of facility operations and maintenance.

The lack of project management skills is evident in how the Program and projects are managed. For example, as discussed later in the report, there are no goals and objectives established for the Program, the Department cannot show how it prioritizes projects to be completed, there is inadequate oversight over the Energy Conservation Loan Program Fund, and estimated costs and savings are not reconciled with actual figures.

Although, the memorandum of understanding (MOU) between the GSD and DWP calls for DWP to provide technical management assistance to the City upon written request, our interviews with DWP energy efficiency personnel indicated GSD has never requested assistance and that:

- DWP is not involved with projects in terms of project selection, cost, schedule or savings, but does review proposed payback periods based upon their understanding of the MOU.¹
- DWP does not analyze project costs as proposed or upon completion. Proposals submitted to DWP contain minimal detail.
- DWP engineering staff reportedly reviews the technical proposals but there is no analytical product of this effort available.
- DWP performs post implementations inspection only if rebates are incorporated in projects but indicated that rebate applications were not submitted for all projects, even though all projects generally qualify for rebates (discussed in Finding 10).

GSD does not appear to be maximizing the services available from the DWP. The DWP is the energy expert in the City of Los Angeles. DWP's Budget, Rates and Conservation Division is responsible for providing technical and financial assistance in

¹ A simplified form of cost/benefit analysis is called simple payback period. This calculation determines the amount of time it will take to return the value of the investment. It is calculated by dividing the total cost of the improvement by the annual energy cost savings produced by the improvement to arrive at the number of years required for the improvement to pay for itself.

energy efficiency matters for all of its retail customers and has developed professional staff and technical capabilities that are not found within other city departments. The City and GSD needs to maximize the services DWP can offer the City. Without necessary expertise and support resources, it is difficult for GSD to adequately manage a successful citywide energy conservation program. It should be noted that GSD has identified project management skills necessary for the program in past budget requests but has not yet been approved for these positions.

Recommendation

- 2. The Mayor and Council should ensure that proper resources and expertise are available to effectively manage and implement the Energy Conservation Program, and ensure DWP's expertise is utilized.**

Finding #3: GSD has not developed a comprehensive implementation plan or goals and objectives for the Program.

Strategic planning defines the overall direction where an organization is going over the next year or more, how it will get there, and how will it know whether it has been successful. Since the inception of GSD's Program in 2001, an overall implementation plan has not been developed. Prior to signing the MOU, GSD did not make an assessment regarding whether the \$10 million loan amount would be sufficient to implement the Program.

The MOU does outline basic parameters of the Program, such as the responsibilities of the City and DWP and required documentation to obtain a loan for a specific project. However, GSD has never developed a formal implementation plan, including goals and objectives for the Program. The plan could include how projects would be selected and how savings would be measured. The goals and objectives could address the number of projects completed each year, the estimated savings to be achieved, and the timeliness of completed projects.

Because goals and objectives for the Program have not been established, GSD has never evaluated the success of the Program. When the Program was approved in 2001, the Council required that GSD and DWP report to the Commerce, Energy and Natural Resources Committee, the Information Technology and General Services Committee and the Council on a quarterly basis on the progress of the Energy Conservation Program. The Department has not provided the required quarterly reports. The Department did provide one report to the Commerce, Energy and Natural Resources Committee in June 2003 that contained some elements that we would expect in a progress report.

Recommendations

GSD management should:

- 3. Develop an implementation plan for the energy conservation program which includes goals and objectives for the program and how costs and energy savings should be measured.**
- 4. Develop appropriate management reports to monitor the progress of the energy conservation program and periodically submit them to Council and the appropriate committees.**

SECTION II: PROJECT SELECTION & MANAGEMENT

Selection of which energy efficiency projects to fund should be an informed decision based on budget commitments, energy goals, and knowledge of energy use (end-use). An “end-use” is the ultimate application for which a product has been designed. Electric energy has numerous end-uses depending on the type of customer. The California Energy Commission recognizes thirteen end-uses for commercial customers. Table 3 shows the percentage contribution of each end-use toward total energy consumption for a typical office building. Three end-uses, lighting, office equipment, and heating, ventilation and air-conditioning (HVAC), represent nearly ninety percent of the total energy consumed in a typical building.

Table 3
Percentage of Energy Use for a Typical Large Office Building
By End-Use

| End-Use | Percentage |
|--|-------------------|
| Lighting | 30 |
| Interior | 26 |
| Exterior | 4 |
| HVAC | 40 |
| Ventilation | 17 |
| Cooling | 22 |
| Heating | 1 |
| Miscellaneous (Miscellaneous, Process, Air Compressors, Cooking, and Warehouse End-Uses) | 5 |
| Office Equipment | 19 |
| Motors | 4 |
| Refrigeration | 2 |

Source: California Energy Commission 2005 Commercial End-Use Survey for Southern California Edison Service Territory

Our survey of other municipalities revealed that within a building, lighting projects have the shortest payback periods and generate the most savings. The payback period is the amount of time it will take to recover the value of an investment. It is calculated by dividing the total cost of the investment by the annual energy cost savings to arrive at the number of years required for the improvement to pay for itself. For example, if a project that cost \$100,000 results in \$20,000 in annual savings, the payback period is five years (i.e., \$100,000 divided by \$20,000).

Lighting projects involve changing incandescent bulbs to compact fluorescent bulbs and replacing T12 fluorescent bulbs and lamp fixtures with more efficient T8 lamps/fixtures. T8 lamps are approximately 25% to 30% more efficient than T12 lamps.² The typical payback period is three years (excluding labor costs) when replacing T12 lamps/fixtures with T8 lamps/fixtures.

Finding #4:GSD could not demonstrate how it determines the priority of buildings to be retrofitted. In addition, two projects that were completed or proposed were non-lighting projects. The Department could not demonstrate why these projects were selected.

Since the Program's inception in 2001, GSD has completed 87 projects (excluding the 15 projects completed by Energy Service Companies). Of these, 84 (97%) were solely lighting projects. The Department indicated that buildings are selected based on energy bills, age of the building, incentive opportunities, and size of the building. However, GSD could not demonstrate how it utilized these criteria to determine the priority of buildings to be retrofitted. For example, it does not have spreadsheets that assign point values (weightings) to each of the criteria and calculates a "score". In reviewing the Department's spreadsheets of completed projects, we noted several projects with large savings that were completed well after other projects that had much smaller savings. For example, the City Personnel building retrofit project with projected annual savings of approximately \$173,000 and a payback period of one year was completed in September 2006 after 56 other projects that generated much less annual savings and had longer payback periods had been completed.

Following are two examples of projects that GSD completed or proposed that were not solely lighting projects. GSD was not able to show how these projects were selected:

- Piper Tech – In December 2004, GSD submitted a proposal to DPW to retrofit its Piper Tech facility. The project cost approximately \$2.5 million (40% of the total loan amount received to date) and was projected to have a 8.4 year payback period. One element of the project was an energy management system that cost \$548,273 and showed a projected payback of 13.5 years. GSD reported that this project is generating approximately 21% of total estimated savings from the Program. Since lighting projects have a much shorter payback period, GSD could have used the \$2.5 million to complete more lighting projects that would have maximized energy savings and reduced pay back periods.

² Linear fluorescent lamps are specified by diameter size in 1/8ths of an inch. "T" represents the tubular shape of the lamp. A T8 lamp is a 1-inch diameter lamp and a T12 lamp is a 1.5-inch diameter lamp. T8 fluorescent lamps with electronic ballast are the current standard for new fixtures and retrofits in commercial office buildings, schools, and industrial lighting.

GSD stated that this project was one of the earlier projects that it completed, and from this project it learned that focusing solely on lighting projects would maximize energy savings. However, with better planning (discussed in Finding #3), the Department could have known this before it initiated the Piper Tech project.

- Replacing desktop monitors - In November 2007, GSD submitted a proposal requesting \$225,000 to purchase 917 Liquid Crystal Display (LCD) monitors to replace the Department's Cathode Ray Tube (CRT) monitors. GSD estimated the project would generate a total of \$63,620 in annual energy savings (approximately 580,000 KWH) and would have a payback period of 3.5 years. According to DWP, the savings estimated by GSD was vastly overstated. DWP estimated the savings would be only approximately \$20,000 annually (approximately 180,000 KWH) which is equivalent to a payback period of 11.25 years. Because of the longer payback period, the DWP denied the proposal. GSD could not explain why this project was pursued, considering that most previous projects had focused primarily on lighting.

Recommendation

- 5. GSD management should develop a formal risk assessment methodology to prioritize the order of buildings to be retrofitted for lighting replacements.**

Finding #5: Inadequate oversight over the Energy Conservation Loan Program Fund has resulted in a large balance of \$980,000 accumulating in the Fund. Most of these monies should be transferred to the General Fund.

A special fund, the Energy Conservation Loan Program Fund (45E), was created to account for loan disbursements received from DWP to pay for the cost of energy efficiency projects. To request a loan, GSD submits a technical proposal to DWP for an individual project or for a batch of projects. Each technical proposal includes the estimated project cost (labor and material) and the estimated savings. Upon approval of the technical proposal, DWP transfers an amount equal to the estimated costs into Fund 45E. Expenditures related to approved projects are paid from the Fund.

If GSD accurately estimates costs on the technical proposals, the balance in the Energy Conservation Loan Program Fund should be close to zero. The only monies in the fund should be interest income plus any funds deposited into the account for projects that have not yet been completed. However, as of February 2008, the account balance in the fund was \$980,000, even though there was only one project in progress. This project had an estimated cost of \$10,000.

One reason for the large balance in the fund is that, since the inception of the Program, labor costs have been charged against the fund only once. The Department agrees that labor costs should be reimbursed to the General Fund, however, the Maintenance Division has never coordinated with the Accounting Division to develop a process to consistently make transfers from 45E to the General Fund to reimburse the General Fund for labor costs.

Excess funds could also accumulate in the fund if GSD overestimates its costs on technical proposals. However, GSD does not periodically compare estimated costs to actual costs. Such a comparison would allow GSD management to assess whether its methodology for estimating costs needs to be adjusted. GSD stated that although information is available to make the comparison, it has lacked the staff to accumulate the data.

Recommendations

GSD management should:

- 6. Identify labor costs incurred since the program's inception and transfer this amount from the Energy Conservation Loan Program Fund to the General Fund.**
- 7. Develop a process to periodically transfer funds from the Energy Conservation Loan Program Fund to the General Fund to reimburse the General Fund for labor costs.**
- 8. Develop procedures to periodically compare estimated costs to actual costs to assess whether the methodology to estimate costs needs to be adjusted.**
- 9. Develop a spending plan for any monies remaining in the Energy Conservation Loan Program Fund after all transfers to the General Fund have been made.**

Finding #6: GSD has only completed energy savings measures in 102 of its inventory of 958 buildings. The Department has made limited use of Energy Service Companies which could be utilized to maximize energy savings.

Phase I

As noted earlier, in 1997, GSD contracted with four Energy Services Companies (ESCOs) to identify any retrofit projects that could generate energy savings. Based upon the master contracts used in Phase I, the ESCOs submitted proposals for energy conservation measures and were required to guarantee the energy performance of equipment and systems which would in turn reduce operating costs and cover the cost

of the facility improvements over a period of years. The ESCOs would provide all funding for each project including analysis, engineering, equipment purchase, installation, training and monitoring. The ESCOs would be paid based on actual realized savings. Therefore, if the systems installed cost was greater than anticipated or the actual energy savings were less than anticipated, the ESCOs would be paid over a longer period of time. The “performance guarantee” provision of these contracts was not enforced. The ESCOs utilized in Phase I, were paid \$764,000 for the projects upon their completion and only a limited verification of savings (a three-month period following implementation) was performed.

Phase II

The MOU (Loan Master Agreement) between the DWP and the City for the City’s energy efficiency retrofits states, in part, “whereas the LA City will use the funds to hire ESCOs who will implement energy efficiency retrofit projects in City buildings and facilities; and whereas, LA City will serve as Project Manager for the energy efficiency retrofit implementation for the LA City buildings and facilities.” In March 2002, the City Council authorized GSD to execute contracts with energy services companies, utilizing the performance guarantee contract terms (CF 01-0223). The technical proposals must show savings which can offset the loan amount and become the basis of a performance guarantee contract. Each performance contract would be subject to City Attorney review and approval.

The Department did not follow the provision to hire ESCOs in Phase II either. GSD routinely uses a master agreement for projects of this nature with payment based upon time and materials instead of a performance guarantee contract. Also, for most projects, GSD decided to use in-house staff to complete the retrofit work.

We reviewed ten energy efficiency projects selected out of 87 total projects completed and noted that:

- Seven of the ten projects selected were performed using solely GSD resources.
- Two contractors performed the remaining three projects. Only one project contract (for the Piper Tech facility) had a performance guarantee clause.

We inquired from GSD why it did not use ESCOs for all the projects as required by the MOU, GSD indicated that it decided to do most projects in-house because of City Charter, Section 1022.³ GSD also stated that there are numerous hiring hall staff that can be used to complete additional projects. However, it has been unable to make more use of hiring hall staff because of the lack of staffing resources to manage the projects. GSD has been reluctant to make more use of ESCOs because they are more expensive than using in-house and hiring hall staff. In addition, they would still require some project management.

³ Charter Section 1022 requires that all city departments use city employees to perform work that can be performed cost effectively by city employees.

GSD has never performed a formal cost analysis to compare the cost of using ESCOs to the cost of using in-house and hiring hall staff. However, even if ESCOs are more expensive, GSD should increase the use of ESCOs because it is unable to complete more projects using in-house and hiring hall staff. In other words, using ESCOs would be better than not pursuing projects at all.

With respect to performance guarantee contracts, GSD indicated that it discontinued their use because of their complexity. If the Department had problems with performance guarantee contracts in Phase I, it should have communicated its concerns to appropriate City officials before the provision was incorporated into the MOU with DWP. With respect to the use of in-house staff, because of its lack of staffing resources, GSD should have utilized ESCOs to maximize available funding to retrofit more facilities and achieve additional savings.

Recommendations

GSD management should:

- 10. Develop a plan to make more use of Energy Services Companies, hiring hall staff, and other resources, to increase the number of completed energy projects.**
- 11. Assess the cost effectiveness of utilizing Performance Guarantee contracts. If it is determined that they are not cost effective, GSD should request Council's approval to modify its agreement with DWP to exclude the performance guarantee provision from its agreement with DWP.**

Finding #7: GSD does not have adequate documentation to support its \$1.5 million annual estimated savings.

Measurement of energy savings is not an exact science. Even though energy savings measures are installed (such as lighting retrofits), utility bills may not reflect a reduction for reasons such as:

- Changes in weather may result in increased heating or cooling costs that are unrelated to the energy savings measures installed.
- Building users may be working more hours.
- Floors or areas that were once vacant may now be occupied.
- Building users may bring in their own equipment such as portable heaters or fans.

For each project it initiates, GSD indicates the estimated annual energy savings on the technical proposal submitted to DWP. Based on our research, GSD is using a standard acceptable methodology for estimating the savings.

Once the project has been completed, GSD reviews utility bills to calculate actual estimated savings. For example, if a project was completed in March 2008, GSD would calculate estimated actual savings by comparing the April 2008 utility bill with the April 2007 utility bill. The savings are then entered into a spreadsheet database. The figures in the database are used for internal purposes to estimate the savings from the Program.

The above approach appears reasonable. However, we noted two problems. First of all, we were unable to verify whether GSD is using the correct months to make the comparison. For example, for six projects, we compared the project completion date entered into the database to the project completion date shown in a Task Order System maintained by GSD. For five of the projects there was at least a three month difference between the two dates. Furthermore, usually neither of the completion dates for the projects corresponded to the month that GSD used to calculate actual savings. For example for the Standards Laboratory project, the database showed a completion date of January 2007 and the Task Order System showed a completion date of March 2007. For this project, GSD used a completion date of December 2006 to calculate the actual estimated savings.

The second problem is that GSD does not make any comparisons of estimated savings per the technical proposals to actual estimated savings per the utility bills. Such a comparison would identify whether GSD needs to re-evaluate its assumptions. For example, wide disparities in estimated savings between the two sources could indicate that GSD's estimates of the number of hours that the lights will be in operation are inaccurate.

Based on figures in its spreadsheet, GSD estimated annual energy savings of 16.2 million kilowatt hours, which translated to approximately \$1.5 million. However, per Table 1 (shown in the background section), the utility bills show that electricity costs for GSD maintained buildings increased by \$500,000 from FY 2005-06 to FY 2006-07. The increase could be attributable to inaccurate assumptions, to new or expanded buildings, or to a variety of other factors. Table 4 below shows an overall increase of 7.6% in energy consumption by City facilities in FY 2006-07 compared to FY 2004-05.

Table 4

**Citywide Facilities Energy Consumption
excluding Proprietary departments (in KWH)**

| Fiscal Year | Total | % Increase Over Prior Year |
|--------------------|--------------|---------------------------------------|
| FY 2004-05 | 226,888,845 | |
| FY 2005-06 | 233,956,164 | 3.1% |
| FY 2006-07 | 244,143,145 | 4.4% |

Source: Department of Water and Power

At the Mayor's request, in December 2007, DWP completed a study in which it evaluated 475 GSD maintained buildings for potential energy savings measures. DWP estimates that the City could realize \$6 million in annual savings (approximately 55 million KWH) once all the measures have been implemented. GSD's preliminary cost estimate for completing the projects is \$38 million.

Before the City invests \$38 million in additional energy savings measures it may want to consider requiring an independent analysis of GSD's estimated costs and its assumptions when estimating project savings. For example, it may be possible to separately meter the actual installed energy savings measure (as opposed to metering the entire building) under controlled circumstances so that the true savings can be determined accurately.

Recommendations

- 12. GSD management should maintain accurate records of project completion dates and documentation to show that it has used correct months from utility bills to calculate estimated actual energy savings.**
- 13. GSD management should periodically compare estimated savings per the technical proposals to actual estimated savings per utility bills and use the results to evaluate whether its assumptions for estimating costs need to be adjusted.**
- 14. The Mayor and City Council should consider requiring an independent analysis of GSD's assumptions to estimate project savings.**

Finding #8: GSD does not conduct post-inspections of completed projects to verify that savings are still being achieved.

GSD performs a one-time review of electricity bills shortly after the project has been completed to determine estimated savings. However, GSD does not conduct post-

inspections of completed projects or review subsequent electricity bills to determine whether savings continue to exist.

According to energy efficiency industry standards prescribed by the International Performance Measurement and Verification Protocol (IPMVP), post retrofit inspections should be performed on a periodic basis to verify the continued existence of the equipment and its proper operation and maintenance. We reviewed FY 2007-08 KWH usages at ten retrofitted facilities completed between 2004 and 2007, and noted that the KWH used by nine of ten (90%) facilities has increased when compared to the pre-retrofit level. For example, City Hall East consumed approximately 1.7 million KWH a month before the retrofit was completed in May 2003. City Hall East usage went down to 1.68 million KWH after the retrofit but now consumes approximately 2.1 million KWH. Also, City Hall Parking consumed 1.9 million KWH before the retrofit in February 2006, went down to 1.8 million KWH right after the retrofit but now consumes approximately 2.1 million KWH. This means that energy savings originally projected were either not achieved or they were not maintained.

As acknowledged earlier, the loss of previous identified efficiency gains could be due to a number of reasons including a change in the operating environment or failure of original equipment installed. If GSD had performed post retrofit inspections at these facilities and reviewed subsequent electricity bills, the Department could have investigated the reasons why original projected savings were not maintained.

Recommendation

- 15. GSD management should develop procedures to perform post-inspections of completed projects, at least on a sample basis, to ensure the continued existence of installed equipment and its proper operation and maintenance.**

SECTION III: PROJECT FUNDING

Funding

Funding was reported to be a primary concern for every participant in our survey. The most successful participants are those that have recognized that energy efficient technologies offer real and sustainable results by lowering operating costs. The obstacle to funding then becomes the mechanics of how to capture and re-invest savings in future projects to make the program self-sustaining. When a re-investment mechanism exists, the competition for General Funds or reliance on loans diminishes. Our study identified the following best practices:

➤ **Establish an Energy Efficiency Account**

Establishment of a dedicated fund for energy efficiency programs promotes an energy efficiency program from a number of perspectives including:

- Identification of current funding capacity.
- Tracking of expenses.
- Correlation of progress versus cost.
- Allocation of funds to energy efficiency projects only.

This fund serves as a reminder that funds need to be expended, progress needs to be made, and future funding will be required. Although the City has a separate energy efficiency account, since funding and costs are not properly tracked (**finding #5**), the fund is not being managed to promote efficiency of the program.

➤ **Adjust the Budget Process to Re-invest Savings**

Traditionally, municipal budgets are developed utilizing the previous years' operating expenses. Often, operating cost for energy is reduced due to energy efficiency but the savings are not identified or quantified and the available funds are redirected to other areas. Successful municipalities re-invest savings by rigorously calculating savings for each facility and allocating the savings to an energy efficiency account. These savings are then used to fund future projects, pay back loans, and/or execute contracts.

➤ **Utilize Low Interest Loans**

The California Energy Commission and the Texas Public Utility Commission both offer their municipalities low interest energy efficiency implementation loans. These loans are repaid in a manner similar to performance contracts, in that a percentage of the savings is applied to the loan repayment. The GSD loan program with DWP operates similarly.

➤ **Utilize Rebates**

Municipalities in California that receive service from investor-owned utilities are eligible to receive funds in the form of rebates from their utilities (DWP has a similar program) for the installation of approved energy efficiency technologies. Not only do these rebates serve to reduce the payback time, they can be deposited into an energy efficiency account to fund future projects. We found, as discussed below in **finding #10**, that GSD does not fully take advantage of DWP rebates.

➤ **Utilize Grants**

The Environmental Protection Agency and the Department of Energy periodically offer grants for the implementation of Energy Efficiency Programs.

Finding #9: GSD does not pursue other funding sources that may be available to supplement its loan program.

As previously stated, GSD's Program is entirely funded with loans obtained from DWP. The Department does not seek other funding sources for the implementation of energy conservation measures. The City's decision to fund energy efficiency projects through a low-interest loan from the DWP was reasonable and there is ample evidence from other municipalities where this practice has yielded positive results. However, it is important to research and explore other funding sources to supplement the City's limited resources for the Program.

Rebates, grants, zero-interest loans and other financial incentives for the installation of energy-efficient systems and equipment may be available from various sources. The Flex Your Power website (<http://www.fypower.com>) operated by a partnership of California utilities, businesses, institutions, government agencies and non-profit organizations, maintains a comprehensive database of utility, state, federal and private sector third-party programs offering educational, financial and technical assistance. There is also a service that allows organizations to register and be notified of relevant grant opportunities.

Other potential sources of funds include the Environmental Protection Agency and the Department of Energy. These agencies periodically offer grants for the implementation of energy efficiency programs. The nature of the programs and the availability vary over time. However, the programs may be found on their websites. Regular review of their sites may identify funding opportunities.

GSD indicated that it does not seek other loan and grant opportunities because its staff is not trained to research these other funding sources. The City's Department of Environmental Affairs has experience as the citywide coordinator of environmental grants and it should be able to assist GSD in researching grant opportunities.

Recommendation

- 16. GSD management should work with the Environmental Affairs Department to explore and research other grant opportunities to fund energy efficiency projects.**

Finding #10: GSD did not apply for all available rebates to reduce the loan repayment amount to DWP. The Department may have potentially lost approximately \$100,000 in rebates.

DWP offers cash rebates to business customers for qualifying energy-efficient lighting products that reduce peak load consumption. The MOU between the City and DWP also requires GSD to apply for rebates on their projects. Rebates can be applied to outstanding loans to reduce the balance owed. GSD stated that, generally, all lighting projects are eligible for a rebate.

To apply for rebates, GSD is required to submit an application to DWP. DWP then inspects the project to verify the cost of the project and items utilized for the project in order to determine rebate amounts.

GSD did not apply for available rebates that would have reduced the loan repayment amount to DWP. Specifically, the Department did not submit rebate applications for 48 (55%) out of 87 projects. Of the 40 applications submitted, DWP approved and paid a total of \$207,000 in rebates for 23 projects. DWP stated that 17 projects were denied due to the work not being completed at the time of its post-inspections.

We noted that GSD does not have any policies and procedures that would help maximize rebates. For example, there are no policies that identify personnel responsible for applying for rebates and the process for applying for and recording rebates. The Department may have potentially lost approximately \$100,000 in rebates that could have reduced the outstanding loan balance.

Recommendations

GSD management should:

- 17. Explore the feasibility of applying for rebates on the remaining completed projects.**
- 18. Establish procedures to ensure rebates are pursued for all eligible projects.**

**APPENDIX I
OFFICE OF THE CONTROLLER**

AUDIT OF ENERGY CONSERVATION MEASURES IN THE CITY

Ranking of Recommendations

| Finding Number | Description of Finding | Ranking Code | Recommendations |
|----------------|---|--------------|---|
| | Section I – Citywide Oversight and Program Planning | | |
| 1 | There is no one City department/agency with overall oversight and accountability for coordinating energy conservation measures installed by various city departments. | U | <p>The Mayor and Council should:</p> <ol style="list-style-type: none"> 1. Designate a central oversight department/agency that would be responsible for coordinating Citywide conservation measures. This department’s responsibilities should include: <ol style="list-style-type: none"> a) Setting goals and objectives for Energy Conservation Programs. b) Ensuring that adequate funding and resources exist. c) Issuing Citywide policies and procedures, and monitoring for compliance with procedures. d) Measuring actual performance, including energy savings and costs, against established goals. e) Identifying and implementing successful energy saving best practices, such as light-emitting diode (LED) Exit Sign Retrofits, LED Traffic Signals and street lighting technologies. f) Reporting outcome measures to the Mayor and Council on a periodic basis. |
| 2 | GSD does not have the staffing resources or | U | 2. The Mayor and Council should ensure that proper resources and |

| | | | |
|---|---|------------|--|
| | skills to effectively design and implement Energy Conservation Programs. | | expertise are available to effectively manage and implement the Energy Conservation Program, and ensure DWP's expertise is utilized. |
| 3 | GSD has not developed a comprehensive implementation plan or goals and objectives for the program. | U U | GSD management should: 3. Develop an implementation plan for the energy conservation program which includes goals and objectives for the program and how costs and energy savings should be measured. 4. Develop appropriate management reports to monitor the progress of the energy conservation program and periodically submit them to Council and the appropriate committees. |
| | Section II – Project Selection & Management | | |
| 4 | GSD could not demonstrate how it determines the priority of buildings to be retrofitted. In addition, two projects that were completed or proposed were non-lighting projects. The Department could not demonstrate why these projects were selected. | U | 5. GSD management should develop a formal risk assessment methodology to prioritize the order of buildings to be retrofitted for lighting replacements. |
| 5 | Inadequate oversight over the Energy Conservation Loan Program Fund has resulted in a large balance of \$980,000 accumulating in the Fund. Most of these monies should be transferred to the General Fund. | N N | GSD management should: 6. Identify labor costs incurred since the program's inception and transfer this amount from the Energy Conservation Loan Program Fund to the General Fund. 7. Develop a process to periodically transfer funds from the Energy Conservation Loan Program Fund to |

| | | | |
|---|---|---------------------------------|---|
| | | <p>N</p> <p>U</p> | <p>the General Fund to reimburse the General Fund for labor costs.</p> <p>8. Develop procedures to periodically compare estimated costs to actual costs to assess whether the methodology to estimate costs needs to be adjusted.</p> <p>9. Develop a spending plan for any monies remaining in the Energy Conservation Loan Program Fund after all transfers to the General Fund have been made.</p> |
| 6 | <p>GSD has only completed energy savings measures in 102 of its inventory of 958 buildings. The Department has made limited use of Energy Service Companies who could be utilized to maximize energy savings.</p> | <p>N</p> <p>D</p> | <p>GSD management should:</p> <p>10. Develop a plan to make more use of Energy Services Companies, hiring hall staff, and other resources, to increase the number of completed energy projects.</p> <p>11. Assess the cost effectiveness of utilizing Performance Guarantee contracts. If it is determined that they are not cost effective, GSD should request Council's approval to modify its agreement with DWP to exclude the performance guarantee provision from its agreement with DWP.</p> |
| 7 | <p>GSD does not have adequate documentation to support its \$1.5 million annual estimated savings.</p> | <p>N</p> <p>N</p> | <p>12. GSD management should maintain accurate records of project completion dates and documentation to show that it has used correct months from utility bills to calculate estimated actual energy savings.</p> <p>13. GSD management should periodically compare estimated savings per the technical proposals to actual estimated savings per utility bills and use the results to evaluate whether its assumptions for estimating costs need to be adjusted.</p> |

| | | | |
|----|--|--------------------------|--|
| | | N | 14. The Mayor and City Council should consider requiring an independent analysis of GSD's assumptions to estimate project savings. |
| 8 | GSD does not conduct post-inspections of completed projects to verify that savings are still being achieved. | N | 15. GSD management should develop procedures to perform post-inspections of completed projects, at least on a sample basis, to ensure the continued existence of installed equipment and its proper operation and maintenance. |
| | Section III – Project Funding | | |
| 9 | GSD does not pursue other funding sources that may be available to supplement its loan program. | N | 16. GSD management should work with the Environmental Affairs Department to explore and research other grant opportunities to fund energy efficiency projects. |
| 10 | GSD did not apply for all available rebates to reduce the loan repayment amount to DWP. The Department may have potentially lost approximately \$100,000 in rebates. | U U | GSD management should: 17. Explore the feasibility of applying for rebates on the remaining completed projects. 18. Establish procedures to ensure rebates are pursued for all eligible projects. |

Description of Recommendation Ranking Codes

U- Urgent-The recommendation pertains to a serious or materially significant audit finding or control weakness. Due to the seriousness or significance of the matter, immediate management attention and appropriate corrective action is warranted.

N- Necessary- The recommendation pertains to a moderately significant or potentially serious audit finding or control weakness. Reasonably prompt corrective action should be taken by management to address the matter. The recommendation should be implemented within six months.

D- Desirable- The recommendation pertains to an audit finding or control weakness of relatively minor significance or concern. The timing of any corrective action is left to management's discretion.

N/A- Not Applicable