

LEGISLATIVE REPORT

Subject: State Budget – Energy Reduction Efforts

Reference: HB 1900, HD1, SD1, CD1, Section 168.5 (Act 160, SLH 2006)

Action Requested: Report on (1) energy consumption for the past two years; (2) steps taken to inventory, investigate, plan, and implement energy reduction efforts; and (3) a plan or alternatives to reduce energy consumption in the future.

DOE Report: According to Carilyn Shon, Energy Conservation Program Manager, Strategic Industries Division, the legislative report for Act 96 and Act 160 from all executive departments will be consolidated by the Department of Business, Economic Development, and Tourism (DBEDT) and submitted to the Legislature. These two reports are part of the matrix DBEDT asked all agencies to complete and submit in September 2006. Attached is a copy of our submittal to DBEDT.

Reporting Requirements
For Each Department/Agency

Department or Agency: Department of Education
Statutory Requirement
Act 96 SLH 2006: Buildings and Facilities
<p>(1) Design and construct buildings meeting the Leadership in Energy and Environmental Design silver or two green globes rating system or another comparable state-approved, nationally recognized, and consensus-based guideline, standard, or system, except when the guideline, standard, or system interferes or conflicts with the use of the building or facility as an emergency shelter; Steps taken to address this requirement: All future designs for new or substantially renovated Department of Education (DOE) buildings will include these requirements where appropriate. Beginning with this fiscal year, all design estimates for new or substantially renovated facilities will include a separate line item cost for project documentation and commissioning requirements to meet LEED Silver or Two Green Globe ratings. Three new schools, Ewa Makai Middle, Lahaina III Elementary and Wailuku Elementary II, are currently in design following LEED Silver requirements. Also, the following new projects for existing schools will seek LEED Silver certification: Naalehu Elementary – six classroom building, Kapaa Elementary – library, and Lanai High and Elementary – six classroom building.</p> <p>The DOE has developed a document called the Hawaii High Performance School Guidelines which provides direction/guidance for our design consultants. This document, developed by Charles Ely through a grant from DBEDT, identifies design methodologies specific to Hawaii which are sustainable and supports both LEED and Two Green Globe ratings. The document is now given to all consultants designing new DOE facilities. The DOE held a workshop for consultants on this document and is planning a follow-up workshop.</p> <p>We plan to develop guidelines and specifications for sustainability in our operations and maintenance procedures and train school-level personnel in their application. We plan to incorporate a review of school-level practices in the annual School Inspection Program beginning with FY 07-08.</p>
<p>(2) Incorporate energy-efficiency measures to prevent heat gain in residential facilities up to three stories in height to provide R-19 or equivalent on roofs, R-11 or equivalent in walls, and high-performance windows to minimize heat gain and, if air conditioned, minimize cool air loss. R-value is the constant time rate resistance to heat flow through a unit area of a body induced by a unit temperature difference between the surfaces. R-values measure the thermal resistance of building envelope components such as roof and walls. The higher the R-value, the greater the resistance to heat flow. Where possible, buildings shall be oriented to maximize natural ventilation and day-lighting without heat gain and to optimize solar for water heating. This provision shall apply to new residential facilities built using any portion of state funds or located on state lands; Steps taken to address this requirement: We will include the roofing R-value requirements in the specifications when we re-roof the Lahainaluna School dormitories and, when they are transferred to the DOE from HCDCH, teacher cottages. In addition, all new DOE facilities are being designed to meet LEED or Two Green Globe ratings which incorporate energy-efficient measures and minimize heat gain or cool air loss.</p>
<p>(3) Install solar water heating systems where it is cost-effective, based on a comparative analysis to determine the cost-benefit of using a conventional water heating system or a solar water heating system. The analysis shall be based on the projected life cycle costs to purchase and operate the water heating system. If the life cycle analysis is positive, the facility shall incorporate solar water heating. If water heating entirely by solar is not cost-effective, the analysis shall evaluate the life cycle, cost-benefit of solar water heating for preheating water. If a multi-story building is centrally air conditioned, heat recovery shall be employed as the primary water heating system. Single family residential clients of the department of Hawaiian home lands and any agency or program that can take advantage of utility rebates shall be exempted from the requirements of this paragraph so they may continue to qualify for utility rebates for solar water heating; Steps taken to address this requirement: When constructing new facilities or when replacing existing water heaters (typically located in school cafeterias and locker rooms), our Facilities Development Branch will perform a comparative analysis to determine the cost-benefit of using a conventional water heating system or a solar water heating system.</p>
<p>(4) Implement water and energy efficiency practices in operations to reduce waste and increase conservation; Steps taken to address this requirement: We are approaching utilities comprehensively – electricity, water, sewage disposal, and gas. Our Auxiliary Services Branch will now pay all utility bills. Previously gas, water, and sewer bills were paid by the Accounting Section, and only electricity was paid by the Auxiliary Services Branch. The Auxiliary Services Branch has the resources to track individual school usage as well as monitor overall department consumption and implement conservation measures. The energy efficiency coordinator will be in charge of this effort.</p>

Our Facilities Maintenance Branch personnel will install low-flow bathroom fixtures as appropriate whenever existing fixtures need replacing. We will advise school-level personnel to install low-flow bathroom fixtures whenever existing fixtures need replacing, if the work will be done by school-level personnel or by a third party at the direction of school-level personnel.

We are replacing the fluorescent light fixtures in all schools with energy efficient ballasts and lamps, and conducting a pilot to outfit classrooms and restrooms with motion detector light switches at Lincoln and Pauoa schools. We are looking into funding these projects using Municipal Leasing rather than conventional CIP bonds since the energy savings from the more energy efficient fixtures can be used to payback the lease loan.

We plan to look at a number of ways to conserve electricity and other utilities at schools. Some of these ideas include:

- Installing timers on school night lights and turning off lights after a certain period (i.e. 11:00 p.m.).
- Instituting a blackout at night for all schools where appropriate.
- Limiting the use of personal appliances in school classrooms and offices.
- Limiting the watering of school grounds to early morning or late evening.
- Encourage the use of networked printers rather than individual printers.
- Encourage shutting off all computers at the end of the workday.
- Encourage shutting off central air-conditioning one half hour prior to the close of business.

- (5) Incorporate principles of waste minimization and pollution prevention, such as reducing, revising, and recycling as a standard operating practice in programs, including programs for waste management in construction and demolition projects and office paper and packaging recycling programs;

Steps taken to address this requirement: In meeting the requirements for LEED Silver or Two Green Globes rating systems, waste minimization, pollution prevention, and recycling by the contractor of construction materials will be included in the construction specifications for all new facilities. We will also incorporate these specs for repair and maintenance (R&M) projects where applicable.

We are studying the feasibility of including separate refuse contracts for school generated green waste and recyclable card board. We have encouraged schools to take advantage of the City Recycling Container program.

We plan to initiate student-led "reduce, reuse, recycle" programs at the school level and monitor them for effectiveness. We plan to develop and implement a "reduce, reuse, recycle" program at the state and complex area offices.

- (6) Use life cycle cost-benefit analysis to purchase energy efficient equipment such as ENERGY STAR products and use utility rebates where available to reduce purchase and installation costs; and

Steps taken to address this requirement: The Office of Business Services, through the Auxiliary Services Branch, will specify Energy Star products in all relevant purchases and will advise school-level personnel of this requirement.

The Procurement and Contracts Branch will assist schools and DOE offices to develop the bid specs to analyze life cycle cost-benefit to purchase energy efficient equipment over \$25,000.

- (7) Procure environmentally preferable products, including recycled and recycled-content, bio-based, and other resource-efficient products and materials.

Steps taken to address this requirement: Our Procurement and Contracts Branch will include environmentally preferable specifications where appropriate.

Act 96 SLH 2006: Transportation Vehicles and Fuel

(1) Comply with Title 10, Code of Federal Regulations, Part 490, Subpart C, "Mandatory State Fleet Program", if applicable;
Assessment / Strategy: The Department of Education will comply with Title 10 "Mandatory State Fleet Program" by dividing the Department by Offices and School Districts, each being counted as a separate agency. (Data below is of 06/06/2006)

- Office of Business Services – 310 vehicles
 - Facilities Maintenance Branch – 129 vehicles
 - Facilities Support Branch – 91 vehicles
 - School Food Services Branch – 69 vehicles
 - Student Transportation Branch – 21 vehicles
- Office of Curriculum, Instruction and Student Support – 121 vehicles
 - Hawaii Center for the Deaf and Blind – 5 vehicles
 - Art – 2 vehicles
 - Teleschool – 1 vehicle
 - Drivers Ed – 113 vehicles
- Office of Information Technology Services – 7 vehicles
 - Network Support Services Branch – 7 vehicles
- Honolulu District – 7 vehicles
- Central District – 5 vehicles
- Leeward District – 4 vehicles
- Windward District – 3 vehicles
- Hawaii District – 43 vehicles
- Maui District – 62 vehicles
- Kauai District – 9 vehicles

Determine if agency is a covered fleet:

- Number of light duty vehicles (gross vehicle weight rating of 8,500 pounds or less).
- Compare against Environmental Protection Agency (EPA) decision tree.
 - Agency owns, operates or controls at least 50 light duty vehicles (LDV).
 - Of 50 light vehicles, 20 or more are primarily used on Island of Oahu.
 - Same 20 LDV are centrally fueled or capable of being centrally fueled.
- If Agency is operating a covered fleet, need to comply with all vehicle purchasing and annual reporting requirements under the Federal EPA regulations.
- If Agency is not a covered fleet, Agency will need to comply with all vehicle purchases and annual reporting State of Hawaii requirements under Act 96/SLH 2006.

(2) Comply with all applicable state laws regarding vehicle purchases;
Assessment / Strategy: State Procurement Office is developing vehicle purchasing guidelines for the State. Once they develop, DOE Procurement will review and adopt.

(3) Once federal and state vehicle purchase mandates have been satisfied, purchase the most fuel-efficient vehicles that meet the needs of their programs; provided that life cycle cost-benefit analysis of vehicle purchases shall include projected fuel costs;
Assessment / Strategy: Our Procurement and Contracts Branch will develop procurement guidelines, use DBEDT-established assumptions about future fuel costs, and purchase vehicles accordingly.

(4) Purchase alternative fuels and ethanol blended gasoline when available;
Assessment / Strategy: For light duty vehicles, only ethanol-blended gasoline is currently available, so no specific further action is required.

(5) Evaluate a purchase preference for biodiesel blends, as applicable to agencies with diesel fuel purchases;
Not applicable. Superseded by Act 240 of 2006, which established a 5¢ gallon preference for biodiesel.

(6) Promote efficient operation of vehicles;
Assessment / We will distribute "how to drive fuel-efficiently" to all employees, whether they drive a Department vehicle or not, and we will monitor the fuel consumption of individual state-owned vehicles to identify low-economy vehicles and counsel the drivers of the vehicles on how to drive fuel-efficiently.

(7) Use the most appropriate minimum octane fuel; provided that vehicles shall use 87-octane fuel unless the owner's manual for the vehicle states otherwise or the engine experiences knocking or pinging;
Assessment / We will determine which vehicles require gasoline with an octane rating higher than 87, attach a label on the dashboard of all gasoline-fueled vehicles of the octane rating to be used in the vehicle, and monitor fuel purchases to confirm that the octane rating conforms to vehicle requirements.

(8) Beginning with fiscal year 2005-2006 as the baseline, collect and maintain, for the life of each vehicle acquired, the following data:
The Department of Education plans to collect this information for all vehicles owned by the Department of Education. This will exclude vehicles purchased by Charter Schools, since Charter Schools do not come under the Department's jurisdiction.

(A) Vehicle acquisition cost;

Assessment / Strategy: We will collect this data for all vehicles beginning with vehicles purchased in FY 2005-06. We do not have the manpower or the means to collect back data since we have over 400 vehicles on the DOE's inventory, which range from over ten years old to new vehicles.

(B) United States Environmental Protection Agency rated fuel economy;

Assessment / Strategy: Once we determine A above, we can obtain this information for all vehicles purchased beginning with FY 2005-06.

(C) Vehicle fuel configuration, such as gasoline, diesel, flex-fuel gasoline/E85, and dedicated propane;

Assessment / Strategy: Once we determine A above, we can obtain this information for all vehicles purchased beginning with FY 2005-06.

(D) Actual in-use vehicle mileage;

Assessment / Strategy: We plan to collect this data directly from the school/offices as soon as we can set up the tracking system and disseminate the procedure to the schools.

(E) Actual in-use vehicle fuel consumption; and

Assessment / Strategy We plan to collect this data directly from the school/offices as soon as we can set up the procedures and disseminate.

(F) Actual in-use annual average vehicle fuel economy;

Assessment / Strategy We plan to collect this data directly from the school/offices as soon as we can set up the procedures and disseminate.

And

(9) Beginning with fiscal year 2005-2006 as the baseline with respect to each agency that operates a fleet of thirty or more vehicles, collect and maintain, in addition to the data in paragraph (8), the following:

(A) Information on the vehicles in the fleet, including vehicle year, make, model, gross vehicle weight rating, and vehicle fuel configuration;

Assessment / Strategy: We are in the process of gathering this data on all vehicles on inventory. This data would be imported into Maximo so that our complete vehicle inventory is there. Maximo would then be used to track mileage, fuel consumption, and other pertinent data. Each "agency" would be responsible for insuring their users are inputting the data

(B) Fleet fuel usage, by fuel;

Assessment / Strategy: We will be able to collect this data once we set up a tracking system and schools/offices begin inputting the information. Maximo would be able to generate the reports needed to fulfill sections B, C, and D, provided users input data.

(C) Fleet mileage; and

Assessment / Strategy: We will be able to collect this data once we set up a tracking system and schools/offices begin inputting the information.

(D) Overall annual average fleet fuel economy and average miles per gallon of gasoline and diesel."

Assessment / Strategy

Our Auxiliary Services Branch will develop procedures and a program that accomplishes this.

Renewable Energy and Resource Development

All affected agencies and programs are directed to review internal policies, rules, and practices regarding permitting requirements affecting renewable energy development. To the extent possible, permitting policies and practices should be streamlined to expedite implementation of renewable energy projects.

It is requested that agencies prepare by January 12, 2007, a report to my office identifying the **specific steps they have taken to expedite** the approval of renewable energy projects.

We will replace existing light fixtures with energy-efficient fluorescent fixtures or compact fluorescent light bulbs in all classroom renovation projects and whenever a light bulb needs to be replaced.

We will develop or identify an existing handout that identifies specific utility-saving actions, for students to take to their families.

We will encourage individual schools to establish a student-led program which monitor utility consumption at the school and publicize the results to the school community.

We will furnish schools with utility-saving ideas.

We will establish a program to reduce utility consumption at the school level that includes (i) specific measures that schools can take to reduce utility consumption, (ii) financial incentives for schools that stay within a predetermined "energy usage" allocation and (iii) financial penalties for schools that exceed their "energy usage". The allocation details will be worked out after we run the pilot program, which began January 2007 and will run through June 2007. A total of 15 schools from the various counties volunteered to participate in the pilot project. We need to determine whether to base the kilowatt allocation on a three year history or a one year history, as well as set up a methodology to take into account all facilities projects which may impact the school's energy consumption.

Act 160

(1) Energy consumption in kilowatt hours for the past two years (July 1, 2004 to June 30, 2006)

FY '05 (kwh consumption):

The actual kwh consumption for FY 2004-05 (July 2004-June 2005) is: **144,176,208 kwh;**

FY '06 (kwh consumption):

1. The actual kwh consumption for FY 2005-06 (July 2005-June 2006) is: **145,947,093 kwh;** and
2. The forecast kwh consumption for FY 2006-07 (July 2006-June 2007) is: **148,666,663 kwh.**

The increase in the kwh consumption is due to:

1. New portables;
2. New facilities (buildings, cafeteria, library);
3. New schools; and
4. New air conditioning loads.

These increases were somewhat offset through the Department's ongoing program to retrofit classrooms with more energy efficient fluorescent light fixtures (conversion of T-12 light fixtures to T-8 fixtures) and HVAC (air conditioning) equipment.

Act 160

(2) Steps taken to inventory, investigate, plan, and implement energy reduction efforts; and

Steps taken: This is what is set forth above. The Legislature via Act 96 has appropriated an Energy Coordinator position to the Department of Education (DOE) to assist with this effort. This position has been established by the Department and is in the process of being filled (as of 02/12/07).

Act 160

(3) A plan or alternatives to reduce energy consumption in the future;

Plan or alternatives to reduce energy consumption in the future: The Legislature, through Act 96/SLH 2006, appropriated \$5 million to the DOE for a pilot photovoltaic project. The specific objectives as set forth in the Act as they relate to this Photovoltaic pilot (PV) project include:

1. To have, at minimum, a project site at one of the public schools within each of the counties of Oahu, Hawaii, Kauai and Maui.
2. Installation of PV system to be timed in conjunction with substantial roof repairs or roof replacement.
3. To use the application of net energy metering to offset the cost of the system.
4. To recapture system cost within three quarters of the useful life of the PV system.
5. When advantageous, to use energy-savings contract such as third party lease or purchase to maximize the objectives of this section.
6. Report results and recommendations from this project.

The Governor has released the funds for this project and we have selected Energy Industries as the consultant to implement this program. Energy Industries (EI) is a Hawaii-based Energy Services Company (ESCO) that specializes in reducing the energy expenses of its clients by identifying and implementing energy conservation measures (ECMs) that reduce electrical demand load. EI also specializes in the integration of renewable and distributed energy systems along with energy conservation measures. The contract with EI includes the following deliverables:

1. Rating and selection of project sites (schools) based on a weighted scorecard.
2. Development of basis of design and determine optimal implementation.
3. Project management and quality assurance during construction.
4. Measurement, verification, and reporting of pilot results one year after PV installation.

We are also in the process of developing guidelines, standards, and best practices to meet new energy efficiency requirements for all CIP and R&M projects.