

OFFICE OF THE CITY AUDITOR

City and County of Honolulu
State of Hawai'i



Audit of the City's Electricity Costs, Consumption, and Management

A Report to the
Mayor
and the
City Council of
Honolulu

Report No. 08-02
July 2008

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Submitted by

THE CITY AUDITOR
CITY AND COUNTY
OF HONOLULU
STATE OF HAWAII

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Foreword

This audit was conducted pursuant to the authority of the Office of the City Auditor, as provided in the Revised Charter of Honolulu. This audit topic was selected, in part, by concerns raised in Resolution 06-144, which noted the instability and uncertainty of crude oil supply and price, and its impact on city government operations. The resolution requested our office to conduct a comprehensive energy audit of city-owned buildings and an assessment of present and potential energy-saving programs and initiatives. Although the Honolulu City Council did not adopt Resolution 06-144, our office deemed that an audit focused on select management issues related to electricity cost and consumption would be beneficial to the council and Honolulu's taxpayers.

We wish to express our appreciation for the cooperation and assistance provided to us by the staff of the Departments of Budget and Fiscal Services, Design and Construction, Facility Maintenance, and others who we contacted during this audit.

Leslie I. Tanaka, CPA
City Auditor

EXECUTIVE SUMMARY

Audit of the City's Electricity Costs, Consumption, and Management

Report No. 08-02, July 2008

This audit was conducted pursuant to the authority of the Office of the City Auditor, as provided in the Revised Charter of Honolulu. This audit topic was selected, in part, by concerns raised in Resolution 06-144, which noted the instability and uncertainty of crude oil supply and price, and its impact on city government operations. The resolution requested our office to conduct a comprehensive energy audit of city-owned buildings and an assessment of present and potential energy-saving programs and initiatives. We advised the council, however, that an outside consultant would be needed to address the full scope of the audit proposed by the resolution. Although the Honolulu City Council did not adopt Resolution 06-144, our office deemed that an audit focused on select management issues related to electricity cost and consumption would be beneficial to the council and Honolulu's taxpayers.

Background

In FY2006-07, the City and County of Honolulu consumed over 169 million kilowatt hours of electricity at a cost of \$28.5 million. These figures cover electricity usage for city buildings, street lighting and signals, parks, and other municipal facilities. In addition to electricity, the city also manages the use of other energy and related resources such as fuel, water, recyclables, and waste.

The city's energy management functions are disbursed among three primary departments. The Department of Budget and Fiscal Services monitors energy consumption and reduces costs. Department staff reviews electricity bills, makes payments on behalf of city agencies, and provides electricity budgeting guidelines to city departments. Budget and fiscal services personnel are also responsible for managing the purchase of energy-efficient office products identified in the federal government's *Energy Star* program. The Department of Design and Construction's Mechanical/Electrical Division is responsible for the administration, coordination, management, and monitoring of electrical and mechanical upgrades to existing city facilities. The division is also tasked with

planning, designing, and managing energy conservation programs. The Department of Facility Maintenance's energy management goals include increasing efficiency through work tracking systems for road maintenance, property management, and electrical maintenance. The department also supports the use of hybrid vehicles, bio-diesel fuels, and energy-efficient lighting in an effort to reduce the city's reliance on fossil fuels.

In addition to the departments' jurisdiction over electricity management in city operations, the administration has also taken steps to establish energy-related initiatives aimed at managing the city's energy future. The current administration established a formal energy team in September 2005 with the formation of the Energy Issues Committee comprised of agency administrators from throughout the executive branch. This committee evolved into the Mayor's Energy and Sustainability Task Force, which in September 2007 issued the *21st Century Ahupua'a* sustainability plan for FY2006-07 to FY2016-17. The plan establishes a goal to reduce electricity consumption in existing city public buildings by 10 percent from FY2006-07 to FY2016-17 as compared to FY2004-05 baseline data.

Summary of Findings

1. The city's electricity expenditures rose significantly despite ongoing conservation efforts. Before FY2002-03 and FY2006-07, the city implemented eight formal electricity conservation programs and other informal initiatives aimed at reducing electricity cost and consumption. Although the city's electricity consumption increased 5.7 percent over our five-year review period, expenditures soared by 44 percent.
2. The city's management of electricity costs and consumption lacks full accountability. City agencies are generally unable to verify whether electricity consumption or cost goals and objectives were achieved. Because responsibility for electricity costs, consumption, and conservation are dispersed among several city agencies, the city lacks a comprehensive framework to effectively manage electricity cost and consumption. The budget and fiscal services department does not fully enforce procurement guidelines related to the purchase of *Energy Star*-rated equipment. Also, the city does not consistently follow best practices in electricity management.

Finding 1: The City's Electricity Expenditures Rose Significantly Despite Ongoing Conservation Efforts

- We found that citywide electricity expenditures increased 44 percent between FY2002-03 and FY2006-07. According to data provided by Hawaiian Electric Company, in FY2002-03, the city was billed \$19.8 million for electricity; in FY2006-07, billing grew to just over \$28.5 million. According to data provided by the Department of Budget and Fiscal Services, the city paid \$18.5 million in FY2002-03, and \$27.1 million in FY2006-07. The three city agencies with the largest percentage increase between FY2002-03 and FY2006-07 are the Department of Community Services (290 percent); HPD (153 percent), and Emergency Services Department (73 percent).
- We found that citywide electricity consumption increased by 5.7 percent between FY2002-03 and FY2006-07. In FY2002-03, the city consumed 160.2 million kilowatt hours; in FY2006-07, consumption increased to 169.3 million kilowatt hours. Year-over-year increases were fairly flat, increasing or decreasing less than 1 percent annually, except in FY2005-06 when electricity consumption increased 4.6 percent from the previous fiscal year.
- Our survey of city agencies reveals cost and consumption trends during FY2002-03 to FY2006-07. We sent surveys to 21 city agencies and received 13 responses from agencies that incurred electricity expenses:
 - 10 of 13 respondents reported a general increase in electricity costs; only 1 respondent indicated a decrease.
 - 7 of 13 respondents reported an increase in electricity consumption; only 2 respondents indicated a decrease in consumption.

Through the survey responses, we found that city government grew over the period of FY2002-03 to FY2006-07 in facilities, equipment, and personnel. Electricity conservation efforts either increased or stayed the same during the same time period. However, the conservation efforts did not appear to offset rising electricity costs.

- We reviewed a judgmental sample of 100 electricity accounts and found variations in cost and consumption trends. Our review showed that electricity consumption increased 5.2 percent from

FY2002-03 to FY2006-07, but fluctuated year-over-year during the five-year period. We also found that electricity expenditures increased 9.9 percent from FY2002-03 to FY2006-07, but FY2006-07 showed a downward trend. Additionally, we found that only 19 percent of account codes showed decreases in both cost and consumption; and that 34 percent showed an increase in both.

- Our review notes that between FY2002-03 and FY2006-07, the city implemented eight formal electricity conservation projects and other smaller projects.

Finding 2: The city's management of electricity cost and consumption lacks full accountability

- We found that city agencies are generally unable to verify whether electricity consumption or cost goals and objectives were achieved. The Department of Design and Construction did not have annual verification reports on file for the Honolulu Hale electrical upgrade and retrofit performance contract with Johnson Controls, Inc., nor was there any city-maintained data for us to review that would ensure that performance goals were met. Additionally, the Department of Enterprise Services was unable to verify that the 2003 Ewa Villages golfcart re-charging project goals and objectives were achieved. We also found that electricity monitoring and tracking alternatives are limited and in some instances may undermine cost savings benefits. One option is to hire a third party consultant to perform monitoring activities. However, this can be costly and may also offset any cost savings. Also, the Department of Budget and Fiscal Services does not follow procurement guidelines for *Energy Star* equipment purchases.
- We found that the city lacks a comprehensive framework to effectively manage electricity costs and consumption. Some government jurisdictions established centralized leadership in electricity management. In 1990, the city of Portland, Oregon was the first to establish a local energy policy in the United States. It created an Energy Office and a citizen's Energy Commission and established a goal to increase energy efficiency by 10 percent in all sectors of the city and reduce city government energy bills by \$1 million in ten years. The cities of Philadelphia, Pennsylvania, Berkeley, California and Evanston, Illinois, as well as the State of Michigan, all have dedicated energy offices with jurisdiction over all government operations. In contrast, we found that for Honolulu, no

one city agency is responsible for managing electricity costs and consumption. As a result, citywide data for effective analysis of electricity management is lacking.

- We found that the *21st Century Ahupua‘a* electricity consumption goal lacks a plan for achievement. Although the plan to reduce electricity consumption by 10 percent in city public buildings in ten years became effective in FY2006-07, we found no clear definition as to what city facilities were subject to the 10 percent reduction and no guideline as to what affected agencies must do to meet this goal. Furthermore, there is no evidence that the task force is currently measuring the progress of city agencies in meeting this mandate.
- Despite some shortcomings, we also found that the Department of Budget and Fiscal Services took a positive step and began issuing electricity budgeting guidelines to all city agencies in 2007. These guidelines presented budget formulas that are designed to help city departments establish more accurate electricity budgets. Prior to FY2006-07, the budget and fiscal services department did not issue any guidance to other city departments.
- We also found that city agencies do not consistently follow best practices in electricity management. We identified eight select best practices identified by the federal government’s *Energy Star* program and found that city agencies’ adherence varied. We found the three best practices that city agencies identified as most commonly performed are purchasing *Energy Star*-rated equipment, assigning an individual or team dedicated to manage departmental electricity cost and consumption, and gathering, tracking, and analyzing electricity data. The best practices least commonly performed by city agencies are providing incentives or recognition for meeting electricity cost and consumption goals, providing staff with specialized training in electricity management, communicating electricity performance goals and reporting outcomes to staff, and adhering to a formal energy policy with set performance goals. Additionally, the city has no plans for future energy or billing audits, nor does it effectively communicate electricity management results to stakeholders.

Recommendations and Response

We made several recommendations to improve the city's management of electricity cost and consumption. We recommend that the mayor continue efforts to contain electricity costs and consumption and consider consolidating energy management duties under a single entity. We also suggested that the Mayor's Energy and Sustainability Task Force develop an action plan for meeting the 10 percent reduction in electricity consumption for the city's existing public buildings between FY2006-07 and FY2016-17.

We also recommend that the managing director develop a monitoring strategy to ensure that all city agencies' cost and consumption savings goals are met if using general funds to support the program and consider implementing electricity management best practices such as reporting electricity management results to employees, provide training, and funding periodic electricity or billing audits. We further recommend compiling data and producing a comprehensive annual report on the city's overall electricity cost and consumption. Additionally, we recommend that the managing director examine design and construction department's oversight of its performance contract with Johnson Controls, Inc. to determine whether contract goals and objectives were met and if any penalties have accrued.

We recommend that the budget and fiscal services department enforce provisions of its policies and procedures manual related to the purchase of *Energy Star*-rated products by amending its vendor agreements and ensuring that agencies provide evidence of purchases' *Energy Star* rating where applicable. We also suggest that the department continue to provide city agencies guidance in formulating electricity budgets.

We also recommend that the design and construction department enforce all performance contract requirements, including monitoring and verification reports, and ensuring that the city collects funds from contractors that do not meet electricity cost and consumption guarantees.

In response to our draft report, the Department of Budget and Fiscal Services director, on behalf of the affected city agencies, expressed appreciation for the audit's recognition of the many accomplishments the city has made to reduce electricity consumption. The director also expressed concerns over the audit's narrow scope and provided clarifying information regarding billing data provided by Hawaiian Electric Company and the design and construction department's use of web-

based electricity monitoring technology. We amended the draft report to address those concerns.

In addition, the responding agencies took exception to our finding related to the purchase of *Energy Star*-rated equipment, the department of design and construction's monitoring of the Honolulu Hale performance contract, and the apparent lack of an implementation plan for the *21st Century Ahupua'a* section related to energy conservation. Although the responding agencies provided clarifying information on these issues, they did not have a substantive effect on the audit findings. Thus, for these issues and other concerns raised in the departments' response, we stand by our audit findings.

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Chapter 1

Introduction

This audit was conducted pursuant to the authority of the Office of the City Auditor, as provided in the Revised Charter of Honolulu. The audit was included in the office's Annual Workplan for FY2007-08, which was sent to the mayor and the Honolulu City Council in June 2007.

Although not adopted by the city council, Resolution 06-144 requested the city auditor to conduct a comprehensive energy audit of city-owned buildings and facilities. The resolution noted that the instability and uncertainty regarding the supply and price of crude oil, a commodity on which the state is almost entirely dependent in meeting its energy needs, calls for rigorous energy management practices by the city to control costs and maximize energy efficiencies. In an effort to take the city's energy conservation, management, and cost-control efforts to a higher level, the city council sought to have the city auditor complete a comprehensive energy audit of city-owned buildings, including an assessment of present and potential energy-saving programs and initiatives. The city auditor testified that outside resources would be needed to address the full scope of the proposed audit under Resolution 06-144.

While the council decided to forgo a formal energy audit, the Office of the City Auditor acknowledges the issues raised by the resolution and recognizes the continued concerns regarding the city's management of energy costs and consumption. Thus, our office deemed that an audit focused on select management issues related to electricity costs and consumption would be beneficial to the council and Honolulu's taxpayers.

Background

In FY2006-07, the City and County of Honolulu consumed over 169 million kilowatt hours of electricity at a cost of \$28.5 million. These figures cover electricity usage for city buildings, street lighting and signals, parks, and other municipal facilities. In addition to electricity, the city also manages the use of other energy and related resources such as fuel, water, recyclables, and waste.

The city's energy management functions are disbursed among three primary departments. The Department of Budget and Fiscal Services is

responsible for monitoring energy consumption and reducing costs, the Department of Design and Construction designs, plans, and manages energy conservation programs, and the Department of Facility Maintenance promotes energy alternatives to reduce the city's reliance on fossil fuels.

Department of Budget and Fiscal Services is responsible for monitoring energy consumption and reducing costs

The budget and fiscal services department's goals and objectives are to 1) assess and improve the productivity and cost effectiveness of city operations; 2) assess and improve the departments' operations to optimize resource allocations; and 3) increase departmental efficiency by using compatible technology and revising current policies and procedures.

Specifically related to electricity management, the department's fiscal sustainability objective in FY2005-06 and FY2006-07 included a provision to monitor energy consumption and reduce costs. The department monitors electricity costs using budgets as the guideline. Ten fiscal officers are responsible for a quarterly review of all city agencies' electricity costs and will follow up with agencies that have excessively high electricity bills. In addition, beginning in FY2006-07, the department began issuing budgeting guidelines to assist city agencies in developing electricity budgets. The department also manages the procurement of energy-efficient office products which are identified by the federal government's *Energy Star* program. In 2005, the department convened the administration's *Energy & Sustainability Task Force* to address the rising fuel oil prices and its impact to the city's operating budget. The task force's objective is to brainstorm energy reducing initiatives to offset the city's increasing energy costs.

Department of Design and Construction plans, designs, and manages energy conservation programs

The design and construction department is the central agency responsible for the planning, design, and construction management of the city's Capital Improvement Program (CIP). The department's *Mechanical/Electrical Division* is responsible for the administration, coordination, management, and monitoring of electrical and mechanical upgrades to existing facilities including lighting retrofits and air-conditioning upgrades. The division is specifically tasked with planning, design, and management of energy conservation programs.

In FY2005-06, the department noted the following energy-related accomplishments:

- Participated in energy conservation programs sponsored by utility companies and state agencies.
- Developed long-range planning of energy conservation projects for government office buildings.
- Participated in the Hawaiian Electric Company (HECO) Energy Efficiency Program and Rebuild Hawai‘i program.
- Analyzed electricity bills for the Department of Enterprise Services for the past two fiscal years.
- Participated in the city’s Energy Issues Committee to help reduce electricity consumption.
- Installed a new energy management system to control air conditioning for energy savings at Kapolei Hale.
- Replaced obsolete fluorescent light fixtures with energy efficient fixtures at the Hale Pauahi Municipal parking structure.
- Managed on-going energy services performance contract for Fasi Municipal Building and police department headquarters (annual cost savings of \$500,000).
- Established a baseline energy usage and recommended energy conservation improvements for Neal Blaisdell Center arena.

Exhibit 1.1
Centrifugal Chiller, Fasi Municipal Building



This 400-ton centrifugal chiller for the Fasi Municipal Building, which replaced an older, 325-ton model, provides greater efficiency.

Source: Office of the City Auditor

In addition, the *Street Lighting and Facilities Electrical Branch* provides for planning and designing roadway and public facilities lighting and for the design and review of parks' electrical facilities. FY2005-06 accomplishments include:

- Established roadway standards for lighting on city streets.
- Managed joint coordination with Hawaiian Electric Company for the city's 874 electrical poles.

The design and construction department oversaw the installation of energy efficient air conditioning, lighting, and energy management systems at Honolulu Hale. The Honolulu Hale project contributed toward the city's receipt of the 2004 Energy Efficiency Awards, Project of the Year, sponsored by Hawaiian Electric Company.

The department does not have jurisdiction over all city buildings

In FY2003-04 the design and construction department reported that it coordinated, planned, designed, or implemented programs related to the *city-wide energy conservation program*. However, the department does not have jurisdiction over all city-owned buildings. Some of the facilities under design and construction's jurisdiction include:

- Police stations
- Waikiki Natatorium
- Kapolei Civic Center
- Honolulu Hale
- Fasi Municipal Building
- Medical Examiner's Office
- Honolulu Police Department Headquarters
- City Square at Dillingham Blvd.

Some of the facilities not under the department's jurisdiction include Neal Blaisdell Center, Waikiki Shell, municipal golf courses, Honolulu Zoo, fire stations, and refuse and wastewater treatment facilities.

Additionally, not all city departments pay electricity costs. In some instances, departments are contained in a city-owned building that is managed by another department (e.g. the design and construction department pays electricity for Honolulu Hale and Fasi Municipal Building). The Honolulu Police Department currently pays electricity for only four of its facilities. Other departments and agencies lease commercial space where electricity costs are not paid separately by the city. City departments and agencies that do not directly pay for electricity include: the prosecuting attorney, planning and permitting, human resources, budget and fiscal services, information technology, corporation counsel, medical examiner, and the mayor.

The department serves as a consultant to city agencies

For agencies and facilities that are not under design and construction's jurisdiction, the department serves as a consultant. The department responds to requests to plan energy projects for these agencies. For example, at the Department of Enterprise Services' request, design and construction assisted with a lighting retrofit project. Design and construction administrators note that although the department does not have jurisdiction over all city facilities, it is responsible for reviewing all proposed capital improvement projects, which offers the department an opportunity to review agencies' proposals and provide input.

Department of Facility Maintenance promotes energy alternatives to reduce the city's reliance on fossil fuels

The facility maintenance department's mission is to provide efficient, effective, and progressive maintenance of assigned city facilities for the well-being of O'ahu's communities and to attain city goals. One of the department's goals is to increase efficiency through work tracking systems for road maintenance, property management, and electrical maintenance. The department also supports using environmentally-friendly vehicles such as hybrid vehicles, fuels such as bio-diesel, and energy-efficient lighting to reduce harmful emissions to the environment, and to reduce reliance on fossil fuels.

Mayor's Energy and Sustainability Task Force is the Current Administration's Energy Initiative

The current administration began establishing a formal energy management team in 2005 with the formation of the Energy Issues Committee, which included agency representatives from throughout the executive branch. This committee evolved into a broader task force that formulated specific goals and objectives for the city's energy future.

Task force developed energy conservation and sustainability goals and objectives

In September 2005, the Department of Budget and Fiscal Services convened staff from various city departments and formed the Energy Issues Committee, which was tasked to address rising fuel oil prices and its impact to the city's operating budget. The committee's objective was to brainstorm energy reducing initiatives to offset the city's increased energy costs. The committee established three subcommittees:

- Electricity
- Fuel Usage
- Innovative Ideas or *Out-of-the-Box*

An employee awareness subcommittee was later added to help foster energy conservation at the individual employee level. In early 2007, the Energy Issues Committee evolved into the Mayor's Energy and Sustainability Task Force to develop a 10-year plan to make the city even more energy efficient and sustainable. The task force's objectives are to:

- Examine current technology and improve upon existing practices to make the city more energy efficient and sustainable;
- Identify new technologies and practices that can be used to improve city operations by maximizing energy efficiency, reducing waste, and protecting the environment;
- Adhere to the Mayor's vision of the *21st Century Ahupua'a* and its driving principles;
- Align with the U.S. Conference of Mayor's Climate Control Agreement of 2004 advocating the reduction of green house gas emissions; and
- Develop a 10-year plan with goals and benchmarks in the areas of energy conservation, fuel and transportation, material recovery and recycling, water conservation, watershed protection and management, sustainable agriculture, innovative urban forestry, and education and outreach.

Task force members include representatives from the following city agencies:

- Mayor's Office of Culture and the Arts and Office of Economic Development
- Budget and Fiscal Services
- Customer Services
- Design and Construction
- Enterprise Services

- Facility Maintenance
- Information Technology
- Parks and Recreation
- Environmental Services
- Transportation Services
- Board of Water Supply

The task force meets quarterly, or as-needed, to perform duties which include assessing the current status of energy conservation and sustainability efforts throughout the city by reviewing reports from the working groups, preparing and submitting quarterly status reports to the mayor, and reviewing and adjusting benchmarks for major changes with city functions and facilities.

The task force's efforts contrast to the prior administration's approach to energy management. In January 2003, the prior city administration appointed a former city councilmember to fill an executive assistant position, City Energy Coordinator, for the purpose of coordinating the city's energy conservation program and the development of the city's Sustainability Master Plan. Specifically, the position was responsible for identifying and pushing implementation of internal city projects to make the city more self-sustaining in regard to energy. They included specific initiatives such as the air conditioning retrofit for the Fasi Municipal Building, development of a city-wide energy performance contract, and identifying projects to enhance city self-sustainability in regard to energy. The coordinator was also tasked to monitor, participate, and coordinate programs and projects that promote energy and resource efficiency, as well as assist in organizing workshops. The coordinator position was terminated in December 2004.

Sustainability plan establishes a goal to reduce electricity consumption by 10 percent over 10 years

In September 2007, the Energy and Sustainability Task Force, in concert with the mayor, issued the *21st Century Ahupua'a*, which establishes the city's sustainability plan for the period of 2007–2017. The *21st Century Ahupua'a*'s sustainability plan seeks, as part of its goals, to:

1. Reduce electricity consumption in existing city public buildings by 10 percent from FY2006-07 to FY2016-17 as compared to FY2004-05 baseline data.
2. Construct new city buildings using *Green Building* practices.
3. Retrofit city affordable housing projects with energy efficient light fixtures during routine maintenance.

To achieve these goals, the plan calls for city agencies to schedule and implement energy conservation retrofit projects with a simple payback of 20 years or less. Agencies are tasked to rank city buildings by energy usage to identify baseline and initial energy savings potential, conduct energy assessments (audits) of high electricity consumption facilities, evaluate cost effectiveness, and implement cost effective projects with capital improvement program funds or other financing. In addition, property managers at various city affordable housing projects will replace burnt out incandescent and obsolete fluorescent lights with energy efficient lights during routine maintenance.

Audit Objectives

1. Review and assess citywide expenditures for electricity from FY2002-03 to FY2006-07
2. Review and assess the city's management of electricity consumption from FY2002-03 to FY2006-07.
3. Make recommendations as appropriate.

Scope and Methodology

We focused our review on electricity expenditure data maintained by the Department of Budget and Fiscal Services and Hawaiian Electric Company from FY2002-03 to FY2006-07, and individual departments and agencies as appropriate. We reviewed and analyzed electricity consumption data from a sample of select city departments and agencies. We also reviewed and assessed a sample of energy-efficiency projects implemented between FY2002-03 and FY2006-07 to determine if efficiency targets were achieved and maintained. We tested electricity-related operations for compliance with applicable city charter, ordinance, policies, and procedures related to electricity consumption. Finally, we interviewed administrators and staff from the Departments of Budget

and Fiscal Services, Design and Construction, Facility Maintenance, and HECO. For purposes of this audit, we excluded the Board of Water Supply due to its quasi-government status. Any *citywide* references contained in this report excludes the board.

In conducting this audit, we sought to examine the city's *overall* approach to managing electricity costs, consumption and management, rather than evaluating those variables for individual city agencies. Also, during our audit planning phase we found that not all city agencies maintain consistent electricity consumption data for our five-year review period, which limited our analyses. Furthermore, due to the audit's focus on electricity cost and consumption, we did not examine the city's use or conservation of other related energy resources such as fuel, water, recyclables, alternative energy, and solid waste management. While we acknowledge some inter-relatedness between energy sources in managing electricity cost and consumption, this audit focused strictly on electricity provided by Hawaiian Electric Company.

This audit was conducted in accordance with Generally Accepted Government Auditing Standards.

Chapter 2

The City's Electricity Conservation and Cost Containment Initiatives are Hampered By a Fragmented Management Structure that Lacks Accountability and Fails to Effectively Implement Best Practices

Over the five-year period spanning FY2002-03 through FY2006-07, Honolulu city government consumed over 821 million kilowatt hours of electricity at a cost of nearly \$120 million. When comparing the beginning of this time period with the end, we found that electricity consumption increased by 5.7 percent, but electricity cost increased by a disproportionate rate of 44 percent. The city administration, in coordination with its lead electricity management agencies of budget and fiscal services, and design and construction, implemented several energy conservation projects during this time period. While these efforts are commendable, we found that in some cases the energy cost and consumption savings cannot be, or were not, evaluated. Also, the city's current organizational structure does not support a citywide strategy for energy management. City government could further improve efficiencies by enforcing existing energy conservation protocols and implementing various management best practices suggested by the federal government's *Energy Star* program.

Summary of Findings

1. The city's electricity expenditures rose significantly despite ongoing conservation efforts. Between FY2002-03 and FY2006-07, the city implemented eight formal electricity conservation programs and other informal initiatives aimed at reducing cost and consumption. Although the city's electricity consumption increased 5.7 percent over our five-year review period, expenditures soared by 44 percent.
2. The city's management of electricity costs and consumption lacks full accountability. City agencies are generally unable to verify whether electricity consumption or cost goals and objectives were achieved. Because responsibility for electricity costs, consumption, and conservation are dispersed among several city agencies, the city

lacks a comprehensive framework to effectively manage electricity cost and consumption. The budget and fiscal services department does not fully enforce procurement guidelines related to the purchase of *Energy Star*-rated equipment. Also, the city does not consistently follow best practices in electricity management.

The City's Electricity Expenditures Rose Significantly Despite Ongoing Conservation Efforts

Citywide electricity expenditures increased 44 percent between FY2002-03 and FY2006-07

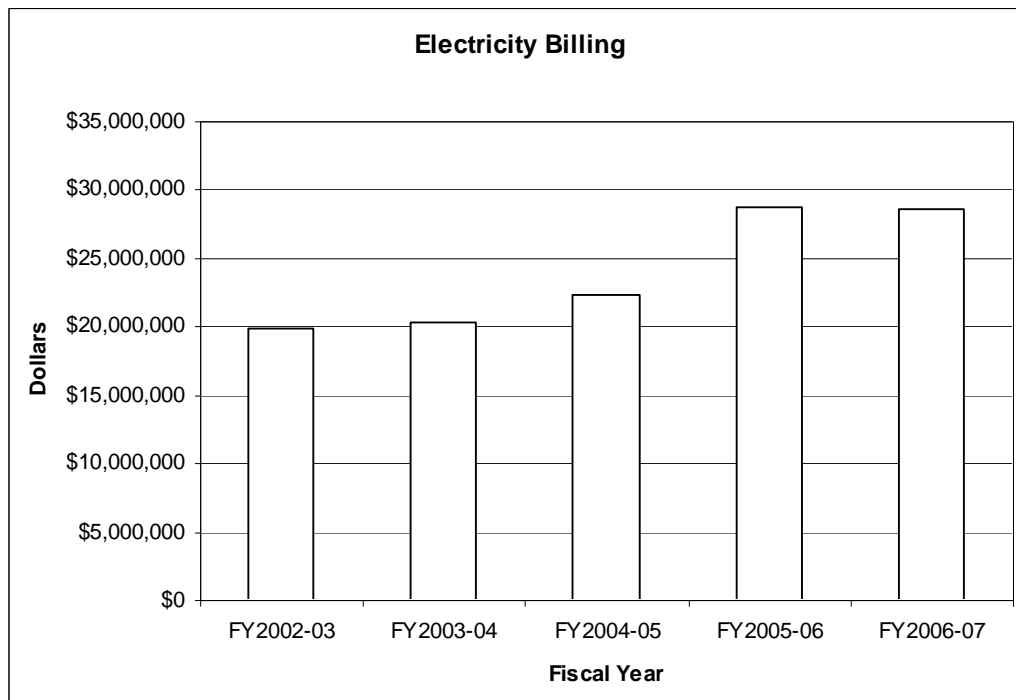
The city's electricity expenditures rose significantly despite ongoing conservation efforts. Between FY2002-03 and FY2006-07, the city implemented eight formal electricity conservation programs and other informal initiatives aimed at reducing costs and consumption. Although the city's electricity consumption increased 5.7 percent over our five-year review period, expenditures soared by 44 percent.

In order to evaluate the city's electricity expenditures we reviewed billing information provided by Hawaiian Electric Company (HECO) and expenditure data provided by the Department of Budget and Fiscal Services. We found that there are a variety of cost centers within the city's current structure and that different departments have varying electricity usage. We also found differences in the expenditure figures provided by HECO and the budget and fiscal services department.

According to billing data in FY2002-03, HECO billed the city \$19,829,609 for electricity. In FY2006-07, the amount billed for electricity increased 44 percent, to \$28,554,474. During the period of FY2002-03 to FY2006-07, year-over-year figures show a general increase in electricity cost, with a significant spike between FY2004-05 and FY2005-06. In that fiscal year, the city's electricity billing spiked by nearly 29 percent. Conversely, between FY2005-06 and FY2006-07, electricity billing actually decreased by just over three-quarters of one percent. Exhibit 2.1 reveals the city's electricity costs for FY2002-03 to FY2006-07.

Exhibit 2.1
City's Electricity Billing
Hawaiian Electric Company Data
FY2002-03 to FY2006-07

<i>Fiscal Year</i>	<i>Billing Amount</i>	<i>% Change from Prior Year</i>
FY2002-03	\$19,829,609	-----
FY2003-04	\$20,360,017	2.67%
FY2004-05	\$22,386,594	9.95%
FY2005-06	\$28,778,974	28.55%
FY2006-07	\$28,554,474	-0.78%



Source: Hawaiian Electric Company

The Department of Budget and Fiscal Services also provided electricity expenditure data. According to departmental figures, the city paid \$18,535,138 for electricity expenses in FY2002-03, and \$27,140,931 in FY2006-07, which represents an increase of 46 percent. The three agencies with the largest percentage increase in electricity expenditures between FY2002-03 and FY2006-07 are the Department of

Community Services (290 percent), Honolulu Police Department (153 percent), and Emergency Services Department (73 percent). Exhibit 2.2 shows the city's electricity costs, by city agency, as reported by budget and fiscal services, for FY2002-03 to FY2006-07.

Exhibit 2.2
City's Electricity Expenditures
Budget and Fiscal Services Data
FY2002-03 to FY2006-07

Agency	Fiscal Year					% Change FY2002-03 to FY2006-07
	2002-03	2003-04	2004-05	2005-06	2006-07	
DES	\$1,177,204	\$1,178,465	\$1,272,085	\$1,384,895	\$1,383,410	17.5%
DDC	\$3,479,410	\$3,554,781	\$3,940,956	\$4,925,416	\$4,394,981	26.3%
CSD	\$40,594	\$38,146	\$45,202	\$52,735	\$55,073	35.7%
HFD	\$525,873	\$546,010	\$589,655	\$764,715	\$860,640	63.7%
ESD	\$27,563	\$28,700	\$33,315	\$39,981	\$47,681	73.0%
DCS	\$48	\$1,954	\$2,157	\$607	\$187	289.6%
MAY	\$39,608	\$44,189	\$39,726	\$41,910	\$41,689	5.3%
DPR	\$2,385,583	\$2,548,763	\$2,729,764	\$3,395,411	\$3,336,403	39.9%
HPD	\$6,354	\$6,403	\$8,035	\$14,735	\$16,053	152.6%
DFM	\$3,433,906	\$3,580,231	\$3,835,491	\$4,758,535	\$4,804,898	39.9%
DTS	\$445,947	\$513,202	\$536,307	\$585,417	\$579,755	30.0%
ENV	\$6,973,048	\$7,628,952	\$8,118,461	\$11,006,243	\$11,620,161	66.6%
TOTAL	\$18,535,138	\$19,669,796	\$21,151,154	\$26,970,600	\$27,140,931	46.4%

LEGEND

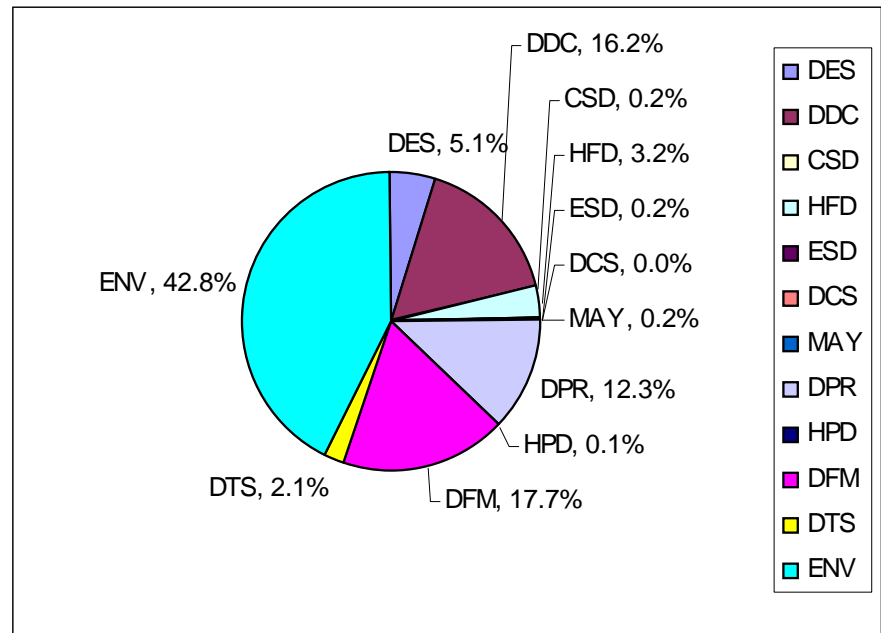
DES – Department of Enterprise Services
 DDC – Department of Design and Construction
 CSD – Customer Services Department
 HFD – Honolulu Fire Department
 ESD – Emergency Services Department
 DCS – Department of Community Services

MAY – Mayor
 DPR – Department of Parks and Recreation
 HPD – Honolulu Police Department
 DFM – Department of Facility Maintenance
 DTS – Department of Transportation Services
 ENV – Department of Environmental Services

Source: Department of Budget and Fiscal Services

In FY2006-07, the Department of Environmental Services spent \$11.6 million for electricity, which represents 43 percent of the city's total electricity expenditures. The Department of Facility Maintenance had the second highest expenditures of \$4.8 million, which represents 18 percent of citywide expenditures. The Department of Design and Construction followed with \$4.4 million, or 16 percent of citywide expenditures. Exhibit 2.3 depicts the distribution of electricity expenditures, by agency, for FY2006-07.

Exhibit 2.3
City's Electricity Expenditures by Agency Distribution
FY2006-07



LEGEND

- DES– Department of Enterprise Services
- DDC– Department of Design and Construction
- CSD– Customer Services Department
- HFD– Honolulu Fire Department
- ESD– Emergency Services Department
- DCS– Department of Community Services
- MAY– Mayor
- DPR– Department of Parks and Recreation
- HPD– Honolulu Police Department
- DFM– Department of Facility Maintenance
- DTS– Department of Transportation Services
- ENV– Department of Environmental Services

Source: Department of Budget and Fiscal Services

We note that billing figures reported by HECO for FY2006-07 are about \$1.4 million higher, or five percent, than expenditure figures provided by the budget and fiscal services department. The HECO account manager explained that city accounts open, close, and transfer on an ongoing basis and that their records are the result of their best efforts to accurately capture expenditure data. HECO expressed a willingness to work with the city to reconcile and appropriately identify any discrepancies.

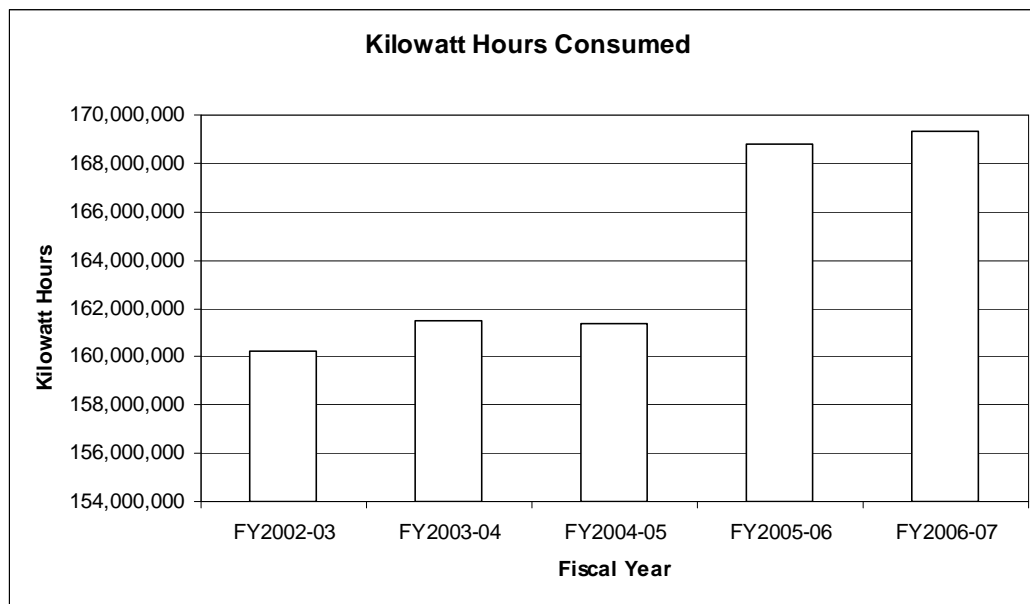
Citywide electricity consumption increased 5.7 percent between FY2002-03 and FY2006-07

In seeking to identify the city's electricity consumption between FY2002-03 and FY2006-07, we found that no city agency maintained comprehensive usage data. The budget and fiscal services department only maintains expenditure data. Thus, for this evaluation, we relied on data provided by HECO.

In FY2002-03, HECO reported that the city used 160,201,574 kilowatt hours of electricity. In FY2006-07, the city used 169,311,476 kilowatt hours—an increase of 5.7 percent from FY2002-03. During the five-year period covering FY2002-03 to FY2006-07, consumption was fairly flat, with annual increases or decreases of less than one percent year-over-year. The only exception was a 4.6 percent increase in electricity consumption in FY2005-06, from the previous fiscal year. Exhibit 2.4 illustrates the city's electricity use from FY2002-03 and FY2006-07.

Exhibit 2.4
City's Electricity Consumption
Hawaiian Electric Company Data
FY2002-03 to FY2006-07

<i>Fiscal Year</i>	<i>Kilowatt Hours</i>	<i>% Change from Prior Year</i>
FY2002-03	160,201,574	-----
FY2003-04	161,509,396	0.82%
FY2004-05	161,377,514	-0.08%
FY2005-06	168,807,182	4.60%
FY2006-07	169,311,476	0.30%



Source: Hawaiian Electric Company

Survey of city agencies reveals cost and consumption trends

In order to obtain additional information about electricity cost and consumption trends within city government, we distributed a questionnaire to 21 city departments and agencies requesting electricity-related information under their respective jurisdiction. We received 13 responses that reported data for the period FY2002-03 to FY2006-07:

- 10 of 13 respondents reported a general increase in electricity costs; only 1 respondent indicated a decrease in electricity costs.

- 7 of 13 respondents reported an increase in electricity consumption; only 2 respondents indicated a decrease in electricity consumption.
- 7 of 13 respondents reported an increase in electricity conservation efforts; 6 respondents indicated that conservation efforts remained the same.
- 9 of 13 respondents reported an increase in facilities such as office space; no respondent reported a decline in facilities.
- 9 of 13 respondents reported an increase in equipment usage; no respondent reported a decrease in equipment usage.
- 8 of 13 respondents reported an increase in personnel; no respondent reported a decrease in personnel.

Through these responses we found that, generally, city government has grown over the period of FY2002-03 to FY2006-07 in facilities, equipment, and personnel. City conservation efforts either increased or stayed the same during the same time period. However, these conservation efforts did not appear to completely offset the effects of city growth and increased electricity cost. Four of seven agencies that indicated an increase in conservation efforts over the last five fiscal years also noted an increase in electricity consumption. Six of the seven agencies also noted an increase in electricity costs. Based on this agency feedback, we found that even though conservation efforts are in place, electricity cost and consumption continue to rise.

Sample review of 100 electricity accounts show variations in cost and consumption trends

The data set provided by HECO listed monthly cost and consumption information for city electricity accounts. For example, the report identified data for a particular parks and recreation department electricity account for the 12 months covering July 2006 to June 2007, for FY2006-07. In FY2006-07, the HECO data set provided figures for 19,140 monthly city electricity account codes.

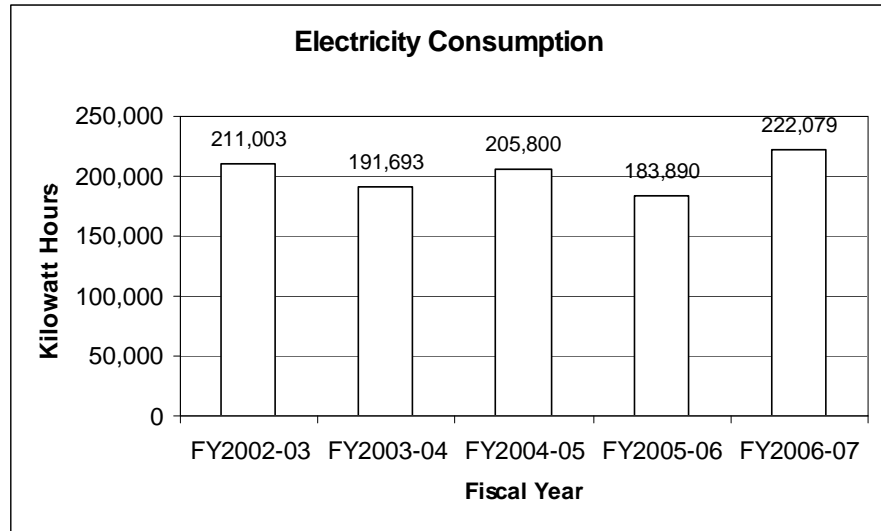
In an effort to further examine electricity cost and consumption over time, we selected a judgmental sample of 100 HECO monthly account codes assigned to city agencies from a population of 19,140 monthly account codes between FY2002-03 and FY2006-07. We emphasize that the city does not have 19,140 separate HECO electricity codes; rather, we

established the population by identifying account codes by month to address any anomalies that may have occurred in other periods during the year. For example, one of the selected codes was a city park for the month of July. For analysis purposes, we examined electricity costs and consumption for this park in the month of July over a five-year period, for a total of five account codes reviewed. Using this methodology, we sought to address any ad hoc events that may occur over the course of an entire year (e.g. time of year, weather, maintenance, etc.).

Sample review showed electricity consumption increased 5.2 percent from FY2002-03 to FY2006-07, but fluctuated over the five-year time period

In FY2002-03, our account code sample consumed a total of 211,003 kilowatt hours versus 222,079 in FY2006-07, or a 5.2 percent increase. This figure is consistent with the city's overall electricity consumption, which increased by 5.7 percent during the same time period. In comparing consumption figures between FY2002-03 and FY2006-07, we found that 47 of 100 account codes (47 percent) saw decreases in consumption. During the same time period, 34 of 100 accounts (34 percent) realized increases in consumption. The largest consumption decrease from FY2002-03 to FY2006-07 was 99 percent, while the largest increase was 828 percent. Overall, the kilowatt hours consumed by the sample of electricity accounts fluctuated throughout the five-year period, as noted in Exhibit 2.5.

Exhibit 2.5
Electricity Consumption
Sample of 100 Electricity Codes
FY2002-03 to FY2006-07

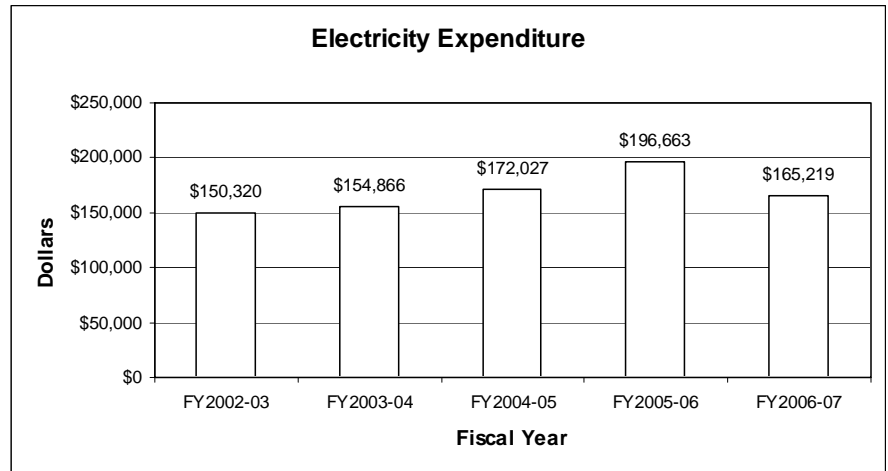


Source: Office of the City Auditor

Electricity expenditures increased 9.9 percent from FY2002-03 to FY2006-07, but FY2006-07 saw a downward expenditure trend

In contrast to our finding that the city's overall electricity expenditures increased by 44 percent between FY2002-03 and FY2006-07, our sample of account codes show an expenditure increase of 9.9 percent, from \$150,320 in FY2002-03 to \$165,219 in FY2006-07. In comparing expenditure figures between FY2002-03 and FY2006-07, we found that 81 of 100 account codes (81 percent) saw increases, while 19 of 100 (19 percent) saw decreases in the same time period. The largest expenditure decrease from FY2002-03 to FY2006-07 was 60 percent, while the largest increase in expenditure was 711 percent.

Exhibit 2.6
Electricity Expenditures
Sample of 100 Electricity Codes
FY2002-03 to FY2006-07



Source: Office of the City Auditor

Exhibit 2.7
Irrigation Booster Pump and Backflow Preventer, Kunia Park



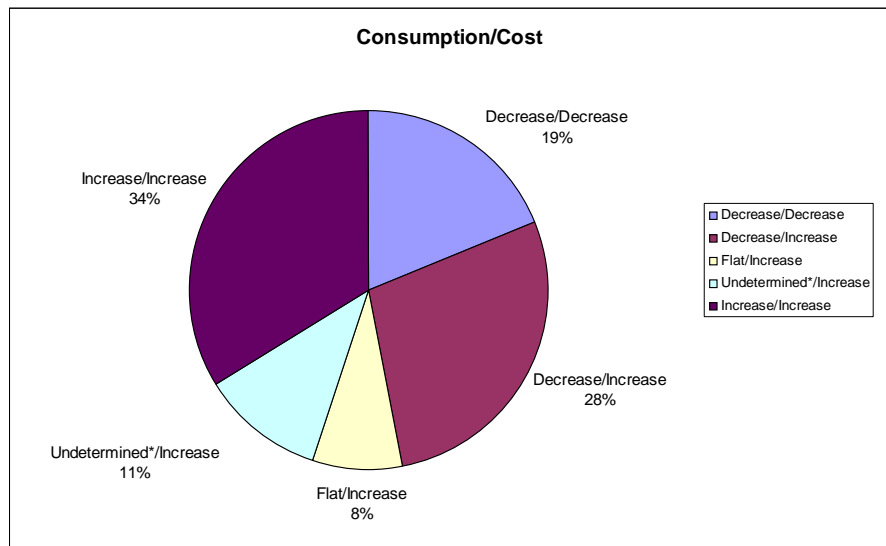
A faulty irrigation booster pump, like the one pictured here at Kunia Park, is the likely cause for the park's electricity cost to rise 711 percent for the month of July 2002 and the month of July 2006.

Source: Office of the City Auditor

Only 19 percent of account codes showed decreases in both cost and consumption; 34 percent showed increases in both

Our sample analysis also revealed that only 19 percent of the account codes experienced decreases in both cost and consumption; 34 percent showed increases in both. Exhibit 2.8 compares cost and consumption data for our sample analysis.

**Exhibit 2.8
Electricity Cost v. Consumption
Sample of 100 Electricity Codes
FY2002-03 and FY2006-07**



* Consumption data not identified

Source: Office of the City Auditor, based on HECO data

A closer analysis reveals other important trends. Of the 19 account codes that saw decreases in both cost and consumption, consumption decreased by an average of 49 percent, but cost decreased by only 23 percent. Conversely, of the 34 account codes that saw increases in both cost and consumption, consumption increased by an average of 48 percent, while cost increased by 45 percent. In looking at electricity consumption only, we found that 49 of 100 account codes experienced decreases in consumption between FY2002-03 and FY2006-07. In this group, consumption decreased by an average of 29 percent, but cost decreased by less than 1 percent.

Overall, this data reveals that although consumption may be on the decline, cost will increase or decrease disproportionately to the rate of consumption. Thus, the city may have to refocus its conservation goals and objectives away from cost *savings* to cost *containment* as the price of electricity appears to outpace the effects of consumption.

Agencies report varying reasons for variations in electricity expenditure and consumption

In our sample analysis, we identified electricity accounts that had the highest and lowest cost and consumption changes between FY2002-03 and FY2006-07 to determine the causes for those variances. In one example, an electricity account for a park in Waipahu had an electricity expenditure of \$25 for the month of July in 2002. In July 2006, the electricity expenditure increased 711 percent to \$203. A Department of Parks and Recreation staff person explained that the park had a faulty irrigation booster pump that wouldn't shut down, which may have caused the increase. In another example, a park in Wai'anae recorded electricity consumption of 677 kilowatt hours in September 2002. In September 2006, that park's account recorded 1,528 kilowatt hours, or an increase of over 125 percent. A parks and recreation department staff person noted that the park's building was renovated in 2003. More lights were added and water coolers were installed. Also, in 2005, the light near the play apparatus was repaired and is running all night long.

Decreases in electricity cost and consumption are also explained. An account code tied to a street light in Waikiki cost the city \$114 in March 2003. In March 2007, the city paid \$58 for electricity, or a 49 percent decrease. A Department of Transportation Services administrator noted that the drop in usage occurred as a result of splitting the service that went to the particular location during infrastructure upgrades in the area. A significant decrease in electricity consumption was also recorded with an electricity account tied to a vertical pump in Manoa. In August 2002, the city used 210 kilowatt hours for operation of the pump. In August 2007, usage decreased 99 percent to 2 kilowatt hours. A Department of Facility Maintenance administrator advised that the Manoa pump is situated in that location because the area is prone to landslides and flooding. The pump is turned on only during severe weather where there is a need to pump out excessive runoff. Thus, this account is used only intermittently, which would explain the consumption variation.

We found that electricity costs and expenditures cannot always be controlled by conservation and generalized electricity policies. In some

instances, faulty equipment will adversely impact electricity use until it can be fixed. In many more cases, increases in electricity are justified by added public health and safety.

City implemented eight formal and other informal electricity conservation projects

Since 2002, the city identified eight formal and several other electricity-related conservation programs:

Honolulu Hale energy conservation improvements

The Honolulu Hale energy conservation project, which was completed in 2002, involved the replacement of 1970's era electric chillers with two high-efficiency centrifugal chillers; the installation of a cogeneration system with a high-capacity absorption chiller; and other infrastructure improvements. The project also included replacement of T-12 linear fluorescent lamps and magnetic ballasts with T-8 fluorescent lamps and electronic ballasts in interior office spaces. Incandescent exit signs were also replaced with more efficient light emitting diode (LED) exit signs. In FY2002-03, electricity consumption was reduced to 1,387,800 kilowatt hours, for savings of about \$110,300 from expenditures made in 2000. Results calculated in May 2005 show that Honolulu Hale continues to save about \$103,600 when compared to the baseline year of 2000.

HECO energy rebates

The city participates in HECO's *Energy Solutions for Business Program*. The program provides energy rebates to organizations that make energy efficiency improvements. The one-time rebates help to lower the cost of the improvements. Qualifying projects include indoor lighting retrofits and lighting controls, premium efficiency motors, and high-efficiency air conditioning. Since the program's inception in 1996, the city has received approximately \$525,145 in HECO rebates.

Light emitting diode traffic signals

In 2002, the Department of Transportation Services installed energy-efficient red and green LED traffic signals at over 400 intersections on O'ahu. These signals replaced incandescent lamps which consume more energy and require replacement more often. Also, the new lights are brighter, which enhance visibility and improve public safety. Annual energy savings totaled about \$313,000 and the city's rebate from HECO was \$162,000.

Lamp and ballast replacement at various city facilities

In 1999, the city began a program to replace inefficient T-12 fluorescent lamps and magnetic ballasts with more energy-efficient T-8 fluorescent

lamps and electronic ballasts at various city facilities, including Fasi Municipal Building, Honolulu Police Department headquarters, Walter Murray Gibson Building, and Fasi Civic Center parking structure. Phase II of the project involved lighting retrofits in 25 fire stations and was completed in 2003. Phase III, which was completed in 2005, placed retrofits in 9 fire stations and 5 police stations.

Ewa Villages Golf Course – off-peak golf cart charging

This project featured the replacement of the electric panels that charge the golf carts with new programmable electric panels. This allows the carts to be recharge during the hours of 9:00 p.m. to 5:00 a.m. to take advantage of HECO's lower off-peak electricity rates.

Neal Blaisdell Exhibition Hall lighting improvements

The project achieved greater efficiency by replacing 134 400-watt lighting fixtures and magnetic ballasts with 350-watt lighting fixtures and electronic ballasts. This project, which received a HECO rebate of approximately \$8,300, is estimated to save the city about \$9,400 annually.

Kapolei Hale air conditioning system upgrades

A new energy management system to control Kapolei Hale's air conditioning, realize energy savings, and improve employee comfort was completed in 2002. This project also involved modifications to the cooling towers, chiller plant, and air handlers. The project qualified for \$24,200 in HECO rebates and has been projected to save the city \$57,000 annually.

Energy services performance contracting for Fasi Municipal Building and Honolulu Police Department Headquarters

This project, which covered two city buildings, replaced the central air conditioning plant in the Fasi Municipal Building and the modernization of the air conditioning system in the police department headquarters. The city estimates that this performance contract will save about \$500,000 annually.

In addition, the city noted that it coordinated an energy awareness campaign in October 2006 to inform, educate, and promote energy conservation among city employees and families. The design and construction department drafted a procurement policy that would require the city to purchase *Energy Star*-qualified products and other energy efficient equipment. Finally, in February 2006, the mayor enacted Ordinance 06-06, which requires all new qualifying city facilities larger

than 5,000 square feet to meet minimum LEED (Leadership in Energy and Environmental Design) Silver Standards, beginning in FY2007-08. LEED is a third-party certification program established by the U.S. Green Building Council and the nationally accepted benchmark for the design, construction, and operation of high performance *green* buildings.

Despite these admirable and ambitious electricity conservation projects, the city's electricity consumption continues to inch upward and its electricity costs skyrocket.

The City's Management of Electricity Costs and Consumption Lacks Full Accountability

City agencies are generally unable to verify whether electricity consumption or cost goals and objectives were achieved. Because responsibility for electricity costs, consumption, and conservation are dispersed among several city agencies, the city lacks a comprehensive framework to effectively manage electricity costs and consumption. The budget and fiscal service department does not fully enforce procurement guidelines related to the purchase of *Energy Star*-rate equipment. Also, the city does not consistently follow best practices in electricity management.

City agencies are generally unable to verify whether electricity consumption or cost goals and objectives were achieved

We examined three electricity-saving projects to determine if goals and objectives were met. We found that city departments do not consistently verify whether intended cost or consumption savings are met. For lighting retrofit projects, savings benefits are assumed, but undeterminable. Electricity monitoring and tracking alternatives are limited and in some instances may undermine cost savings benefits. We also found that the budget and fiscal services department does not follow procurement guidelines to ensure the purchase of *Energy Star* equipment.

City is unable to determine whether Honolulu Hale retrofit goals and objectives were achieved

The Honolulu Hale retrofit program started with an energy study, which was completed in 1999. The project proceeded and was completed in 2002, at an estimated cost of \$2.4 million. Under a performance contract with Johnson Controls, Inc., the contractor guaranteed that in each year of the term following substantial completion, the city would realize energy savings of at least 1,145,456 kilowatt hours. At the time the energy savings were valued at \$94,464. These savings goals were developed using the year 2000 electricity cost and usage as the baseline.

The contractor affirmed that it would collect data related to total building energy use, lighting, circuit power, central plan savings, chiller and cooling tower savings, condenser and primary pumping and cooling tower fan savings, and other equipment. The contractor also agreed to assign a performance assurance specialist to prepare an annual Measurement and Verification Report that would include the energy savings, instruments used, calibration data, and other relevant information. In addition, the contractor would calculate energy savings on a monthly basis and cumulative results would be recorded. According to terms of the contract, savings results may be regularly sent to managers in each department. These results could be posted or circulated to all appropriate parties to ensure their understanding and motivate cooperation.

We requested to review the contractor's verification reports for years FY2002-03 to FY2006-07, as applicable, to determine whether anticipated electricity cost and consumption savings were achieved. A Department of Design and Construction administrator noted that it had only one report on file for FY2003-04, but none since. We requested to review the FY2003-04 report, but a department administrator stated that the agency would request the contractor to prepare reports for other years and would submit all reports to us at a later date. As of March 2008, we had not received any of the requested reports. We asked a department administrator if the contractor missed any of its targeted cost or consumption guarantees. Although the administrator affirmed that the cost and consumption savings were being realized, we found no basis for this affirmation.

The design and construction department administrator noted that it monitors electricity bills to determine if goals are met. Also, a web-based system allows staff to monitor electricity use at various city facilities from their desktop computers. The department takes a broad view in reviewing electricity bills and will take appropriate action when anomalies are identified. Although the design and construction department never provided the Honolulu Hale energy retrofit reports, the budget and fiscal services department reported in a September 2006 communication to the city council that in FY2002-03, Honolulu Hale's electricity consumption was reduced to 1,387,800 kilowatt hours from a 2000 baseline of 2,280,000 kilowatt hours. The calculated savings in FY2002-03 was \$110,300 when compared to the year 2000 baseline cost of \$281,850. However, the *guaranteed* consumption savings provided by the contractor is a savings of 1,145,456 kilowatt hours. Given the FY2002-03 figures reported by the department, the city

realized 892,200 in kilowatt hour savings, which fell short of the guarantee by 316,256 kilowatt hours. The last energy savings calculations reported by the city administration for Honolulu Hale were done in June 2005. The results show that Honolulu Hale continued to save about \$103,600 as compared to the 2000 baseline. Without the contractor's reports or any other relevant data collected by the design and construction department, we question the basis for these figures.

Absent any data from the contractor or the design and construction department, we reviewed Honolulu Hale's billing and consumption data as provided by HECO. We found that in the four years following project implementation, FY2003-04 to FY2006-07, consumption goals were met only once in FY2004-05. Cost savings were achieved three times in FY2002-03, FY2003-04 and FY2004-05, and that in FY2006-07, Honolulu Hale's electricity consumption exceeded the guaranteed maximum usage by 352,856 kilowatt hours and the cost guarantee by \$65,816. We acknowledge that the billing figures provided by HECO are raw numbers that do not factor in any adjustments or variables that might be provided in the city's performance contract, nor does it reconcile with actual expenditures paid by the city. Absent any relevant data from the contractor or the design and construction department, we are unable to definitively determine whether cost and consumption goals have been met.

The Department of Design and Construction, as the contract manager, did not properly enforce the terms of Johnson Controls Inc.'s \$2.4 million performance contract. Without annual reports as required by contract, the department, and the city, has no way to determine if actual cost and consumption goals were met. Moreover, our review of HECO's data for the corresponding years raises potential concerns that guaranteed cost and consumption savings may not have been met in all years.

City is unable to determine whether Ewa Villages Golf Course cart re-charging project goals and objectives were achieved

In 2003, the Department of Enterprise Services implemented an electricity-saving project at the Ewa Villages Golf Course. The project involved the replacement of the electric panels that charge the golf carts with programmable electric panels. The new panels are only energized between the hours of 9:00 p.m. and 5:00 a.m. to take advantage of HECO's lower off-peak electricity rates. The project, which was estimated to cost \$51,056, was projected to save \$4,000 in the first year, and savings of \$7,140 in subsequent years. The project was

anticipated to pay for itself after eight years, in which the city was estimated to have saved \$53,980.

We requested to review project data that would verify whether the projected annual cost savings were being realized. An enterprise services department administrator provided us with golf course electricity expenditure figures for FY2002-02 to FY2006-07. However, the golf course has four separate meters and we asked for clarification as to which meter applied to the golf cart re-charging project. The administrator was unable to provide specific data related to the electricity-saving project.

We found no evidence that enterprise services staff monitored electricity use to determine whether cost or consumption reduction goals were met. While we recognize that the golf course did not have separate meters for its electricity-using equipment and facilities, nevertheless it established specific electricity cost savings goals as a justification for the \$51,056 expenditure in city funds. The department should have developed a way to track its electricity use, determine if cost goals were met, and make adjustments if results were not achieved.

Lighting retrofit project benefits are assumed, but undeterminable

In May 2005, the Department of Design and Construction assisted the Department of Enterprise Services by completing a lighting retrofit project for the Neal Blaisdell Exhibition Hall. This project involved the replacement of 134 400-watt lighting fixtures and magnetic ballasts with 350-watt pulse-start metal halide fixtures and electronic ballasts. This project expected to save approximately \$9,360 annually and received a HECO rebate of \$8,257. The project intended to provide better lighting to attract customers to book events at the hall instead of other venues and more energy efficient lighting.

The project proposed to reduce annual kilowatt hour usage from 186,494 kilowatt hours to 130,103 kilowatt hours and reduce electricity costs from \$30,958 to \$21,597 for an annual savings of \$9,361. The cost of the retrofit equipment was \$71,043, with a simple payback timeframe of 7.59 years.

We spoke with administrators from the Departments of Design and Construction and Enterprise Services and were advised that there is no specific data available to determine whether these objectives had been achieved. A design and construction administrator explained that unless a piece of equipment or group of equipment is separately metered, it is

difficult to isolate performance. The administrator confirmed that the exhibition hall is metered under a single account code with the Neal Blaisdell Arena and attendant facilities, and cannot be separately monitored. An enterprise services administrator further commented that tracking usage is complicated further because electricity consumption at the Blaisdell facilities fluctuates, depending on booking volume and frequency of use. Comparisons over time are difficult to make because bookings and use do not occur at comparable intervals. Thus, the department has no hard data on whether the goals and objectives of the exhibition hall lighting project were achieved. Rather, this energy efficiency project was implemented based on industry projections and the assumed cost savings it will bring.

Electricity monitoring and tracking alternatives are limited and in some instances may undermine cost savings benefits

Currently, the Department of Budget and Fiscal Services' electricity monitoring consists of comparing expenditures with budget allocations on a quarterly basis and reviews of departmental electricity bills. There are no formal reports generated regarding electricity cost or use. Asked if the department calculated the cost savings from the purchase of *Energy Star*-rated equipment, the budget and fiscal department administrator replied that cost savings are intuitive and that quantifying the savings would not be worthwhile since the federal government's *Energy Star* program has already proven to result in cost savings. A Department of Design and Construction administrator also agreed that electricity savings verification or measurement for programs such as *Energy Star* are impractical.

We interviewed the HECO account manager assigned to the city, who confirmed that tracking and monitoring alternatives are limited. The HECO account manager commented that one way to track and monitor specific input points is to hire a third party consultant to perform this activity. However, this is costly and could offset any savings benefit derived from the conservation project. When asked how other organizations track energy cost and consumption, the HECO account manager noted that the organizations simply read meters. HECO offers, at no cost, enhanced monitoring services for qualified facilities where an entity can track usage via the web. Some city facilities, including Fasi Municipal Building, Honolulu Hale, Kapolei Hale, police department headquarters, and others, already have this capability. While we found that the design and construction department utilized this web-based technology to review electricity use in real-time and over periods of time, we further found that it was not effectively used to measure electricity use

against the goals and objectives established by the performance contract for the Fasi Municipal Building. The HECO account manager also commented that installing separate electricity meters at certain facilities would be costly and is contrary to the current customer trend of consolidating, not separating, electricity meters.

We acknowledge the practical limitations and cost prohibitive potential for the city to formally expand its electricity monitoring activities. However, absent any additional effort to isolate, identify, and, at a minimum, estimate cost and consumption savings, the city is unable to determine whether energy-saving initiatives are meeting goals and objectives, whether the benefits are being realized, and whether the dollars spent on these initiatives were justified and prudent. In some instances, such as lighting retrofits, the benefit can be somewhat comfortably assumed. While single-metered equipment such as streetlights can be measured, in other cases, where city departments have established specific cost and consumption savings targets, or where large amounts of tax-payer dollars were used to fund the project, effort should be made to determine whether intended benefits were achieved.

Budget and fiscal services does not follow procurement guidelines for *Energy Star* equipment purchases

In October 2006, the Department of Budget and Fiscal Services transmitted a revised section of its policies and procedures manual reflecting the procurement of *Energy Star* efficient products. The guidelines specify the following:

1. The city is to procure products that meet or exceed *Energy Star* criteria for energy efficiency. Examples of products include: air conditioners, compact fluorescent bulbs, computers, monitors, copiers, DVD recorders/players, printers, scanners, televisions, videocassette recorders, vending machines, and water coolers.
2. Departments and agencies are to incorporate energy efficient criteria into contract specifications and purchase requests.
3. Departments and agencies are to request from the vendor evidence that a product meets or exceeds the *Energy Star* criteria for energy efficiency.
4. Supporting documentation, i.e. product brochure or listing of products from *Energy Star* website, are to be attached to the

purchase requisition, confirming purchase order, or equipment report.

We examined 22 randomly-selected purchase orders for computer-related equipment between October 20, 2006 and June 30, 2007 to determine if these purchases met the requirements imposed by the budget and fiscal services department. We found that none of the 22 purchases, involving hundreds of computers and related equipment, had relevant *Energy Star* documentation. We found no evidence in our review of purchase orders on file with budget and fiscal services that city agencies, including budget and fiscal services (which issued the procurement requirements) appended or requested evidence from their vendor ensuring *Energy Star* compliance. Exhibit 2.9 depicts the findings of our sample analysis.

Exhibit 2.9
Energy Star Procurement Testing Results

	Purchase Date	Dept./ Agency	Product(s)	Was Energy Star Noted in Purchase Documents?
1	10/26/06	Information Technology	37 laptop computers	No
2	12/01/06	Information Technology	25 monitors	No
3	12/28/06	Information Technology	2 laptop computers	No
4	01/19/07	Information Technology	1 laser printer	No
5	12/18/06	Design and Construction	5 desktop computers 21 laptop computers	No
6	02/02/07	Information Technology	15 monitors/15 hard drives	No
7	02/02/07	Information Technology	13 laptop computers	No
8	02/28/07	Information Technology	47 hard drives/47 monitors	Yes*
9	03/23/07	Information Technology	50 laptop computers	No
10	03/27/07	Information Technology	5 laser printers	No
11	05/18/07	Information Technology	2 laser printers	No
12	05/29/07	Information Technology	35 laptop computers 25 monitors	Yes*
13	06/18/07	Design and Construction	4 laptop computers	Yes*
14	06/20/07	Design and Construction	15 monitors	No
15	10/31/06	Police Department	1 scanner	No
16	03/30/07	Police Department	58 monitors	No
17	05/07/07	Police Department	1 computer	No
18	05/25/07	Police Department	1 scanner	No
19	06/20/07	Budget and Fiscal Services	4 notebook computers	No
20	06/26/07	Budget and Fiscal Services	1 laser jet printer	No
21	12/27/07	Enterprise Services	25 laptop computers	No
22	12/14/06	Environmental Services	111 computers/26 monitors	Yes*

* notes that purchase included an *Energy Star*-rated product that was not included in the procurement requirements (e.g. software, adapters, etc.)

Source: Office of the City Auditor

According to a budget and fiscal service's procurement and specifications specialist, most office equipment is purchased from the Western States Contracting Alliance (WSCA), which is a multi-state contracting consortium of state governments, of which the City and

County of Honolulu is a participant. However, the current WSCA contract, which runs through August 2009, states that, “*Energy Star* is a voluntary energy efficiency program sponsored by the U.S. Environmental Protection Agency.” Absent any documentation specific to the city’s purchases, reliance on the WSCA contract alone cannot assure the procurement of *Energy Star*-rated products.

Also, procurement guidelines require that purchases include a list of *Energy Star*-rated products to ensure that the product being requested meets criteria. The budget and fiscal services specialist confirmed that department staff do not consistently reference the *Energy Star* website to ensure that the products requisitioned by city agencies are on the qualified list. The department specialist noted that most of the city’s computer-related products come from a single vendor that features primarily *Energy Star* products, but also acknowledged that procurement documents do not indicate a qualified rating.

The city administration has touted this *Energy Star* policy as an integral part of its conservation effort. However, neither the budget and fiscal services department nor other city departments are ensuring that *Energy Star*-rated products are being purchased. While we found no evidence that the city was not purchasing *Energy Star* products, city agencies should amend their procurement practices to ensure policy compliance.

City lacks a comprehensive framework to effectively manage electricity costs and consumption

While some government jurisdictions across the country have established centralized leadership in electricity management, the City and County of Honolulu does not have a specified agency to manage electricity costs and consumption. As a result, comprehensive, citywide data for effective analysis of electricity management is lacking. Even the city’s *21st Century Ahupua‘a*’s admirable electricity consumption goal lacks a plan for achievement. The budget and fiscal services department, however, has taken a proactive approach in helping city agencies develop electricity budgets.

Other jurisdictions establish centralized leadership in electricity management

In July 1993, the City of Philadelphia created a program to optimize energy use, reduce energy-related expenditures, and foster the development and implementation of energy-efficient technologies in city facilities. Program objectives were achieved with an energy accounting tool and through energy monitoring, resulting in significantly reduced electricity usage. A dedicated city Energy Office was created and by

1995 had grown to five staff and a personnel budget of \$106,000. One of its first projects was to implement an automated energy management system known as Fast Accounting System for Energy Reporting (FASER), which enables staff to review the city's monthly utility bills for inaccuracies or unusual usage levels. Using FASER saved the city \$4.4 million from FY 1993-94 through FY 1998-99. According to the city's administration the success of the energy management department depended on the strong support that the City of Philadelphia's Administration Department gave to the operating departments responsible for implementing the energy programs.

The City of Portland, Oregon is credited with establishing the first local energy policy in the United States in 1990. It established an Energy Office and a citizen's Energy Commission, an approach that was emulated by many communities throughout the nation. Portland's energy policy was based on extensive technical research and broad community involvement from more than 50 public and private organizations. The overall goal was to increase energy efficiency by 10 percent in all sectors of the city and reduce city government's energy bills by \$1 million in ten years. Between 1991 and 2000, the city reduced its energy bills by \$7 million. According to city officials, Portland learned that elected public officials must first frame energy policy for the city government and the community and provide the framework for delivery of programs through partnerships with utilities, businesses, non-profit organizations, and other government agencies.

In addition, the City of Berkeley, California has an Office of Energy and Sustainable Development that facilitates energy efficiency efforts throughout the city, including city-owned buildings. The City of Evanston, Illinois features an Office of Sustainability that focuses on increasing energy efficiency of its buildings and infrastructure. Also, the State of Michigan maintains an Energy Office that promotes energy efficiency and renewable energy resource development to Michigan residents, businesses, and public institutions.

No one city agency is responsible for managing electricity costs or consumption

As noted earlier in this report, the City and County of Honolulu's electricity management functions are dispersed primarily among the departments of budget and fiscal services, design and construction, and facilities maintenance. Although the Department of Budget and Fiscal Services program description claims to monitor energy consumption and reduce costs, we found that it only maintains cost information and pays

electricity bills submitted by city departments and agencies. In addition, the department has jurisdiction over the administration's *Energy & Sustainability Task Force* to address the rising fuel oil prices and its impact to the City's operating budget. The task force's objective was to brainstorm energy reducing initiatives to offset the City's increasing energy costs.

The Department of Design and Construction has the engineering expertise and responsibility to plan, design, and manage energy conservation programs. However, it does not have jurisdiction over all city-owned facilities and has no authority to unilaterally implement an electricity conservation project for facilities outside its jurisdiction. Although the design and construction department serves as a resource for other city agencies, those agencies may be on their own in developing conservation programs.

The city's fragmented energy management structure is contrary to other jurisdictions that have consolidated energy management, created specific energy departments, and realized efficiencies. The city might consider consolidating some or all of its energy management functions to ensure that all of city government's energy needs are addressed in a comprehensive manner.

Comprehensive, citywide data for effective analysis of electricity management is lacking

One of the best practices in energy management cited by the U.S. Environmental Protection Agency and the U.S. Department of Energy's *Energy Star* program is to assess performance by gathering and tracking data. Evaluating energy performance, including electricity, requires information on how, when, and where it is being used. Collecting and tracking this information is necessary for establishing baselines and managing energy use. The data should be complete and accurate because it will be used for goal setting. Specifically, data collection should consider the appropriate level of detail, account for all energy sources, document all energy uses, and include facility and operational data. The program suggests that at a minimum, collect data by fuel type at an individual building or facility level, collect data from submeters if possible, and use actual, not estimated, data whenever available.

We found, however, that the city does not have a single point of data collection. While the budget and fiscal services department maintains electricity billing and expenditure information, it does not collect consumption data. Individual agencies would maintain their own data,

but not all agencies compile this important information. For purposes of this audit, we had to rely on billing and consumption data provided by HECO because no city agency maintained a useable, comprehensive database for electricity cost and consumption. We question how the city administration can formulate citywide electricity policy when it does not have a comprehensive database of cost and consumption information over time. Absent such information, the city is not in a position to establish a solid, citywide electricity use plan. The city administration should consider the recommendations of the *Energy Star* program, of which it is a member, and collect, track, and assess electricity data to formulate an effective electricity policy and establish a basis for future planning.

***21st Century Ahupua‘a* electricity consumption goal lacks a plan for achievement**

In September 2007, the Mayor’s Energy and Sustainability Task Force issued the *21st Century Ahupua‘a*, which is a culmination of the efforts by a working group of city administrators and the mayor’s vision for the future of the City and County of Honolulu. The document’s goal is a Honolulu that is more self-sufficient and sustainable in terms of its infrastructure and operations, and one that is more in harmony with our island environment. The sustainability plan is intended to keep the city among the leaders in sustainable practices, energy conservation, and responsible environmental stewardship. One of the plan’s noteworthy objectives is to reduce electricity consumption in existing city public buildings by 10 percent from FY2006-07 to FY2016-17 as compared to FY2004-05 baseline data.

We interviewed the task force chair, who is also the director for the budget and fiscal services department, and requested to review data that the task force used to establish the sustainability plan’s conservation goals and objectives. The task force chair did not provide data, but directed us to the chair of the electricity issues team from the design and construction department for the information.

We spoke with the design and construction’s contact person for this audit and asked what kind of data the team used to establish the 10 percent reduction goal over ten years. The department administrator noted that the team reviewed similar plans established by other municipalities. The team decided that the 10 percent goal seemed reasonable and attainable, given the city’s current operation. We also asked for clarification on how the 10 percent reduction goal would be applied. The administrator conceded that the application is unclear and,

in fact, this very issue came up during the task force's meeting in December 2007 and would be discussed again.

While we commend the administration and the task force for establishing a defined electricity consumption goal that is measurable over time, we are concerned about the apparent lack of an implementation plan. Although, this sustainability plan became effective in FY2006-07, we found no clear definition as to what city facilities are, and are not, subject to the 10 percent reduction, and what the affected departments must do to achieve the goal. Furthermore, there is cause for concern since we found no evidence that the team has begun measuring progress since there is no apparent tracking or monitoring plan in place. Until the task force formalizes an action plan, the council and taxpayers have no assurance that the 10 percent reduction in electricity usage will be accomplished.

Budget and fiscal services issued electricity budgeting guidelines to all agencies in 2007

Despite falling short in electricity management and planning as cited previously in this report, we note that the budget and fiscal services department has made a concerted effort to assist city agencies in preparing electricity budgets. According to a department administrator, budget and fiscal services began providing electricity budget guidelines to city agencies starting in FY2006-07. The department initiated these guidelines because some agencies consistently under-projected their electricity costs. Prior to FY2006-07, the budget and fiscal services department did not issue any guidance to city departments. Exhibit 2.10 depicts the department's electricity budgeting guidelines from FY2002-03 to FY2006-07.

Exhibit 2.10
Electricity Budgeting Formulas for City Agencies
Department of Budget and Fiscal Services
FY2002-03 to FY2007-08

<i>Fiscal Year</i>	<i>Budgeting Formula</i>	<i>Basis for Formula</i>
FY2002-03	None	None
FY2003-04	None	None
FY2004-05	None	None
FY2005-06	None	None
FY2006-07	(Projected June 2006 rate + 21.3 percent) x estimated consumption in FY2006-07	Most recent rate or actual monthly payment in December 2005 + 3 percent per month increase through FY2006-07, annualized.
FY2007-08	(December 2006 rate + 20 percent) x estimated consumption in FY2007-08	Rate dropped by 11 percent from July 2006 to December 2006. A 20 percent increase over December 2006 rate provides for the rate to return to the July 2006 level, plus approximately 9 percent additional increase to cover the proposed 7 percent Public Utilities Commission rate increase.

Source: Department of Budget and Fiscal Services

In prior years, larger agencies with substantial electricity bills (design and construction, facilities maintenance, and environmental services) received direct assistance from budget and fiscal services. Oftentimes, these agencies also have a good working relationship with HECO, so they generally had a better handle on electricity budgets. For smaller agencies, or those with smaller electricity budgets, budgeting relied primarily on the previous year's expenditures (electricity bills) as a basis for the next year's budget. The guidelines provided to all city agencies establish a formula based on both expenditure and consumption.

Our survey of city agencies showed that for the collective period FY2002-03 to FY2006-07, four agencies' electricity expenditures exceeded their appropriations: Honolulu police department (181 percent), emergency services department (111 percent), Honolulu fire department (110 percent), and parks and recreation department (102 percent). The police department and emergency services department exceeded their electricity appropriations in each of the five fiscal years

between FY2002-03 to FY2006-07. Exhibit 2.11 identifies city departments that significantly exceeded annual electricity appropriations between FY2002-03 to FY2006-07.

Exhibit 2.11
Examples of City Departments that Significantly Exceeded
Annual Electricity Appropriations
FY2002-03 to FY2006-07

<i>Department</i>	<i>Fiscal Year</i>	<i>Amount Appropriated</i>	<i>Actual Expenditures</i>	<i>Amount Spent Beyond Appropriation</i>
Facility Maintenance	FY2002-03	\$3,116,290	\$3,433,906	\$317,616
Facility Maintenance	FY2003-04	\$3,236,683	\$3,580,231	\$343,548
Facility Maintenance	FY2004-05	\$3,468,493	\$3,835,491	\$366,998
Design and Construction	FY2004-05	\$3,540,000	\$3,940,956	\$400,956
Design and Construction	FY2005-06	\$4,600,121	\$4,925,416	\$325,295
Parks and Recreation	FY2005-06	\$2,742,000	\$3,395,411	\$653,411

Source: Office of the City Auditor

We commend the budget and fiscal services department for providing electricity budgeting guidelines to all city departments. Hopefully, better planning will result in electricity budgets that more accurately reflect each agency's needs and restore fiscal responsibility in the budgeting process. We urge the budget and fiscal services department to maintain this very important planning tool.

City agencies do not consistently follow best practices in electricity management

The federal government's *Energy Star* program outlines best practices in energy management. We surveyed city agencies to determine compliance with eight select best practices in electricity management and found that compliance varied. Best practices such as routine electricity or billing audits and better communication about electricity goals and achievements warrant further attention.

Survey of city agencies showed mixed results in adhering to best practices

We selected eight management best practices recommended by the federal government's *Energy Star* program and surveyed city agencies to determine compliance. We found that the three best practices most commonly performed by city agencies are purchasing of *Energy Star*-rated equipment, assigning an individual or team dedicated to manage department electricity cost and consumption, and gathering, tracking, and analyzing electricity data. The best practices least commonly performed by city agencies are providing incentives or recognition for meeting electricity cost and consumption goals, providing staff with specialized training in electricity management, communicating electricity performance goals and reporting outcomes to department staff, and adhering to a formal energy policy with set performance goals.

The Department of Enterprise Services reported that it adhered to seven of eight select best practices, followed by the Department of Design and Construction with six of eight best practices, and the Department of Parks and Recreation with four of eight best practices. The Customer Services Department and Honolulu Police Department each complied with only one of eight best practices. On average, city agencies complied with two of eight best practices. Exhibit 2.12 reveals various city agencies' compliance with select best practices in energy management.

Exhibit 2.12
City Agencies' Compliance with *Energy Star* Recommended Best Practices

BEST PRACTICE	DEPARTMENT												Total
	CSD	DEM	HFD	DCS	DES	ESD	DDC	HPD	DTS	DPR	ENV	DFM	
Energy audit conducted by energy professionals					X		X		X			X	4
Assigned individual or team dedicated to manage department electricity cost and consumption	X	X			X		X		X	X			6
Adhere to a formal energy policy with set performance goal			X		X					X			3
Gather, track, and analyze electricity data		X			X		X			X		X	5
Communicate electricity performance goals and report outcomes to department staff					X		X			X			3
Provide staff with specialized training on electricity cost and consumption goals					X		X						2
Provide incentives or recognition for meeting electricity cost and consumption goals													0
Purchase and use <i>Energy Star</i> rated equipment			X		X		X	X	X			X	6
Total	1	2	2	0	7	0	6	1	3	4	0	3	

Legend:

CSD – Customer Services Department	DDC – Department of Design and Construction
DEM – Department of Emergency Management	HPD – Honolulu Police Department
HFD – Honolulu Fire Department	DTS – Department of Transportation Services
DCS – Department of Community Services	DPR – Department of Parks and Recreation
DES – Department of Enterprise Services	ENV – Environmental Services Department
ESD – Emergency Services Department	DFM – Department of Facility Maintenance

Source: Office of the City Auditor

While we recognize that not every best practice suggested by the *Energy Star* program may be applicable, nevertheless, city agencies should consider implementing these suggested best practices. City administrators already acknowledge the proven value of the *Energy Star* program and should consider implementing more of their recommendations. As a result, the city may realize greater efficiencies in electricity management.

Electricity/billing audits are not routinely scheduled

Energy audits are comprehensive reviews conducted by energy professionals and/or engineers that evaluate the actual performance of a facility's systems and equipment against their designed performance level or against best available technology. The federal government's *Energy Star* program recommends periodic assessment of an agency's equipment performance, processes, and systems to help identify opportunities for improvement. However, we found that the city has not conducted a comprehensive citywide energy audit in over 20 years.

In 1981, the City and County of Honolulu commissioned an energy audit of the municipal office building (Fasi Municipal Building). The purpose of the audit was to identify the building's major energy consuming devices. The audit identified fixtures that could be disconnected and a potential energy savings of 874,380 kilowatt hours per year at an annual cost savings of \$51,590. The report also outlined six specific recommendations to achieve the identified cost savings.

In 1984, the city commissioned two other energy audits. The first audit, which assessed the Pearl City Police Sub-Station, identified potential cost savings of \$5,736 per year in air conditioning, lighting, and water heating adjustments. The report also noted that the most important and potentially biggest energy savings could be realized by proper maintenance of all equipment on a continuous basis. The second energy audit covered the Pawa'a Fire Sub-Station. This audit identified \$3,379 in potential annual cost savings.

In 1998, the city engaged TriStem Ltd. to perform a utility billing audit. The audit sought to determine whether amounts paid to telephone and electricity utility companies were correct. The contract specified that the contractor analyze billing data for up to four years, research and perform field checks as necessary to verify that incorrect billings were made, and report all findings to the city. The contractor found 160 street lights in HECO's inventory that were not found in the field, and 71 lights found in the field that were not in HECO's inventory. The Department of Design

and Construction completed its own analysis and found additional discrepancies. In the end, the city found that HECO billed the city for 229 street lights that were not in the city's inventory; however, the city also identified 262 city-owned street lights that were not billed by HECO. The net result from the TriStem testing and the design and construction department's follow-up review is that there were more streetlights in the field that were not on HECO's billing inventory. The net effect of the adjustments that were made as the result of this billing audit was that the city paid more for the previously unaccounted for street lights, but the inventory is now accurate.

Given the city's past practice in engaging professionals to conduct energy and billing audits, we sought to determine whether such audits would be scheduled at regular intervals or when such audits would be conducted in the near future. City administrators from the budget and fiscal services and design and construction departments confirm that the city has no plans to conduct any future energy audits, nor do any city agencies have the expertise to conduct such audits in-house.

Given the potential benefit of energy and utility billing audits, we are concerned that the city no longer includes such audits as part of its energy management program. While the city may not always realize cost savings (the TriStem utility billing audit actually cost the city more) the benefit of having an accurate inventory of energy-consuming equipment is worthwhile. Energy studies related to performance contracts aside, we urge the administration and council to consider funding periodic energy or utility billing audit to ensure that the city's electricity consumption is managed efficiently.

City does not consistently communicate electricity management results to stakeholders

The *Energy Star* program notes that effective energy programs make employees, managers, and other key stakeholders aware of energy performance goals and initiatives, as well as their responsibility in carrying out the program. Many organizations have found that informed employees are more likely to contribute ideas, operate equipment properly, and follow procedures—all helping to ensure that capital investments in energy improvements will realize their potential. Training is particularly important as it helps staff to understand the importance of energy performance and provides the information necessary to make informed decisions.

As noted previously in this report, we surveyed city agencies about their electricity management practices. We found that only 3 of 12 agencies responding to our energy management survey noted that they communicated electricity performance goals and reported outcomes to department staff. The survey also found that only 2 of 12 responding agencies provide staff with specialized training on electricity cost and consumption goals, and none of the responding agencies provide incentives or recognition for meeting electricity cost and consumption goals.

The city's sustainability plan to reduce electricity consumption by 10 percent in existing city public buildings between FY2006-07 and FY2016-17 presents an ideal opportunity for the mayor's Energy and Sustainability Task Force, in conjunction with appropriate city agencies, to report on the city's progress in meeting this goal. We urge city agencies to take every opportunity possible to include employees in the energy management planning process and in the success or shortcomings in meeting energy cost and consumption objectives.

Conclusion

Between FY2002-03 and FY2006-07, the city saw its electricity costs escalate 44 percent, even though consumption was held to a mere 6 percent increase. As the cost of oil increases, the city can expect its electricity costs to continue rising. Because Honolulu is served by a single electricity provider, there is little the city can do to control the cost of electricity. We acknowledge that the city has implemented several energy conservation projects intended to save both electricity cost and consumption. On an individual basis, these projects may have achieved some savings, even though we point out in this report that identifying the actual savings may be elusive. But given the present economic environment and factors outside the city's control, even if these projects were to hit their targets, it may not be enough to significantly impact the city's entire electricity budget. Thus, energy conservation projects need to be recognized more for their *cost containment* opportunities rather than *cost savings* benefits.

The city has proactively implemented initiatives to address the city's escalating energy costs. The mayor's energy task force, and its 21st Century Ahupua'a sustainability plan, establishes a measurable goal for electricity conservation. City staff are active participants in the *Rebuild Hawai'i Consortium* and the federal government's *Energy Star* program. In FY2006-07, the budget and fiscal services department

began providing all city agencies with guidelines to help bring consistency in electricity budgeting. Lighting and other energy-conservation retrofit projects such as Honolulu Hale, Fasi Municipal Building, Honolulu Police Department Headquarters, and other smaller projects were implemented with an expectation of reduced electricity consumption and, to some extent, cost containment. While these efforts are commendable, we are concerned about some of the actions, or *inactions*, of city agencies.

The city's current fragmented structure, which assigns electricity management responsibilities to various city agencies, may be the source for inefficiency. Electricity conservation and management initiatives are inconsistent and left to the priorities set by the respective agencies. As a result, there is no comprehensive, citywide program for electricity management, which is contradictory to the citywide goals established by the *21st Century Ahupua'a*. The city lacks a framework to collect comprehensive electricity consumption data to even begin developing a citywide approach toward energy management. Additionally, city agencies do not proactively track, monitor, and report energy consumption and cost data. Moreover, agencies that implement electricity-conservation initiatives are unable to determine whether the electricity cost and consumption goals were met or lack the ability to verify whether the investment of tax dollars was worthwhile. While there are some limitations in how cost and consumption can be tracked, under current practices, the city is taking a *leap of faith* for many of its conservation and certain retrofit initiatives. Finding the right balance between accountability and preserving any cost benefit realized from these conservation projects is both an opportunity and a challenge. With better data monitoring, planning, and communication, we believe the city can improve its already solid efforts in reducing electricity consumption and conserving financial resources.

Recommendations

1. The mayor should:
 - a. Continue efforts to contain electricity cost and reduce consumption.
 - b. Consider consolidating energy management duties under a single entity to ensure a citywide approach to managing electricity cost and consumption.

- c. Require the Mayor's Energy and Sustainability Task Force to develop an action plan for meeting the 10 percent reduction in electricity consumption for the city's existing public buildings between FY2006-07 and FY2016-17.
2. The managing director should:
 - a. Develop a monitoring strategy to ensure that all city agencies' cost and consumption saving goals are met if general funds are used to implement an electricity conservation program.
 - b. Consider implementing electricity management best practices which include, but are not limited to, reporting electricity management results to employees, providing training and recognizing those meeting electricity cost and consumption goals and objectives, and funding periodic electricity or billing audits.
 - c. Compile data and produce a comprehensive annual report on the city's overall electricity cost and consumption that identifies annual electricity cost and consumption by department, energy conservation projects implemented, comparative data showing the estimated and actual cost and consumption savings, justification for any significant increase or decrease in electricity consumption for the year, and any steps taken to reduce electricity cost and consumption. If actual cost and consumption data cannot be determined, the agency(ies) should provide an estimate and its methodology in calculating the estimate. The report should be transmitted to the city council.
 - d. Examine design and construction's oversight of Johnson Controls Inc.'s performance contract, missing deliverables, and determine whether the contractor owes the city money.
 3. The Department of Budget and Fiscal Services should:
 - a. Enforce provisions of its policies and procedures manual related to the purchase of *Energy Star*-rated products by amending its vendor agreements and ensuring that agencies provide evidence of purchases' *Energy Star*-rating where applicable.
 - b. Continue to provide city agencies with guidance in formulating electricity budgets.

4. The Department of Design and Construction should enforce all performance contract requirements, including annual monitoring and verification reports, and ensure that the city collects funds from contractors that do not meet electricity cost and consumption guarantees.

Response of Affected Agencies

Comments on Agencies' Response

We transmitted a draft of this report to the departments of Budget and Fiscal Services, Design and Construction, Facility Maintenance, and the managing director. Copies of the transmittal letters are included as Attachment 1. We informed the agencies that a written response to our draft was due on Thursday, July 3, 2008. On June 24, 2008, the budget and fiscal services' director requested an extension to submit its response. The city auditor granted the extension request and authorized a submission date of July 17, 2008. The budget and fiscal services department submitted a consolidated written response to the draft report on July 16, 2008, which is included as Attachment 2.

In its written response representing affected agencies, the budget and fiscal services department director expressed appreciation for the report's recognition of the many accomplishments the city has made to reduce electricity consumption and provided other details regarding some of those initiatives. The director also expressed concerns regarding the report's scope and methodologies. In addition, the agencies' response provided clarifying comments on certain issues raised in our audit, some of which we discuss below.

The budget and fiscal services' director expressed concern over the audit's limited scope and selective testing. Specifically, the agencies questioned why our audit did not focus on electricity cost, consumption, and management issues of certain city agencies as part of our "citywide" review. While we believe that the audit's "citywide" audit objectives were clear, we amended the scoping statement to clarify the audit's scope and intent.

Additionally, the budget director clarified that HECO provided us with billing data, which is different from actual expenditure data maintained by the budget and fiscal services department. Our draft report did not distinguish the differences between the two data sets. We amended the final report accordingly.

The budget director also provided clarifying information regarding the design and construction department's use of a web-based system to monitor electricity use in real-time form. While we acknowledged the department's use of the technology to review data in real-time and over

periods of time, we amended our report and clarified that the technology was not effectively used to measure goals and objectives stated in the Fasi Municipal Building performance contract.

We also made other non-substantive amendments for purposes of clarity and style.

The budget director took exception to our finding that the test review of 22 purchase orders for computer and other related purchases did not contain proper *Energy Star* documentation and that our report did not reference the WSCA master agreement section related to *Energy Star* procurement. We note that budget and fiscal services staff did not present us with a copy of the master agreement section related to *Energy Star* procurement. Rather, we were given a copy of the WSCA contract section titled, “Computer Equipment, Software, Peripheral and Related Services,” which cites the *Energy Star* program as “voluntary.” Furthermore, budget and fiscal services procurement policies still require that city agencies request vendors to provide evidence that the purchases meet or exceed *Energy Star* standards, “which are to be attached to the purchase requisition, confirming purchase order, or equipment report.” We found no such evidence and stand by our finding.

In addition, the budget director disagreed with our finding that the city is unable to determine whether Honolulu Hale retrofit goals and objectives were achieved. The director’s response notes that the design and construction department monitors electricity bills to determine if goals are met and that the contractor’s annual verification reports were secondary. The director also comments that the contractor has since submitted applicable annual verification reports for the audit’s five-year review period. We do not dispute the department’s evaluation of monthly electricity bills or the use of a web-based monitoring system. However, we found no evidence that the monitoring was tied to the performance contract goals and objectives. The performance contract contains specific performance targets and requires the contractor to report on how it met those performance goals. We requested to review the contractor’s annual verification reports issued during our review period, but the design and construction department was unable to provide them. By not having, or requiring the timely submittal of these reports, we question how the department knows if the established performance contract goals were met and its accountability for the \$2.4 million spent on the retrofit project.

The budget director also refuted our finding that the *21st Century Ahupua‘a* section related to *Energy Conservation* lacked an implementation plan. The director referenced a section in the draft report as the implementation plan, noted that Version 1.1 of the document was released in April 2008, and that a workshop was held in June 2008 to gather information and establish an electricity baseline using FY2004-05 data. While we commend the department for moving forward with the *21st Century Ahupua‘a* provisions, we stand by our finding. We reiterate that the electricity conservation plan covers the 10-year period FY2006-07 to FY2016-17. Thus, this project was effective July 1, 2006. The city conducted a workshop in June 2008 to gather information to establish the FY2004-05 electricity baseline. Based on this sequence of events, nearly two years have already elapsed. By our calculation, the city now has eight years to implement a plan and achieve its desired 10 percent reduction. Furthermore, Version 1.1 of the plan was released after our fieldwork ended. It is important to note that we did not find non-compliance with the proposed electricity reduction goals nor did we predict failure. We merely expressed concern about the lack of specifics for a 10-year project that commenced over two years ago.

Finally, the budget director’s response cites various instances where our audit should have provided more information or additional detail, or areas where the audit might have been more helpful to the departments. We agree that more information and analyses regarding the city’s electricity cost and consumption would have been helpful. However, compiling data and conducting comprehensive analyses is the primary responsibility of the departments and the executive branch, and not the city auditor. We are pleased that the responding agencies recognize the need for better information collection, analyses, and dissemination, and hope that the city administration will adopt our recommendation to compile a comprehensive annual report that will provide this vital information.



OFFICE OF THE CITY AUDITOR
CITY AND COUNTY OF HONOLULU
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LESLIE I. TANAKA, CPA
CITY AUDITOR

June 19, 2008

COPY

Mr. Wayne Hashiro
Managing Director
City and County of Honolulu
530 South King Street, 3rd Floor
Honolulu, Hawai'i 96813

Dear Mr. Hashiro:

Enclosed for your review are two copies (numbers 11 and 12) of our confidential draft audit report, *Audit of the City's Electricity Costs, Consumption, and Management*. If you choose to submit a written response to our draft report, your comments will generally be included in the final report. However, we ask that you submit your response to us no later than 12:00 noon on Thursday, July 3, 2008.

For your information, the mayor, the Department of Budget and Fiscal Services, the Department of Design and Construction, the Department of Facility Maintenance, and each councilmember have also been provided copies of this **confidential** draft report.

Finally, since this report is still in draft form and changes may be made to it, access to this draft report should be restricted. Public release of the final report will be made by my office after the report is published in its final form.

Sincerely,

A handwritten signature in cursive script, appearing to read "Leslie I. Tanaka".

Leslie I. Tanaka, CPA
City Auditor

Enclosure

DEPARTMENT OF BUDGET AND FISCAL SERVICES
CITY AND COUNTY OF HONOLULU
 530 SOUTH KING STREET, ROOM 208 • HONOLULU, HAWAII 96813
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MUFI HANNEMANN
 MAYOR



MARY PATRICIA WATERHOUSE
 DIRECTOR

MARK K. OTO
 DEPUTY DIRECTOR

July 16, 2008

'08 JUL 17 A8 :24

Mr. Leslie I. Tanaka, CPA
 City Auditor
 1000 Uluohia Street, Suite 120
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C & C OF HONOLULU
 CITY AUDITOR

Dear Mr. Tanaka:

Subject: Consolidated response to draft Audit of the City's Electricity Costs,
 Consumption, and Management

Thank you for the opportunity to submit a response to the confidential draft report titled "Audit of the City's Electricity Costs, Consumption, and Management" prepared by your office. We appreciate your reference to the many projects the City has completed to significantly reduce electricity consumption. We also concur with your conclusion that *"the city has proactively implemented initiatives to address the city's escalating energy costs"*.

Over the years the City has implemented many electricity conservation projects that have had a significant positive effect on electricity consumption. The City also recognized many years ago the need to develop a framework for managing energy conservation efforts. The framework has evolved and is currently incorporated into the 21st Century Ahupua`a Energy and Sustainability Plan.

The framework and management structure provided by the 21st Century Ahupua`a is of significant benefit to the City's electricity conservation and cost containment efforts and encourages the effective implementation of energy conservation best practices. The 21st Century Ahupua`a is a framework centered on a multi-departmental Mayor's energy and sustainability task force that includes all key agency managers. The task force is further focused through working groups one of which, the energy conservation working group, is specifically dedicated to electricity conservation.

The 21st Century Ahupua`a has received national recognition. Honolulu was recently recognized by the United States Conference of Mayors as one of five cities with outstanding sustainability programs out of 70 large cities from around the nation. A copy of the communication regarding the outstanding achievement award is attached for your reference in Appendix 2.

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The energy conservation working group's objective is to reduce electricity consumption in existing public buildings by 10 percent prior to the end of FY 2017. The goal was developed through the 21st Century Ahupua'a framework and is included in the program planning documents, see plan excerpt in Appendix 3. The entire document is available at www.honolulu.gov/mayor/ahupuaa/plan.htm.

The primary concern we have with the draft report is that there are significant audit limitations that are not consistent with the audit objectives of a review and assessment of citywide electricity expenditures and city management of electricity consumption. The audit report indicates that the City Auditor office lacks the resources to perform a comprehensive electricity audit. The report excludes significant electricity consuming City departments from the audit, and sample testing was relied on without follow-up analysis to form audit conclusions. These limitations contribute to the auditor relying on partial or inaccurate information to form many of the opinions and conclusions in the draft report. At a minimum, the audit limitations need to be clearly stated up front in the report so that users of the report can be adequately informed, and there is also a need to address inaccurate information prior to issuing the final report.

The selective testing and lack of analysis misleads the reader and misrepresents the actual results that have been attained by the City energy savings efforts. A couple of examples are provided below:

Lack of electricity consumption data analysis misrepresents conservation efforts.

The City electricity conservation efforts are properly focused on electricity consumption reduction. Had the audit analyzed electricity consumption data or had the City Auditor staff consulted with the City on electricity consumption the following results would have become clearly evident.

The 5.7% increase in annual electricity consumption as reported on page 11 of the draft report is comprised of two distinct components: electricity consumption increases for new services and structures and significant electricity savings efforts at existing facilities.

During the audit period, the City expanded services and brought on new public facilities. New facilities included the Honolulu Fire Department Headquarters, the East Honolulu Police Station, the Kapolei Corporation Yard, and new emergency ambulance facilities in Kalihi and Kapolei. The City also constructed 45 new traffic signalized intersections and school warning flashers that provide safer streets for our motorists and pedestrians.

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In addition, the City upgraded effluent treatment at its Sand Island Wastewater Treatment Plant. The project, completed in FY 2006, required expansion of the electrical infrastructure at Sand Island to support ultraviolet disinfectant lights. The upgrade consumes a significant amount of electricity. Consumption increases between FY 2002-2003 and FY 2006-2007 totaled at least 13.9 million kWh or 10% of FY 2002-2003 consumption. The Sand Island upgrades alone accounted for a 6% increase in City electricity consumption beginning in FY 2005-2006.

Energy savings projects, many identified in the draft report, generated annual energy savings of approximately 5 million kWh or 4% of FY 2002-2003 consumption. These results are exclusive of the substantial amount of rebates received from HECO over the years and the Honolulu Hale energy conservation improvement project that produced annual energy savings of approximately 1 million kWh and was completed prior to FY 2002-2003.

City is committed to the Energy Star program and purchasing energy star products.

The City has implemented many best practices and will continue to pursue implementing additional best practices of the Energy Star and other energy management programs that are evaluated as beneficial to the City.

Energy Star products, especially computer equipment and accessories, are being purchased by the City and Energy Star documentation does exist. All of the computer equipment purchased as identified in the audit sample, Exhibit 2.9 page 33 of the draft report, were Energy Star compliant and did include Energy Star documentation.

The draft report on page 33-34 properly identifies that the City uses the Western States Contracting Alliance master price agreement when computer equipment and accessories are purchased. However, the draft audit report does not include any reference to the master agreement section 17 C Energy Efficiency Programs that requires the contractor to provide products that meet the Energy Star or other recognized programs for energy efficiency, see Appendix 4. The contract language constitutes documentation and the audit conclusion is inaccurate.

A number of other significant concerns and comments have been generated regarding statements and data included in the draft report. These concerns and comments are included in Appendix 1. We have consolidated all of the feedback from the City departments included in the audit (DDC, DFM, BFS) into a single response. We believe a single response will facilitate your effort to address the issues prior to finalizing the audit report.

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We value the independent assessment function provided by the City Auditor office. However, we would like to make sure all facts and data are considered when opinions are formed regarding City operations. We are hopeful that you will use this response to address the issues raised prior to issuing the final report.

Very truly yours,



Mary Patricia Waterhouse
Director

MPW:ve

Attachments

APPROVED:



Wayne M. Hashiro P.E.
Managing Director

cc: DDC Director
DFM Director
Mayor

Appendix 1

Response to Audit of the City's Electricity Costs, Consumption, and Management

Page 9, Chapters 1, Audit Objectives

Audit statement: Review and assess citywide expenditures for electricity and city's management of electricity consumption.

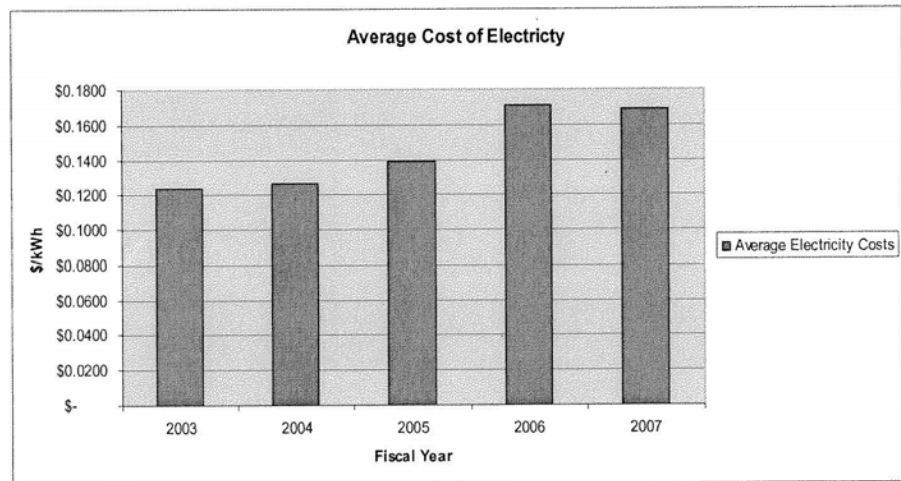
City Response: The audit objectives indicate a citywide audit approach. However the audit excluded many significant city departments and facilities, including Department of Parks and Recreation and the Environmental Services Department.

Page 11, Chapter 2, Summary of Findings

Audit statement: Although the city's electricity consumption increased 5.7 percent over our five-year review period, expenditures soared by 44 percent.

City Response:

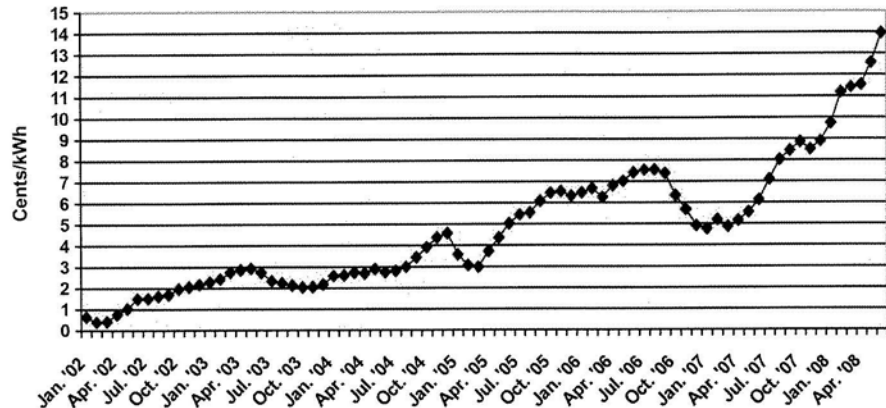
The City Auditor notes that the expenditures for electricity increased by 44 percent over the audit period. However, the audit does not mention the obvious reason for this increase, which is the rising cost of electricity. The chart on the right was created using the same Hawaiian Electric Company (HECO) data that was provided to the City Auditor. The chart represents the average annual cost of electricity from FY 2003 to FY 2007. In FY2003, the cost to the City for its electricity usage was \$0.1240/kWh, while in FY2007; the cost to the City for its electricity usage was \$0.1690/kWh. This 36% increase in electricity cost tracks closely the 44% increase in the City's expenditure. The chart is similar to the City Auditor's Exhibit 2.1 shown on page 13.



The City Auditor also does not explain the reason for the increase in the cost of the electricity that the City purchases from the HECO. HECO primarily uses crude oil to generate electricity in its power plants. HECO is regulated by the PUC and is allowed to pass along the fuel oil costs to its customers.

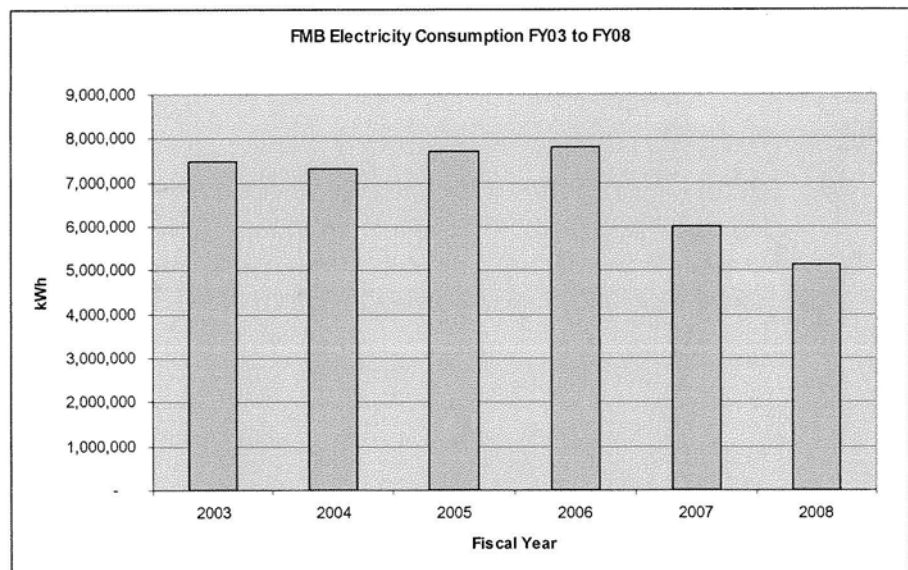
Fuel Oil Adjustments - 2002 thru 2008

The chart on the right tracks the increase in the fuel oil adjustment, which is added to the base cost of electricity. This chart coincides with the audit period. In July 2002, the surcharge above the base electricity rate was \$0.01/kWh. The current surcharge is \$0.14/kWh, which represents at 1400% increase.



The City Auditor also notes that the City's electricity consumption increased by 5.7 percent over the audit period. However, the City Auditor does not analyze the reason for this increase. During the audit period, the City expanded its services to the people of Honolulu. New public service facilities were brought on-line. These include the Honolulu Fire Department Headquarters, the East Honolulu Police Station, the Kapolei Corporation Yard, and new emergency ambulance facilities in Kalihi and Kapolei. The City also constructed 45 new traffic signalized intersections and school warning flashers that provide safer streets for our motorists and pedestrians. In addition, the City upgraded effluent treatment at its Sand Island Wastewater Treatment Plant. During FY2005-2006, the City upgraded the electrical infrastructure at Sand Island to support ultraviolet disinfectant lights, which consume a significant amount of electricity.

During the audit period there were also many significant energy savings projects implemented. One example is the FMB energy conservation improvement project, implemented between FY2006 and FY2007. The project reduced our annual electricity consumption by approximately 2 million kWh/year. The chart below presents electricity usage for the facility during the audit period.



Page 16, Chapter 2, The City's Electricity Expenditures Rose Significantly Despite Ongoing Conservation Efforts

Audit statement: We note that expenditure figures reported by HECO for FY2006-07 are about \$1.4 million higher, or five percent, than figures provided by the budget and fiscal services department....In this case, a comprehensive electricity or billing audit might be able to explain whether the discrepancies are a matter of accounting formats or something more significant.

City Response: All that was needed to explain the difference was a quick analysis of the HECO and City data, not a comprehensive electricity audit. There are two specific reasons for the difference. First, the HECO data is comprised of billing data, not expenditure data. Exhibit 2.1 on page 13 of the draft report should be changed to accurately reflect the data source. Secondly, the HECO data includes Oahu Transit Services (TheBUS and HandiVan) electricity accounts not included in the City data.

Page 27, Chapter 2, Summary of Findings – City is unable to determine whether Honolulu Hale retrofit goals and objectives were achieved

Audit statement: We requested to review the contractor's verification reports for years FY2002-03 to FY2006-07, as applicable . . . A DDC administrator noted that it had only one report on file for FY2003-04, but none since. As of March 2008, we had not received any of the requested reports.

Although the administrator affirmed that the cost consumption savings were being realized, we found not basis for this affirmation.

The design and construction department administrator noted that it monitors electricity bills to determine if goals are met.

City Response: The City Auditor properly states that the DDC administrator monitors the electricity bills to determine if the goals are met. This is the primary manner that DDC determines that goals are met. Receiving reports from the contractor are secondary. The contractor has submitted the reports to the City and the reports are currently available for review by the auditor.

Page 28, Chapter 2, Summary of Findings – City is unable to determine whether Honolulu Hale retrofit goals and objectives were achieved

Audit statement: Cost savings were achieved three times in FY2002-03, FY2003-04, FY2004-05, and that in FY2006-07, the Honolulu Hale's electricity consumption exceeded the guaranteed maximum usage by 352,856 kilowatt hours and the cost guarantee by \$65,816.

City Response: The DDC provided the City Auditor with the Honolulu Hale Energy Study Report dated December 15, 1999 and the Honolulu Hale Detailed Energy Study Revision 1 – Cogeneration dated October 17, 2000 for review. The City Auditor did not include in the report that one of the major energy conservation measures of the project was the installation of a cogeneration (cogen) system. With the cogen system, the City was able to generate approximately 40% of Honolulu Hale's electricity needs on-site without having to pay HECO.

The cogen system ran on synthetic natural gas (SNG) purchased from The Gas Company. However, in FY2007 the cogen system was shutdown because the cost of generating electricity on-site was more expensive than purchasing the same amount of electricity from HECO. This explains the spike in electricity costs in FY2007. The auditor noted earlier (on page 10, Chapter 1, Scope & Methodology) that the audit focused strictly on electricity provided by HECO. The auditor did not ask questions about the operation of the cogen system or for any bills from The Gas Company.

Audit statement: Without annual reports as required by the contract, the department, and the city, has no way to determine if actual cost and consumption goals were met.

City Response: The DDC administrator monitors the electricity bills to determine if the goals are met. The administrator also monitors the gas bills. By reviewing both sets of bills, the administrator made the determination that discontinuing the cogen system would realize a savings on the City overall utility bills (both electricity and gas). Electricity costs or consumption cannot be viewed in a vacuum and must be looked at holistically with all energy sources. This holistic approach is the focus of the 21st Century Ahupua`a.

Page 30, Chapter 2, Summary of Findings – Lighting retrofit project benefits are assumed, but undeterminable – NBC Exhibition Hall Light Improvements

Audit statement: Rather, this energy efficiency project was implemented based on industry projections and the assumed cost savings it will bring.

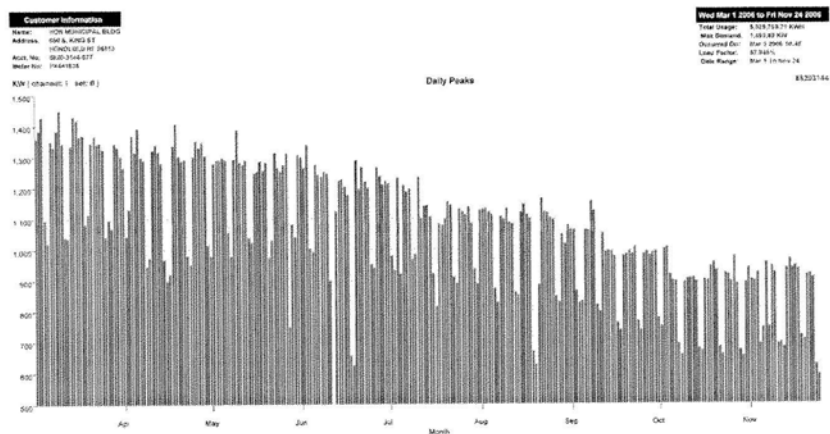
City Response: Using industry projections and engineering practices is a responsible method. The NBC Exhibition Hall Lighting project had three (3) goals: provide better quality lighting to attract more customers; minimize construction cost and effort; and provide more energy efficient lighting. These goals were achieved through sound engineering practices. Several lighting technologies were studied. Computerized lighting calculations were made to evaluate the quantity of lighting. A lighting audit was performed to determine the baseline electricity usage and the projected



electricity usage based on manufacturer's data on an "apples for apples" basis (constant variables). The calculations were documented in the City's energy award application to HECO. HECO awarded the NBC project an Honorable Mention at its 2006 Energy Efficiency Awards program.

Page 30, Chapter 2, Summary of Findings – Electricity monitoring and tracking alternatives are limited and in some instances may undermine cost savings benefits – enhance metering
Audit statement: *HECO offers, at no cost, enhanced monitoring services for qualified facilities where an entity can track usage via the web. While this service is useful for monitoring electricity use in real-time it is not effectively used to provide historical data needed to measure that use against established goals and objectives.*

City Response: The enhanced metering offered by HECO is used by DDC and does provide a valuable tool for the historic tracking of electricity usage. The graph on the right was taken from HECO’s MV-Web enhanced metering website. The graph shows the peak electricity demand for FMB at the start of the energy conservation measures to the completion of the retrofitted chiller plant. The graph shows the decrease in energy demand as the energy conservation measures take affect.



Page 38, Chapter 2, Summary of Findings – 21st Century Ahupua`a electricity consumption goal lacks a plan for achievement

Audit statement: *While we commend the administration and the task force for establishing a defined electricity consumption goal that is measurable over time, we are concerned about the apparent lack of an implementation plan.*

City Response: The implementation plan is described in the Mayor’s 21st Century Ahupua`a Energy and Sustainability plan and is described by the City Auditor on page 9. The plan calls for the City to schedule and implement energy conservation retrofit projects with a simple payback of 20 years or less; agencies are tasked to rank city buildings by energy usage to identify baseline and initial energy savings potential; conduct energy assessment (audits) of high electricity consumption facilities; evaluate cost effectiveness; and implement cost effective projects with capital improvement program funds or other financing. The energy and sustainability plan is an ever evolving document and is periodically updated.

Version 1.1 of the plan was released in April 2008. One of the revisions was in the area of energy conservation. Conducting an energy efficiency workshop for City facilities was added to the plan for reducing electricity consumption. This workshop was held on June 20, 2008 for all City agencies that consumed electricity. The workshop was sponsored by the task force and lead by the energy conservation working group. During the workshop agencies were provided with

their historical billing data and were tasked with identifying and ranking their facilities from highest to lowest electricity usage. The information gathered from this exercise will be used to formulate the FY2005 electricity baseline data. In addition, guest speakers from HECO, an energy services company, a green building practitioner, and a solar energy expert made presentations showing the different ways that City agencies can reduce electricity consumption in their facilities.

The 21st Century Ahupua`a Energy and Sustainability Plan has received national recognition.

Page 45, Chapter 2, Summary of Findings – Conclusion

Audit statement: *Because Honolulu is served by a single electricity provider, there is little the city can do to control the cost of electricity.*

City Response: This statement is true and should have been stated in the opening of the report. The audit should have focused on kilowatt-hours (consumption) instead of expenditures (cost). The cost of electricity parallels the City's electricity bills as graphically illustrated above. If the City Auditor had the resources to focus on the kilowatt hours they would have used FY2002-03 as the baseline for their audit. The results would have shown that the City has grown in the number of new facilities, but more importantly electricity consumption in existing facilities has been reduced (as pointed out earlier).

Appendix 2



The United States Conference of Mayors

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For Immediate Release
Friday, June 20, 2008

Contact: Lina Garcia, USCM
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Daphne Davis Moore, Wal-Mart Stores Inc.
479.204.9044/daphne.moore@wal-mart.com

2008 MAYORS' CLIMATE PROTECTION AWARD WINNERS ANNOUNCED

Seattle (WA), Carmel (IN) Receive Top Honors

Miami, FL — Mayors Greg Nickels of Seattle (WA), and James Brainard of Carmel (IN) have been awarded first place honors in the 2008 Mayors' Climate Protection Awards Program. The second annual awards, sponsored by The U.S. Conference of Mayors and Wal-Mart Stores, Inc., recognize and honor mayors for their outstanding and innovative practices to increase energy efficiency in their cities and to help curb global warming.

An independent panel of judges, selected by The U.S. Conference of Mayors, determined the winning cities from a pool of over 60 applicants based on the following criteria: mayoral leadership, creativity and innovation, and reduction of greenhouse gas emissions and/or improved quality of life in their community.

Outstanding Achievement Awards were received by:

(Large cities) – Denver Mayor John W. Hickenlooper; Honolulu Mayor Mufi Hanneman; Houston Mayor Bill White; and New York Mayor Michael Bloomberg.

(Small cities) – Chapel Hill (NC) Mayor Kevin C. Foy; Columbia (MO) Mayor Darwin Hindman; Highland Park (IL) Mayor Michael Belsky; and Orland Park (IL) Mayor Daniel J. McLaughlin.

"These two leading mayors, Seattle Mayor Greg Nickels and Carmel Mayor James Brainard have proven that despite an economic downturn in cities and our nation, mayors continue to do what's right to protect our climate in America. Their actions serve as outstanding examples for other cities of all sizes," said Conference President Trenton Mayor Douglas H. Palmer. "We also commend all the other winners including outstanding achievement and honorable mentions for all their work and dedication to improve our environment."

-more-

"Our mayors stand at the gateway to the lives and homes of everyday Americans, and Wal-Mart is proud to recognize those that are working to make climate protection a priority," said Eduardo Castro-Wright, president and CEO of Wal-Mart Stores, U.S. "While the challenge of climate change remains, together we are helping Americans reduce their energy use and save money so they can live better. With the commitment of USCM, Wal-Mart and everyday citizens, we will continue to move our cities, our nation and our planet forward toward a more sustainable future."

First Place - Award Winning Program Summaries:

Seattle Mayor Greg Nickels (Large City)

Program Name: *Seattle Climate Action Now*

Seattle Climate Action Now is a grassroots climate protection campaign aimed at giving Seattle residents the tools they need to start making a real difference at home, at work and on the road.

Carmel Mayor James Brainard (Small City)

Program Name: *Roundabouts*

Mayor Jim Brainard made the case for installing roundabouts in Carmel, Indiana by promoting their proven environmental friendliness, safety benefits, cost savings and ability to smooth traffic flow.

Honorable Mention citations were also awarded to the following cities:

Bartlett (IL) Mayor Catherine J. Melchert; Chattanooga, (TN) Mayor Ron Littlefield; Colorado Springs, (CO) Mayor Lionel Rivera; Oakland Mayor Ron Dellums; Phoenix Mayor Phil Gordon; Pleasanton (CA) Mayor Jennifer Hosterman; San Francisco Mayor Gavin Newsom; and Scranton (PA) Mayor Christopher A. Doherty

The Mayors' Climate Protection Awards were jointly presented at the Conference of Mayors' 76th Annual Meeting in Miami, FL by Conference President Trenton Mayor Douglas H. Palmer and Eduardo Castro-Wright, President & CEO of Wal-Mart Stores, U.S.. Wal-Mart Stores Inc.'s support makes the Climate Protection Awards Program possible.

For a full listing of all the winning entries of the 2008 Mayors' Climate Protection Awards, please visit: www.usmayors.org

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Honolulu Mayor Mufi Hannemann

Program Name: The 21st Century Ahupua'a

Program Description: The 21st Century Ahupua'a is the "umbrella" brand for the city's sustainability and climate protection effort. By incorporating the Hawaiian cultural perspective they are able to reach a much larger and more receptive audience for this important message. "Ahupua'a" is the term Hawaiians gave to their sustainable resource management system that enabled them to live in balance with their environment for over 1,800 years. They must benefit from the wisdom of their Polynesian ancestors, combined with the technological innovations of today, to make their island home sustainable and self-sufficient for our future generations. The principals of the 21st Century Ahupua'a include: Honor Their Host Culture, Encourage Green Building & Conservation, Develop Alternative Energy & Bio Fuels, Recycle Solid Waste, Build Efficient Public Transportation, Protect the Forests & Reefs, and Restore Productive Agriculture. The city's 21st Century Ahupua'a has accomplished several major milestones: 1. Establishment of a Multi-departmental task force to set sustainability goals, conduct research and direct pilot projects. 2. Drafted the city's first formal sustainability plan. 3. Establish greenhouse gas inventory processes for city operations. 4. Authored public awareness programs and established private sector and University partnerships to further sustainability and climate protection practices.

Why did the city identify the need for this program? Mayor Hannemann feels that it is important to take a leadership position on the issue of sustainability and climate protection; and to craft the message in a way so as to reach most of their diverse constituents in a way that is appropriate for their unique culture. Mayor Hannemann was also an early signor of the Mayor's Climate Protection Agreement requiring specific goals be met regarding greenhouse gas emissions. Because of Hawaii's unique isolation and vulnerabilities (dependence on imports, especially petroleum), city leaders feel it is imperative that they treat issues of sustainability and self sufficiency with utmost urgency.

What were the challenges faced to implement it? Finding simple concepts and symbols that resonate with their community and communicate the importance and interconnectivity represented by the wide gamut of sustainability issues. In other words, getting people to see the big picture. Also, finding consensus on the priority of various projects and selection of specific technology solutions posed a challenge...one that was largely overcome by open Web access to communications and transparent operations.

How has the program reduced greenhouse gas emissions in the local community? By beginning the process of raising people's awareness of sustainability and establishing a shared vision with universal buy-in. The majority of behaviors encouraged by their sustainability plan contribute greenhouse gas reduction. They have established specific goals for green house gas reductions which have all been dramatically impacted by projects like: 1. Waste to energy operations 2. 28 mile rail transit plan 3. Biodiesel production & fleet conversion 4. Multiple alternative energy co-production & conservation strategies. 5. Green building practices (i.e. all new city facilities to be LEED Silver or better).

How is this program outstanding or innovative? The 21st Century Ahupua'a is a product of Hawaii's cultural history and unique vulnerabilities as an isolated Island community, yet it can serve as a model for the entire planet. Their islands are a living laboratory and a scale model of the issues facing the planet.

How was the program financed? The Mayor's Energy & Sustainability Task Force helps to redirect existing operational and CIP budgets within various departments to "sustainable" projects including: 1. Curbside Recycling pilot projects 2. Mayor's 21st Century Ahupua'a Youth Ambassadors - high school student programs 3. Bio-fuel projects 4. Green Parking program -

priority parking for hybrids 5. Green Roof & catchment projects. 6. Roof top wind generation tests. The task force is also able to secure private sector partners who contribute equipment and services such as: Hoku Scientific's contribution of 15 kilowatt photovoltaic array for our neighborhood sustainability center; and Media partners Clear Channel and Honolulu Advertiser to promote the city's endorsement of Earth Hour 2008.

How has this program improved the quality of life in the local community? By invoking pride in their island culture, they create a unifying theme for the advancement of specific sustainability initiatives. The 21st Century Ahupua'a has continued to gain momentum toward a shared vision and growing enthusiasm for public participation and support for sustainable practices and environmental awareness.

Houston Mayor Mayor Bill White

Program Name: The Comprehensive Renewable Energy Program

Program Description: The Comprehensive Renewable Energy Program gives the City of Houston the contractual ability to bring in up to 80 megawatts, or 700,800,000 kilowatt-hours, of renewable power, which represents 50% of the City's total power. The design of the contract includes a negotiated structure that comprises third party wholesalers, Reliant Energy, the Government Land Office, and City of Houston to transact long-term wind power. The strategy is to purchase wind power in 10-megawatt increments for 5-year terms at competitive prices. Currently the City has purchased 30-megawatts, and was recognized by the EPA as Green Power leader, ranking second in the nation in the amount of renewable energy purchased among municipal governments.

Why did the city identify the need for this program? The city spent approximately \$150 million during the last fiscal year on electricity, paying a rate of roughly \$91 per 1,000-kilowatt hours. Hurricanes Katrina and Rita drove natural gas and power prices up 3 fold, creating liabilities for the City of \$30M over budget. City officials, who have seen Houston's electricity bills nearly double since 2004, hope the new source of energy will help control those costs over the five-year contract.

What were the challenges faced and overcome to implement it? Officials from the City had to work to stabilize the City's \$150 million annual electricity bill. The strategy that City experts choose to implement focused on a diversified power portfolio including the use of renewable wind power. The City had to negotiate a contract that would allow them to purchase large amounts of renewable wind generated power, in a cost effective manner. They were able to do this by creating a complicated structure between Reliant Energy, the Government Land Office, and the City. This made it possible to purchase the energy on the wholesale market.

How has the program reduced greenhouse gas emissions in the community? Since this electricity is coming from a clean / renewable source, once the 50 Megawatt threshold is met, (of which the City is only 20-megawatts away), the City will be reducing the greenhouse gas emissions associated with their electricity usage by approximately 300,000 metric tons per year. That is the equivalent of removing 60,000 cars from the road. Once enacted, Houston will lead the nation in the percentage of renewable energy used by a City government.

How is this program outstanding or innovative? This program is an outstanding example of good government policy. The Mayor's Office was able to negotiate a renewable energy contract that allows the City to purchase the renewable energy on the

Appendix 3

III. ENERGY CONSERVATION

A. Electricity Initiative Team

In 2005, the Electricity Initiative Team (EIT) was formed as a subcommittee of the Energy Issues Committee (EIC). The EIT identified potential short-term and long-term initiatives to address the City's rising electricity costs. The initiatives ranged from a short-term initiative such as an Employees' Awareness Program, whereby workers are made aware of the electrical energy issues and educated on the measures that they can do to longer term measures such as retrofitting high energy consuming equipment. It is important to note that the City has been actively pursuing energy conservation measures prior to the recent increases in fuel oil prices. However, it is acknowledged that more can and needs to be done in order for the City to reduce its electricity consumption.

Appendix A shows the matrix of proposals considered and evaluated by the EIT. Some of the proposals have been incorporated in this plan.

The following outlines the City's past, current and potential future efforts in energy conservation.

B. Energy Efficiency in Public Buildings

1. Completed Energy Savings Projects

- ☒ Honolulu Hale Energy Conservation Improvements - The Honolulu Hale project was completed in 2002. This project involved the replacement of a 1970's era air conditioning chiller plant; the installation of a 200 kW cogeneration system with a 70-ton cooling capacity absorption chiller; the replacement of the existing cooling tower with an induced draft cooling tower; the modification of the chilled water piping system; the installation of a modern energy management and control system; the replacement of T-12 linear fluorescent lamps and magnetic ballasts with T-8 fluorescent lamps and electronic ballasts; the installation of period light fixtures with compact fluorescent lamps in public and exterior spaces; and the replacement of incandescent exit signs with LED exit signs. In year 2000,



3. Future City Actions

Objectives: 1) Reduce electricity consumption in existing City's public buildings by 10% from FY 2007 to FY 2017 as compared to FY 2005 baseline data. 2) Construct new City buildings using Green Building practices. 3) Retrofit City affordable housing projects with energy efficient light fixtures during routine maintenance.

- ☒ **Energy Efficiency in Public Buildings** - Plan and implement energy conservation retrofit projects with a simple payback of 20 years or less.
 - Conduct an energy efficiency workshop for City personnel involved in the budgeting, operations and maintenance of City facilities.
 - Rank public buildings by energy usage to identify baseline and initial energy savings potential.
 - Conduct energy assessments (audits) of high ranking facilities.
 - Evaluate cost effectiveness of the potential energy efficiency solutions.
 - Implement cost effective projects with Capital Improvements Program funds or alternative financing methods.

- ☒ **Design and Construction Green Buildings** - Construct new City buildings using Green Building practices.
 - City Ordinance 06-06 requires that all new City buildings greater than 5,000 square feet shall be LEED Certified Silver starting with FY08 funded design projects.
 - Educate City design and project management personnel on LEED intents and credits, with emphasis on integrated design.

- ☒ **Retrofit City affordable housing projects with energy efficient light fixtures during routine maintenance.**
 - Property managers at various City affordable housing projects will replace burnt out incandescent and obsolete fluorescent lights with energy efficient lights during routine maintenance.

Appendix 4

WESTERN STATES CONTRACTING ALLIANCE

MASTER PRICE AGREEMENT

for

COMPUTER EQUIPMENT, SOFTWARE, PERIPHERALS AND RELATED SERVICES

DELL MARKETING L.P.

Number A63307

This Agreement is made and entered into by Dell Marketing L.P., One Dell Way, Round Rock, TX 78682, ("Contractor") and the Department of Administration ("State") on behalf of the State of Minnesota, participating members of the National Association of State Procurement officials (NASPO), members of the Western States Contracting Alliance (WSCA) and other authorized Participating States and Participating Entities.

RECITALS

WHEREAS, the State has the need to purchase and the Contractor desire to sell; and,

WHEREAS, the State has the authority to offer contracts to CPV members of the State of Minnesota and to other states.

NOW, THEREFORE, in consideration of the mutual promises contained herein, the parties agree as follows:

INTENT AND PURPOSE

The intent and purpose of this Agreement is to establish a contractual relationship with equipment manufacturers to provide, warrant, and offer maintenance services on **ALL** products proposed in their response to the RFP issued by the State of Minnesota. The Contractor may use subcontractors to provide the warranty and/or maintenance services; however the Contractor will be responsible for working with the equipment manufacturer on behalf of the Purchasing Entity and for the timeliness and quality of all services provided. No type of Lease transactions are allowed through this Agreement.

The Agreement is **NOT** for the purchase of major, large hardware or hardware and software offerings. In general, individual units/configurations should not exceed \$50,000 each. It is the expressed intent of some of the Participating States to set this level at not to exceed \$25,000 each. This **IS NOT** a restriction on how many units/configurations can be purchased, but on the value of each individual unit/configuration. Individual Participating States and Participating Entities may set specific limits in a participating addendum, with the prior approval of the WSCA Directors.

Contractors may offer, but participating states and entities do not have to accept, limited professional services related **ONLY** to the equipment and configuration of the equipment purchased through the Agreement.

1. Definitions

"Announced Promotional Price" are prices offered nationally to specific categories of customers (Consumer, Business or government) for defined time periods under predefined terms and conditions.

"Contract" means an agreement for the procurement of items of tangible personal property or services.

"Contract Administrator" means an individual appointed by the State to administer this Agreement on behalf of the State of Minnesota, the participating NASPO and WSCA members, and other authorized purchasers.

16. Technical Support

The Contractor agrees to maintain a toll-free technical support telephone line. The line shall be accessible to Purchasing Entity personnel who wish to obtain competent technical assistance regarding the hardware and software installation or operation of Contractor-supplied Products during the product warranty period or during a support agreement.

17. Take back/Environment/Energy Efficiency Programs

The Contractor agrees to maintain for the term of this Agreement, and all renewals/extensions thereof, programs as described in their response to the RFP, including but not limited to:

- A. Take back/Recycling of CPUs, servers, monitors, flat panel displays, notebook computers, and printers. Costs are listed on the web site.
- B. Environment: Compliance with the European Unions' Directives, or other international directives; reduction/minimization/avoidance of the use of toxic and hazardous constituents; certification by independent third party eco-labeling programs (TCO, Blue Angel, and Nordic Swan); ISO 14001 certification; and the use of recyclable, nontoxic packaging.
- C. Energy Efficiency: Products meet the Energy Star or other recognized programs for energy efficiency.
- D. Product labeling of compliance with Items B & C above, as well as identification of such information on the web site.

The Contractor will notify the Contract Administrator, in writing, of any additions/changes/deletions to the above programs.

18. Product Delivery

Contractor agrees to deliver Products to Purchasing Entities within and estimated 14 - 30 days after receipt of a valid Purchase Order, or in accordance with a schedule agreed to between the Purchasing Entity and the Contractor.

19. Force Majeure

Neither party hereto shall be considered in default in the performance of its obligations hereunder to the extent that performance of any such obligations is prevented or delayed by acts of God, war, strike, riot, industry-wide constraints, or other catastrophes beyond the reasonable control of the party unless the act or occurrence could have been reasonably foreseen and reasonable action could have been taken to prevent the delay or failure to perform. A party defaulting under this provision must provide the other party reasonable written notice of the default and take all necessary steps to bring about performance as soon as practicable.

20. Records and Audit

Per Minn. Stat. § 16C.05, Subd. 5, the books, records, documents, and accounting procedures and practices of the Contractor and its employees, agents, or subcontractors relevant to the Minnesota transactions must be made available and subject to examination by the contracting agency or its agents, the Legislative Auditor and/or the State Auditor for a minimum of six years after the end of the Contract or transaction.

Unless otherwise required by other than Minnesota Purchasing Entity governing law, such records relevant to other Purchasing Entity transactions shall be subject to examination by appropriate government authorities for a period of three years from the date of acceptance of the Purchase Order.

21. Independent Contractor

The Contractor and its agents and employees are independent contractors and are not employees of the State of Minnesota or of any participating entity. The Contractor has no authorization, express or implied to bind the Lead State, NASPO, WSCA or any Participating Entity to any agreements, settlements, liability or understanding with other third parties whatsoever, and agrees not to perform any acts as agent for the Lead State, NASPO, WSCA, or Participating Entity, except as expressly set forth herein. The Contractor and its agents and employees shall not accrue leave, retirement, insurance, bonding, use of state vehicles, or any other benefits afforded to employees of the Lead State or Participating Entity as a result of this Agreement.