OHIO DEPARTMENT OF PUBLIC SAFETY
EDUCATION • SERVICE • PROTECTION

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REPORT
GOVERNOR'S ORDER 2007-02S

BLUEPRINT FOR ENERGY EFFICIENCY

In response to Governor Ted Strickland's *Executive Order 2007-02S*, the Energy Efficiency Work Group (EEWG) within the Ohio Department of Public Safety (ODPS) was formed. While ODPS's eight divisions have made great strides in energy efficiency, it is apparent the past is no longer an acceptable measure of our future energy needs and uses. More specifically, with the number of mission critical vehicles and facilities within the Ohio State Highway Patrol Division, a significant number of energy resources are required and utilized daily. Therefore, in close coordination with the department, the EEWG conducted a year-long examination of past, present, and future energy needs and uses.

The EEWG operated independently from all other ODPS components with an eye toward critical review and both realistic and innovative recommendations for the near future, as well as both 10-year and 20-year outlooks. The *Executive Order* directs departments to:

- measure and track energy consumption in state buildings,
- calculate each organization's carbon footprint, then
- reduce building energy consumption 5% in Fiscal Year 08, and
- 15% within four years.

This report is a result of collaboration and innovation and will accomplish the worthy goals set forth by Governor Strickland's *Executive Order 2007-02S*.

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EXECUTIVE SUMMARY

As an energy consumer, the Department of Public Safety has a tremendous opportunity to lead by example with energy-smart management. It is with efforts to promote energy efficiency, energy conservation, and the use of renewable energy resources at department facilities, we can save energy, taxpayer dollars, reduce out carbon footprint and demonstrate leadership by selecting cleaner energy choices through the following practices:

GENERAL PRACTICE

- Incorporate energy efficiency in Capital Budget Requests.
- Green pricing option: American Electric Power, (AEP) Ohio is offering us the opportunity to encourage the generation of renewable energy through the purchase of Renewable Energy Certificates. (RECs)
- Work with Ohio Department of Administrative Services (DAS) and ODPS Purchasing/Procurement to implement an environmentally-friendly purchasing policy, i.e., buy only products which are durable, reusable, recyclable, made of recycled materials, non-hazardous, energy efficient, sustainably harvested, produced in an environmentally sound manner.
- Work with the Ohio Rehabilitation Services Commission (RSC), to ensure that the vending machines that they are placing in our facilities have the newest energy saving technologies installed which includes machines that are energy star compliant or machines that have vending misers which hibernate unused machines.
- ODPS Administration may examine the janitorial services provides at the Shipley complex so a balance of the janitorial duties can be performed during business hours and immediately at the close of business thus reducing the time they need to have lights on throughout the building. Lighting represents almost one third of the Administration Division's energy consumption and is one of the easiest to manage.
- Work with DAS and ODPS Procurement/Purchasing to create purchasing standards that require a particular energy efficiency (e.g. EPA Energy Star) rating for all office equipment.
- Use only 100% post-consumer recycled, non-chlorine bleached paper.

FACILITIES

- Develop and phase in *LEED Standards* for building design, construction, performance, maintenance and land use that is consistent with LEED and energy star standards.
- Incorporate energy efficiency line item requests in future Capital Budget Requests.
- Facility Management and ODPS senior staff should choose to explore an in-depth plan to identify the long-range capital plan needed to achieve climate neutrality for achievement of a LEED-silver certification as a minimum.
- Design buildings that generate a known percentage of their own energy on site and re-sell unused generation back to the power companies where the facility is located.

VEHICLES

- Reduce vehicle fleet emissions by utilizing E-85 fuel.
- By the end of calendar year 2009, reduce annual fuel use by 5% (from 3,233,323 gallons to 3,071,657), a savings of 161,666 gallons of fuel.
- Percentage of diesel vehicles capable of using biodiesel to increase to 95% and increase total biodiesel fuel usage to 25% by 2008.
- Obtain an enforcement fleet of flex fuel vehicles by 2011 in order to maximize the use of E-85 as an alternate fuel.
- By 2028, have a 100% clean and green fleet (Clean, green vehicles are vehicles that are either alternative fueled vehicles or vehicles that have EPA fuel efficiency ratings of 45 mpg or greater).

New Paradigm

At the conclusion of this examination or energy usage a promising paradigm developed.

While all the above conservation, efficiency, and green initiatives are critical to long-term success, so to is the premise that many energy efficiency measures are difficult to implement given the constraints of emergency and public service performed 24/7 by Ohio State Highway Patrol troopers and ODPS staff. Even though additional efficiencies and conservation steps can be taken, certain divisions within ODPS have response requirements to emergencies using motor vehicles which consume fuel and which have facilities that must remain open and operational 24 hours a day, 365 days per year.

Previous efforts to conserve motor vehicle fuel within ODPS and the Highway Patrol have centered on increased efficiency as measured by miles per gallon. In the 1970's for example, Patrol cars were required to be parked stationary with the engine off for specified periods of time during a Trooper's shift. This improved mile per gallon efficiency of Patrol car operation but reduced the area of safety that one patrolling trooper can provide. Along with the reduction of patrol area by limiting vehicle usage, the MARCS radios and in-car MCT's require constant power and make that option impractical. Individually, families and businesses across our state make a different changes to lifestyle and business practice which typically result in increased prices or reduced travel when fuel costs soar. ODPS divisions can not implicitly use a reduction in service to provide an increase in energy savings because as a public safety department with legal expectations, could make us derelict in our duty to respond. With that being said, we can use other creative and alternative methods for energy savings.

The EEWG proposes the Ohio State Highway patrol, with its fleet of 1,625 vehicles, along with the other ODPS Divisions, begin July 1, 2008 (the beginning of fiscal year 2009), add as motor vehicle fuel consumption (monthly, quarterly, and annually) the equal measure in fleet management. This action and a targeted five percent reduction in fuel consumption for the Patrol fleet will save 166,000 gallons of fuel per year. At the 2007 average price per gallon, this adds to nearly $500,000 in savings.

Commanders will balance operational line assignments, public service, criminal patrol, and most importantly, fatality reduction efforts with fuel consumption reduction. For example, the fuel consumption rate at idle is 64 percent less than the fuel consumption rate at normal highway speeds. Therefore, the EEWG recommends:

- Fuel consumption be measured, benchmarked, reported at the post and district level allowing for both innovation and commander flexibility toward achieving overall goals.
- Annual inspection efforts include evaluations of Post and District efforts toward compliance while also weighting operational objectives associated with the 24/7 Initiative.
- All ODPS divisions adopt similar measurement and evaluation efforts for fuel consumption, in addition to fuel conservation.

Five percent of the world's population can be found in the United States; however we consume roughly 30 percent of the total energy used. Historically, the United States has imported most of its energy resources from other countries, mainly the Middle East for oil. It has been stated that this puts us in a highly vulnerable position in our national security, political and economic venues. It is imperative that we again lead by example.

Introduction

One cannot turn on the radio, T.V. or pick up a newspaper or magazine these days and not see that two of the hottest topics are "Energy Conservation" and "Global Warming." The coverage has been broad, sometimes balanced, sometimes misrepresented, but often sensationalized. There seem to be experts on both sides of this issue touting their theories with some voice of authority, often leaving the viewer or reader somewhat perplexed.

What is apparent is global warming is the monster of all issues not only facing the energy industry, but also our future. It will be a significant force in the socioeconomic futures of business, cities, states and nations.

When we hear about global warming and energy conservation the terms like climate change, greenhouse gases, renewable energy being tossed around. What does this terminology mean? What direct impact does this have on us as an organization from a political, economic, social and environmental standpoint? Below we will take a look at these questions and hopefully determine a direction on where we will go as a department and leader in this movement.

Purpose

The purpose of the ODPS Energy Plan is to outline a course of action that will provide the Department a means for reducing energy consumption and greenhouse gas emissions. The plan has been developed in accordance with Governor Ted Strickland's Executive Order 2007-02S, and HB 251 (see Appendix A and B) that set out energy policy statements and objectives. It was the desire of the ODPS then to develop a ten and twenty year energy plan in response to the Executive Order and HB 251.

The plan was developed using information gathered by the Energy Efficiency Work Group (EEWG). The plan is a product of information gathered from professionals in the field, publications, universities, internet, and employee interviews from around the state.

The plan was broken up into three major sections: energy, facilities and fleet/vehicles. Each of these sections was broken down into goals, background trends, current programs and accomplishments, action steps, challenges and social impacts. The introduction also includes a review of the history and some terminology associated with energy and sustainability programs.

BACKGROUND

Political, economic, social and environmental stand point The history of federal energy tax policy can be divided into four eras:

- the oil and gas period from 1916 to 1970,
- the energy crisis period of the 1970s,
- the free-market era of the Reagan Administration,
- the post-Reagan era. The Oil and Gas Federal Energy Tax Policy focused on increasing domestic oil and gas reserves and production; there were no tax incentives for energy conservation or for alternative fuels.

Tax Policy during the 1970s

Three developments during the 1970s caused a dramatic shift in the focus of federal energy tax policy. First, the large revenue losses associated with the oil and gas tax preferences became increasingly hard to justify in the face of increasing federal budget deficits.

Second, heightened awareness of environmental pollution and concern for environmental degradation, and the increased importance of distributional issues in policy formulation (i.e., equity and fairness), lost the domestic oil and gas industry much political support. Thus, it became more difficult to justify percentage depletion and other subsidies, largely claimed by wealthy individuals and big vertically integrated oil companies.

More importantly, during the 1970s there were two energy crises: the oil embargo of 1973 — also known as the first oil shock — and the Iranian Revolution in 1978-1979, which focused policy makers' attention on the problems (alleged "failures") in the energy markets and how these problems reverberated throughout the economy, causing stagflation, shortages, productivity problems, rising import dependence, and other economic and social problems.

These developments caused federal energy tax policy to shift from oil and gas supply toward energy conservation (reduced energy demand) and alternative energy sources .

Tax policy in the 1980s

The Reagan Administration opposed using the tax law to promote oil and gas development, energy conservation, or the supply of alternative fuels. The idea was to have a more neutral and less distorted energy tax policy, which economic theory predicts would make energy markets work more efficiently and generate benefits to the general economy. The Reagan Administration believed that the responsibility for commercializing conservation and alternative energy technologies rested with the private sector and that high oil prices — real oil prices (corrected for inflation) were at historically high levels in 1981 and 1982 — would be ample encouragement for the development of alternative energy resources. High oil prices in themselves create conservation incentives and stimulate oil and gas production.

Tax Policy after 1988

The post-Reagan energy tax policy returned more to the interventionist course established during the 1970s and primarily was directed at energy conservation and alternative fuels, mostly for the purpose of reducing oil import dependence and enhancing energy security. However, there is an environmental twist to energy tax policy during this period, particularly in the Clinton years. *Reference #2*

Recent History

National and International efforts towards Reducing Energy Consumption and reducing Green house Gases. Several negative energy market developments since about 1998, characterized by some as an "energy crisis," have led to congressional action on comprehensive energy proposals, which included numerous energy tax incentives.

The United States is also getting pressure from other countries to become more energy efficient and cut down its carbon footprint. What followed is the Kyoto Protocol. The Kyoto Protocol is an international agreement, negotiated in December 1997, by which industrialized nations have committed to making substantial reductions in their emissions of greenhouse gases by 2012. More than 160 countries have committed to the agreement thus far.

The current administration has rejected the Kyoto Protocol as being too costly for the U.S. economy, and has proposed its own climate change initiative, which calls for voluntary reductions in emissions, tax credits for emissions reductions, and increased research and development for new energy technologies. Many individual states - primarily in the northeast and the west - have also begun to adopt their own climate change policies. *Reference #3*

Most recently, on December 14, 2007, Congress passed a new energy legislation package with emphasis on energy efficiency, which was driven, by high energy prices and growing concerns about global warming.

LEGISLATIVE STRIDES

Major efficiency specifications in this new legislation:

Corporate Average Fuel Economy Standards (CAFE)

The legislation calls for a 35 mpg CAFE standard for cars and light trucks by 2020, with "maximum feasible" increases beyond this date. The provision also sets in motion the first fuel economy standards for heavy-duty trucks. The final bill also gradually phases out extra fuel economy credits for dual fuel vehicles, with the credits ending in 2020.

Appliance and Equipment Efficiency Standards

The new law contains many provisions setting new minimum efficiency on such things as appliances dishwashers and dehumidifiers, residential boilers, electric motors, incandescent reflector lamps, external power supplies, metal halide lamp fixtures, walk-in coolers and freezers.

Lamp Efficiency Standards

The bill sets lamp efficiency standards for common light bulbs, requiring them to use about 20-30% less energy than present incandescent bulbs by 2012-2014 (phasing in over several years) and requiring a DOE rulemaking to set standards that will reduce energy use to no more than about 65% of current lamp use by 2020. The initial targets can be met by advanced incandescent lamps the major manufacturers are just introducing to the market using halogen capsules with infrared reflective coatings. The longer-term targets will likely be met by compact fluorescent lamps and other advanced technologies such as light-emitting diodes (LEDs) and very advanced incandescent lamps now in development

Industrial Efficiency Programs

The bill updates the authorization for DOE's industrial program to reflect challenges facing U.S. manufacturing. In particular, the bill addresses the need to develop new manufacturing processes and the ability to make use of alternative feed stocks in response to the increasing cost and scarcity of energy resources.

Combined Heat and Power, Recycled Energy and District Energy

The bill contains important new provisions that promote combined heat and power (CHP), recycled energy and district energy systems.

Commercial Building Initiative

Provision authorizes a Commercial Building Initiative (CBI) combining research, development, and deployment, to be run by DOE with input from an industry consortium. The goal of the initiative is for all new commercial buildings to use zero energy on net by 2030 (i.e. they produce as much energy as they use) and all existing buildings to meet the same goal by 2050. *Reference #4*

State Level: Ohio Efforts towards Reducing Energy Consumption

Shortly after taking office, Governor Ted Strickland issued his second *Executive Order*, "Coordinating Ohio Energy Policy and State Energy Utilization". As evidenced by the lofty goals set forth in this *Executive Order*, he understands the important role that energy commands, not only in Ohio, but also in a global market economy. The *Executive Order* directs departments to measure and track energy consumption in state buildings and calculate each organization's carbon footprint, then reduce building energy consumption 5% in Fiscal Year 08 and 15% within four years. It also requires that State Agencies reduce their dependence on foreign oil, through the use of alternative fueled vehicles, including hybrid electric.

ENERGY

Our energy resources keep the wheels turning on our fleet and the lights on in the building. Five percent of the world's population can be found in the United States, however we consume roughly 30 percent of the total energy used. Historically, the United States has imported most of its energy resources from other countries, mainly the Middle East for oil. It has been stated that this puts us in a highly vulnerable position in our national security, political and economic venues.

During 2007, we observed fossil fuel prices reach record highs in the United States, which help spur new energy bills as discussed above. At the state level, we have Governor Strickland's *Executive Order 2007-02S* that created the role of Governor's *Energy Advisor*. The *Executive Order* directs Departments to measure and track energy consumption in state buildings and calculate each organization's carbon footprint. Upon completion, there is a requirement for a 5% reduction in building energy use within the first year of the biennium FY08 and 15% by the end of the fiscal year 2011. The Governor wants agencies to lead by example in reducing energy consumption, environmental concerns, and energy security risks by improving energy efficiency and adopting advanced energy technology. The 127th General Assembly passed Senate Bill 221 on 10-31-2007, which among other things requires an electric distribution utility by the end of 2025 to supply a portion of its standard service offer supply from advanced energy, in the amount of 25% of the number of kilowatt-hours it supplies in certified distribution territory, and subject to other requirements, including the use of sustainable resources.

Energy conservation programs and initiatives have netted impressive savings for some large supermarket chains, colleges, universities and K-12 schools. Several states have instituted energy conservation measures, limited green house emissions, and instituted green build requirements that are also producing positive results in reducing carbon emissions, energy savings and reduced energy load.

With the number of owned and leased facilities the ODPS occupies, it could be considered a small campus that is spread across the state. The University of Buffalo Campus through its energy conservation program estimates it saves in excess of $9 million annually and has prevented 63.4 million pounds of emissions of carbon dioxide from being released into the atmosphere. By incorporating energy conservation and sustainability practices, ODPS should also see a reduction in energy consumption and expenses.

State Police and Highway Patrol agencies were contacted and found to have no written policy on energy, energy conservation, green building or green fleets. Those that responded seem to be exempt in many areas; however, we are in a position to take a leadership role in this area and demonstrate that we can also conserve energy, reduce greenhouse emissions, have green fleets, and green buildings while not reducing our service to the citizens or the comfort and safety of our employees. It should be noted that many states, have already passed legislation or have had their Governor's issue executive orders mandating that agencies reduce energy consumption and green their fleets.

To obtain a better understanding of the level of awareness that the Department of Public Safety employees had about energy conservation, carbon footprints, current or ongoing energy saving programs, a qualitative questionnaire was developed and interviews were conducted around the state. A cross section of employees were interviewed so as to obtain an accurate picture of where we were prior to an awareness campaign. As expected, there were varying degrees of knowledge about the importance of energy conservation programs, the Governor's *Executive Order*, etc. A small proportion of respondents was not aware of any programs or the Executive Order and believed that it was not important overall.

On the other hand, a small proportion was aware of the items discussed and believed energy conservation programs, recycling, and the *Executive Order* were extremely important. The majority were somewhat aware, thought it was important but did not routinely practice energy conservation, or follow what was going on with global warming and the energy issues. The vast majority did not see or review their energy bills and had no idea how much the ODPS uses or spends on utilities. It was ironic though that several respondents believed it was proper to monitor energy use, since we were using taxpayer money to pay for the services. The last year, for which data was available FY 2007, ODPS spent $878,716.00 on Gas (heat), $1,876, 189.18 on electric, ($27,332.47 on propane) and $235,328.40 on water. An additional $6,699,597.98 was spent on fuel for vehicles.

Why conserve energy?

State agencies have been mandated to reduce their energy consumption in State Owned and Leased Buildings, and reduce their dependence on foreign oil through Governor Strickland's *Executive Order 2007-02S*.

Secondly, energy production, which is driven by energy consumption, from most current sources damages the environment in several ways. ODPS can reduce its impact by using less energy. Energy conservation saves money and helps mitigate global warming, water and air pollution, land destruction and our dependence on foreign oil.

In FY 2007, the last year for which data was available, ODPS spent:

$878,716.00 for gas (heat),

$1,876, 189.18 for electric,

$27,332.47 for propane,

$235,328.40 for water, and

$6,699,597.98 for vehicle fuel.

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PARTICIPANTS

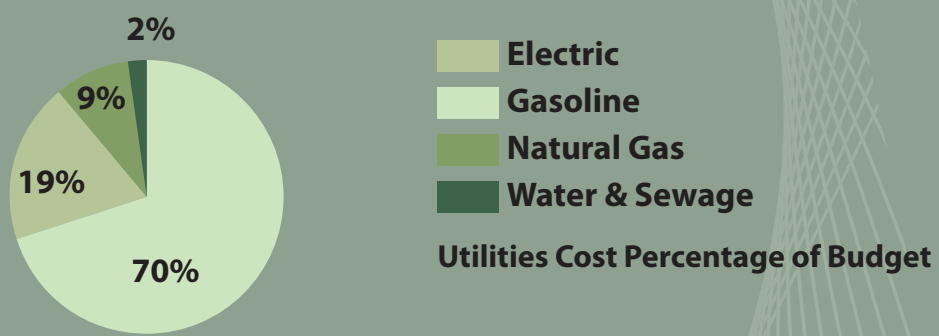
Ohio Department of Public Safety's policy is to conserve energy, improve energy efficiency, reduce cost, optimize capital investment for energy efficiency, reduce environmental and greenhouse gas emissions, and conserve natural resources.

ODPS's immediate intention is to first understand our energy use by the department's divisions, then gain control over our consumption by reviewing, then making recommendations to improve our operating practices and purchases.

This will help us reach the goal of the Governor's *Executive Order* to measure and track energy consumption in state buildings and calculate the carbon footprint, then reduce building energy consumption 5% in Fiscal Year 08 and 15% within four years.

Long term goals of ODPS will be to use fuels efficiently, purchase energy as economically as possible, reduce our carbon foot print, mostly greenhouse gas emissions. Employ renewable energy strategies to reduce our dependence on fossil and foreign fuels.

Utility	Fiscal Year 2007	Fiscal Year 2008 5% Savings	Fiscal Year 2012 15% Savings
Electricity	$1,876,000	$1,782,000	$1,595,000
Gasoline	$6,700,000	$6,365,000	$5,695,000
Natural Gas	$878,000	$835,000	$747,000
Water & Sewer	$235,000	$224,000	$200,000
TOTAL COST	**$9,689,000**	**$9,206,000**	**$8,237,000**



Utilities Cost Percentage of Budget

Fiscal Year 2007 Budget	Fiscal Year 2008 Budget [5% Savings]	Fiscal Year 2012 Budget [15% Savings]
$6,792,330,000	$6,452,710,000	$5,773,480,000

All figures rounded up to nearest thousand.

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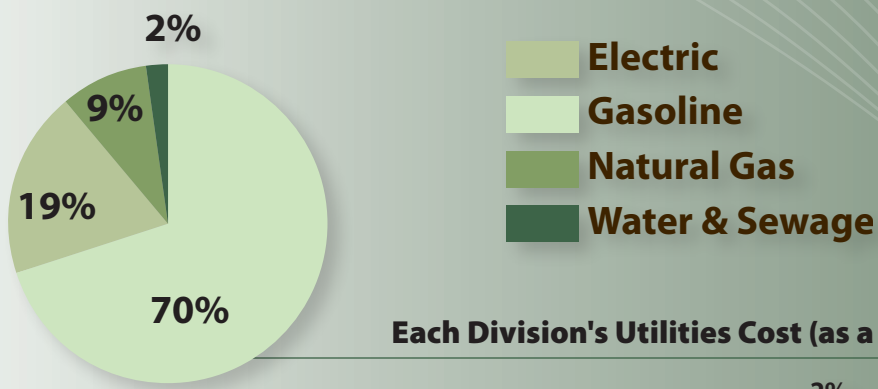
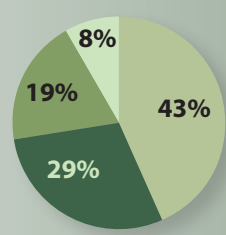
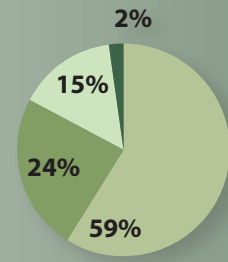
Department's Utilities Cost (Percentage of FY2007 Budget $6,792,330,000)



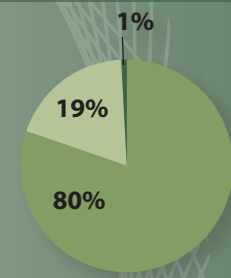
Each Division's Utilities Cost (as a percentage of division's budget)



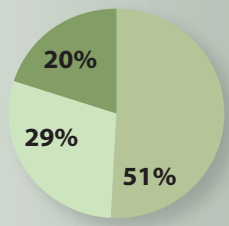
ADMINISTRATION



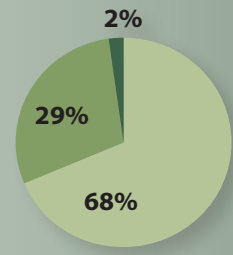
BUREAU OF MOTOR VEHICLES



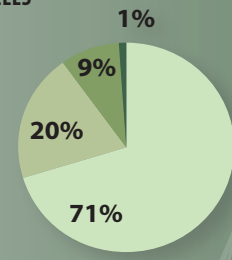
CRIMINAL JUSTICE SERVICES



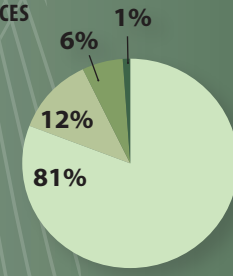
EMERGENCY MANAGEMENT AGENCY



EMERGENCY MEDICAL SERVICES



OHIO INVESTIGATIVE UNIT



OHIO STATE HIGHWAY PATROL

The Homeland Security Division, currently funded by the Ohio State Highway Patrol Division (OSHP), is included in OSHP's data.

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CURRENT PROGRAMS AND ACCOMPLISHMENTS

Ohio Department of Public Safety's policy is to conserve energy, improve energy efficiency, reduce cost, optimize capital investment for energy efficiency, reduce environmental and greenhouse gas emissions, and conserve natural resources.

- The Ohio Department of Administrative Services (DAS) has adopted Portfolio Manager, developed by the U.S. Environmental Protection Agency (EPA), as an on-line tool to be used by agencies to measure and track energy consumption in their buildings, as well as a means of calculating its carbon footprint. (Requirement of EO 2007-02S)
- The Portfolio Manager has been populated with facilities owned by the ODPS. Energy bills from July 2005 to the present time have been entered. OSHP district secretaries, administration and EMA employees, who have been trained, are responsible for updating the Portfolio Manager on a monthly basis from this point forward. This tool will provide facility managers, employees, etc, the ability to monitor energy use and the ability to track if the energy efficient measures they are putting in place are working.
- An energy policy has been created titled Energy Conservation and Audit DPS- 301.08. This policy contains policy for temperature setting for summer and winter. An energy audit, which is required semi-annually, is attached, along with suggestions on ways to save energy. These items can be found in the appendix.
- In conjunction with DAS Office of Procurement Services, and with the assistance of Administrative Assistant Skye Rollings, ODPS enrolled facilities in the natural gas program. A substantial reduction in natural gas cost will be realized due to the enrollment. This is not an energy conservation effort. Adherence to HVAC policies will be necessary to reduce consumption.
- An awareness campaign, which will include posters, stickers and suggestions on how to conserve energy, has been developed to emphasize energy saving practices and fuel saving driving tips to be used in our facilities.
- An awareness presentation for all ODPS Departments, all District Headquarters staffs, and Post Commanders, some DX personnel and facility personnel were made aware on the importance of the program, and how to save and conserve energy. Additionally, stickers for computer monitors and light switches reminding people to turn them off have been distributed as a reminder of the energy conservation campaign.
- ODPS distributed an energy audit, (for owned buildings), to be completed by October 31, 2007, and submit a copy to the energy efficiency work group. This audit, which has been completed, will be used by facility management and those responsible for their facility, a periodic examination of their energy system to ensure energy is being used as efficient as possible in department buildings and to mitigate energy losses as funding becomes available. (This audit can be used in leased facilities also and can be shared with the property owner)

ODPS is currently working with the field to implement energy saving opportunities identified in the audit. Most of the opportunities are being implemented with little or no cost implication.

These improvements will increase energy efficiency immediately and provide ODPS a short rate of return on the investment.

By identifying and minimizing wasted energy through energy audits, ODPS will achieve the following results:

- Conserve non-renewable energy resources which are gradually being exhausted;
- Protect the environment by burning less fossil fuels, e.g. by reducing power generating requirements, thus lessening carbon dioxide emissions which contribute to global warming; and
- Save energy and money by reducing operating costs.

Members of the Department of Public Safety participated in a focus group to assist in a branding effort for the state energy efficiency campaign. Provided input helped solidify the campaign slogan.

The OSHP Technology Communications Services section participated in Web based training from Energy Star that allows networked computers to be managed from a central location to utilize their power saver features. Pennsylvania was able to realize a 10 percent reduction in electrical use by managing their plug loads.

CURRENT PROGRAMS AND ACCOMPLISHMENTS

Action Steps

By promoting energy efficiency, energy conservation, and the use of renewable energy resources at department facilities, we can save energy, taxpayer dollars, and demonstrate leadership with responsible, cleaner energy choices, through the following practices:

- Incorporate energy efficiency line item request in Capital Budget Requests.
- Green pricing option- American Electric Power, (AEP) Ohio is offering us the opportunity to encourage the generation of renewable energy, through the purchase of Renewable Energy Certificates. (RECs)
- Work with DAS and ODPS Procurement/ Purchasing to create purchasing standards that require energy efficiency (e.g. EPA Energy Star) as a mandate for all office equipment.
- Use only 100% post-consumer recycled, non-chlorine bleached paper.
- Work with DAS/ ODPS Purchasing/Procurement to implement an environmentally-friendly purchasing policy, i.e., buy only products which are durable, reusable, recyclable, made of recycled materials, non-hazardous, energy efficient, sustainably harvested, and produced in an environmentally sound manner.
- Work with the Ohio Rehabilitation Services Commission (RSC), to ensure that the vending machines that are installed in our facilities contain the newest energy saving technologies i.e. machines energy star compliant. Can they install vending misers? Below is an excellent example how a small investment such as vending misers can save the department money.

Vending Miser

The table shows how much Tuft's University saves on each vending machine using a vending miser while reducing its CO_2 emissions:

Vending machine Electricity Usage	***Without*** Vending Misor	***With*** Vending Miser
Annual electricity usage*	3468 kWh	1716 kWh
Annual CO_2 emissions@ 1.3 lbs/kWh	2.26 tons	1.12 tons
Vending Miser Cost	0	$165
Annual Cost @ $0.11/kWh	$381	$189
Installation Cost	0	
PAYBACK (not including installation cost)		***Less than 1 year***

*estimate based on a vending machine's one week energy consumption measurement.

- Work with the janitorial service provider to achieve a balance where the bulk of janitorial duties are performed during business hours and immediately at the close of business thus reducing the time they need to have lights on throughout the building at night. Lighting represents almost one third of our energy consumption and is one of the easiest to manage. Heating and cooling temperatures could also be set back at an earlier time.

Further Planning and Research Needs

Continue to educate staff and administration. It was determined through the qualitative interviews that there was a lack of knowledge among ODPS staff about the importance of energy conservation, even with the *Executive Order* and the amount of media attention and educational efforts put forth to date. This education would raise the level of awareness and understanding about how individual actions can have on department wide energy use and associated impacts.

REC's are great way for the ODPS to support renewable energy where generating energy from renewable sources is not an option. REC's cost slightly more, however this is an opportunity to promote green energy and still be cognizant of budget restraints.

In addition to the obvious environmental benefits, green power could have major economic advantages as well:

- It decreases our dependence on foreign oil and the resulting price fluctuations.
- It reduces the need for costly emissions controls.
- It provides new energy markets and creates new jobs. *Reference #5*

Challenges

The electric industry is definitely in new territory and ever changing as it grapples with a variety of different forces including federal and state legislation and pressure from concerned citizens and environmental groups. As electric utilities become deregulated, much like the phone and gas industry before it, it will face increased competition from other power producers, which has shown to drive up the cost in other states. One of the changes that electric companies in Ohio face under HB 221 is that they will be required by the end of 2025 to supply a portion of its Standard Service Offer from advanced energy in the amount of 25% of the number of kilowatt-hours it supplies in its certified distribution territory.

One must remember that even if electric rates drop, this often encourages more energy use while not changing the fact that wasteful energy consumption still degrades the environment through greenhouse gas emissions. Energy consumption drives up energy costs. Higher energy use will result in inflated energy costs- therefore a loss in financial gain from lower rates. The key for all will be continuous efforts in energy conservation and efficiency.

Commitments to energy conservation and reduction in OSHP and ODPS greenhouse emissions can at first be more costly to implement in the beginning, in order to see a greater savings in the operating budget in future years and lessen our impact on the environment. Often these are difficult challenges during tough economic times.

Social Impacts

Energy conservation reduces environmental and social costs as well as saving money. Energy conservation helps alleviate multiple adverse environmental and social impacts that are connected to energy production and use. Using sound energy conservation techniques helps reduce air pollution, global warming, loss of wildlife areas, and construction of new power plants, (which drives up energy costs making it more difficult for low-income populations).

OHIO DEPARTMENT OF PUBLIC SAFETY
EDUCATION · SERVICE · PROTECTION

FACILITIES

The ODPS will develop building standards for construction, major remodeling, and lease build-outs that meet or exceed those developed by the U.S. Green Building Council.

We will meet a portion of our goals on energy efficiency and renewable resources in the design construction process.

The immediate intention is that all of the Ohio Department of Public Safety's new buildings and major remodeling must meet Leadership in Energy and Environmental Design (LEED) Gold standard, and as a minimum meet LEED Silver standards.

ODPS will implement energy conservation measures in our current facilities. OSP/ODPS staff will need to work on fulfilling the *Building Operator Certification Program* or equivalent by April 2009 as required by H. B. 251. It is recommended that each of DPS's large facilities, Shipley, Academy, EMA, and Alum Creek employ a *Certified Building Operator*. The bill allows a designated building operator to manage facilities in a region or district, or manage multiple facilities from a centralized location. Facilities Management along with OSP/ODPS staff will need to establish regions or districts throughout the state and establish an adequate number of *Certified Building Operators* to manage those facilities.

Sustainable design and construction is more than a passing trend. It will be the future. Buildings of the future will not only have to meet Federal, State and local building and energy codes, but carbon codes as well. What this means is that as we build or remodel we will have to account for the carbon emissions during construction and the operation of the facility.

Short term goals (3-5 yrs)

ODPS will reach the goals set out in Governor's *Executive Order 2007- 02S* by modifying and practicing energy efficiency. In the near future on new construction projects a portion of our energy consumption should come from renewable sources and at least 10 percent energy consumption come from on-site during new construction projects. Develop and put in place a procedure to re-commission our older buildings as the budget allows.

Long term plan (10-20 years)

ODPS will strive to have two facilities that use zero energy on net through either new construction or remodeling. (i.e. they produce as much energy as they use). This would help us reach the goal of the Commercial Building Initiative and further enhance the goals set out in *Executive Order 2007-02S*.

Trends

The Facility Management section in conjunction with ODPS Administration, along with input from other divisions has primarily been responsible for developing the Capital Budget and its implementation. The Facilities Management section has also acted as the conduit in providing the centralized facility-related direction and services to all ODPS owned and leased facilities.

Facilities management has sought to build at least one new Patrol post, on its current site where possible, each year with its allocation of Minor Capital monies. It would also attempt to construct a new District Headquarters, Patrol post, Radio Shop, etc with monies from the Capital budget. While at the same time tracking numerous smaller remodeling, maintenance projects, lease site build outs, moves of Drivers Examination Stations, Deputy Registrars, BMV District Offices, OIU field Offices and Reinstatement Offices.

Typically, with design of new projects, the department will begin the design process by completing a review of the project site and all environmental impacts to the project. When deciding the building location multiple factors are considered such as; the site and orientation with consideration of both solar gain, heating and cooling loss, wind and winter impacts, along with capitalizing on natural ventilation strategies, are analyzed to reduce energy consumption and maximize occupant comfort and morale.

Through the design process, careful attention is given to the review of construction documents for completeness in detailing foundation, wall and roof assemblies to minimize energy consumption. Life cycle cost analysis is employed in the selection of mechanical HVAC equipment to ensure the most economical operation of building systems. Lighting and their controls are reviewed to minimize electrical consumption. Low flow and low consumption plumbing fixtures are specified. Roofing materials are analyzed and selected on the basis of minimizing heat gain and high reflectance levels. Landscape elements are provided and placed to minimize summer heat gain and winter heat loss, and to eliminate the heat island effect in addition to enhancing the exterior design of the facility.

The buildings owned and leased by ODPS have an insatiable appetite for consuming energy, which in turn consumes a large portion of our operating budget. There are various figures on how buildings consume energy but most agree it breaks down into four main areas:

- 29% Lighting systems
- 28% Air Handling
- 24% Cooling systems
- 19% Office equipment, elevators, some heating, and other.

The trend and most prudent approach for new construction, major remodeling, etc. in today's environment is to use the U.S. Green Building Council (USGBC), LEED standard.

The LEED Green Building Rating System is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. LEED is the nationally accepted benchmark for the design, construction and operation of high performance green buildings. LEED gives building owners and operators the tools they need to have an immediate and measurable impact on their buildings' performance. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development,

water savings, energy efficiency, materials selection and indoor environmental quality.

LEED certification provides independent, third-party verification that a building project meets the highest green building and performance measures. All certified projects receive a LEED plaque, which is the nationally recognized symbol demonstrating that a building is environmentally responsible, profitable and a healthy place to live and work.

There are both environmental and financial benefits to earning LEED certification. LEED-certified buildings provide for:

- Lower operating costs and increased asset value,
- Reduce waste sent to landfills,
- Conserve energy and water,
- Healthier and safer for occupants,
- Reduce harmful greenhouse gas emissions,
- Demonstrate a commitment to environmental stewardship and social responsibility.

Even though environmental awareness is not new to the construction industry, it has often come with a heftier price tag. However, as the industry has grown the overall market has responded offering more options for green design and construction. Whereas before you may have had only one supplier of recycled products you have choices among three to four. This means greater selection and prices that are more competitive. As corporations see an increased bottom line due to sustainable construction, it drives the train into green technology, research and design, thus bringing the price down for everyone.

Willingness to look at life cycle cost of a building, as well as the first costs, the long term financial benefits of building green, make more sense, from a financial and environmental standpoint.

Included in the Appendix is a section from the U.S. Environmental Protection Agency on the cost effectiveness of building green.

Further review of the cost of building green can be found in an article published by the Massachusetts Technology Collaborative by Gregory H. Kats. He concluded that Green Buildings provide financial benefits that conventional buildings do not. These benefits include energy and water savings, reduced waste, improved indoor environmental quality, greater employee comfort/productivity, reduced employee health costs, lower operations, and maintenance costs. As green construction has become main stream, costs have decreased. According to Kats, a LEED Gold building will use 37% less energy than one built to current code. Kats went on to state that "financial benefits of green design are between 50-70 dollars a square foot in a LEED building over 10 times the additional cost associated with building green. *Reference #6*

Current Programs and Accomplishments

Energy audit forms were distributed to the field for ODPS owned buildings they have been completed and returned to the energy efficiency work group. These energy audits will be used as periodic examination of our energy system to ensure that energy is being used as efficiently as possible.

Energy saving opportunities identified in the audit are being implemented. Most of the opportunities are being implemented with little or no cost implication. Among some of the items identified and implemented to date are as follows:

Illumination

A re-lamping program was instituted in many of the older facilities to achieve significant cost savings in a relatively short period. Incandescent light bulbs were replaced with compact fluorescent lamps (CFLs). We began replacing fluorescent T12s lights with T8s and replaced the ballasts with an electronic ballast where required.

Exit signs with incandescent lighting have been replaced with light emitting diode (LED) lamps. LED models use approximately 70 per cent less energy than conventional units and can provide significant energy and cost savings.

Facilities have been equipped with occupancy sensors where practical. Occupancy sensors are motion-sensing devices that automatically turn on and off equipment, usually light fixtures. They save energy by turning off lights when areas are not in use. Case studies have shown energy savings from 25-75%.

ODPS is moving forward on its first LEED Project with a new building (Ohio State Highway Patrol's Ironton Post) listed as a LEED project in the *Ohio Register.*

If built to LEED standards this will save energy, reduce carbon emissions, save water, waste in the landfill, reduce operating costs all the while providing a healthier environment for the occupants.

It will also show ODPS's commitment to environmental stewardship and social responsibility.

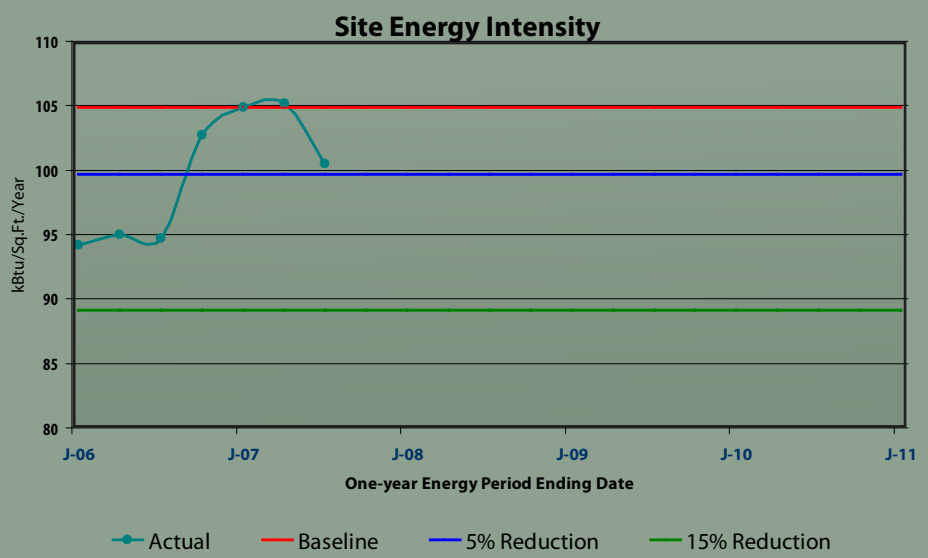
FACILITIES | *Action Steps*

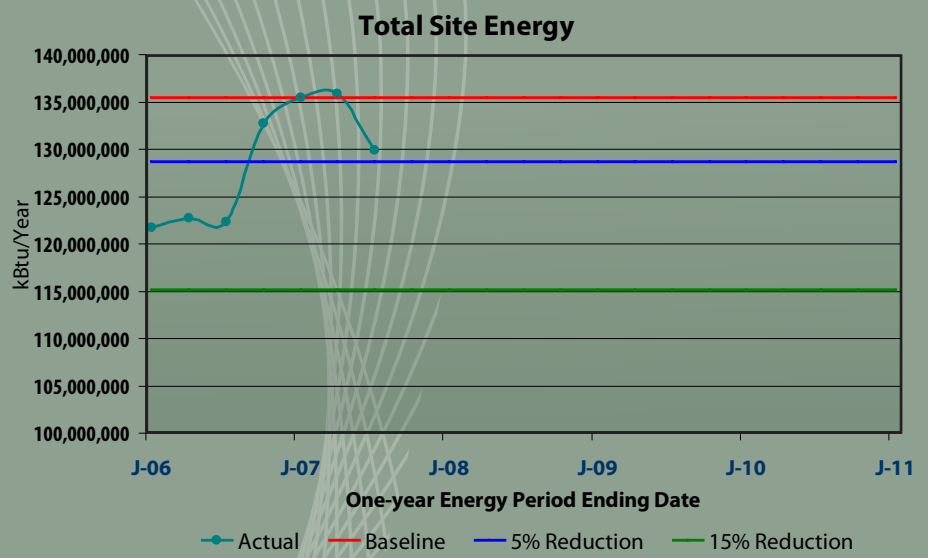
- Develop and phase in LEED Standards for building design, construction, performance, maintenance and land use that is consistent with LEED and energy star standards.
- Incorporate energy efficiency line item request in future Capital Budget Requests.
- Identify posts such as Marysville, Georgetown, Elyria, Van Wert, and Canton, where we can create natural regeneration where grass is not cut and nature is allowed to take its course.
- Institute a no-pesticide policy for the grounds at all of the facilities. This is an energy cost saving measure as well as a sustainable practice. Research shows there are numerous health and environmental impacts from the application of lawn chemicals.
- Facility Management in conjunction with ODPS Senior Staff needs to develop an in-depth plan to identify the long-range capital plan needed to achieve climate neutrality. As appropriate, obtain at a minimum a LEED- silver certification.
- Design buildings that generate some of their own energy on site.
- Facility Management in conjunction with OSHP/ ODPS Senior staff should develop a strategic plan to reduce the number of facilities it owns and operates.
  With the new structure of the operational dispatching, along with new technology such as Computer Aided Dispatch (CAD) system, are there facilities that can be combined? Innovative thinking should take precedence over imaginary lines drawn on a state map that identify districts. For example, combine a Delaware and Marion Post together. The Delaware Post has lost a tremendous amount of territory it once covered. It no longer provides service to Union County, it has seen a reduction in the area it patrols in Franklin County, and it has lost a large portion of land to the City of Columbus, which includes several miles of interstate 71. This appears to be a trend that will continue in the future. The post itself has been annexed by the city of Delaware. The growth around the post has made it more difficult to enter/exit during rush hour traffic. Can any of the other agencies combine facilities?
- Facility Management needs to develop a plan that will aggrandize energy efficiency targets working toward potential climate neutrality into capital and minor capital projects proposals.
  Facility Management's plan for facilities and grounds should include several or at least one sustainable item such as native landscaping, green roof etc., in all of its new construction and major renovation projects.

All of the above standards appear to be coming in the future from various Federal and State legislation. For example, the Energy Independence and Security Act of 2007 established the Office of High-Performance Green Buildings (OHPGB) in the U. S. General Services Administration.

At the state level, the future should be viewed, as it is mentioned in Sub. H. B. No. 251 for the Ohio School Facilities Commission, who has just recently developed and instituted the LEED standard for school construction.

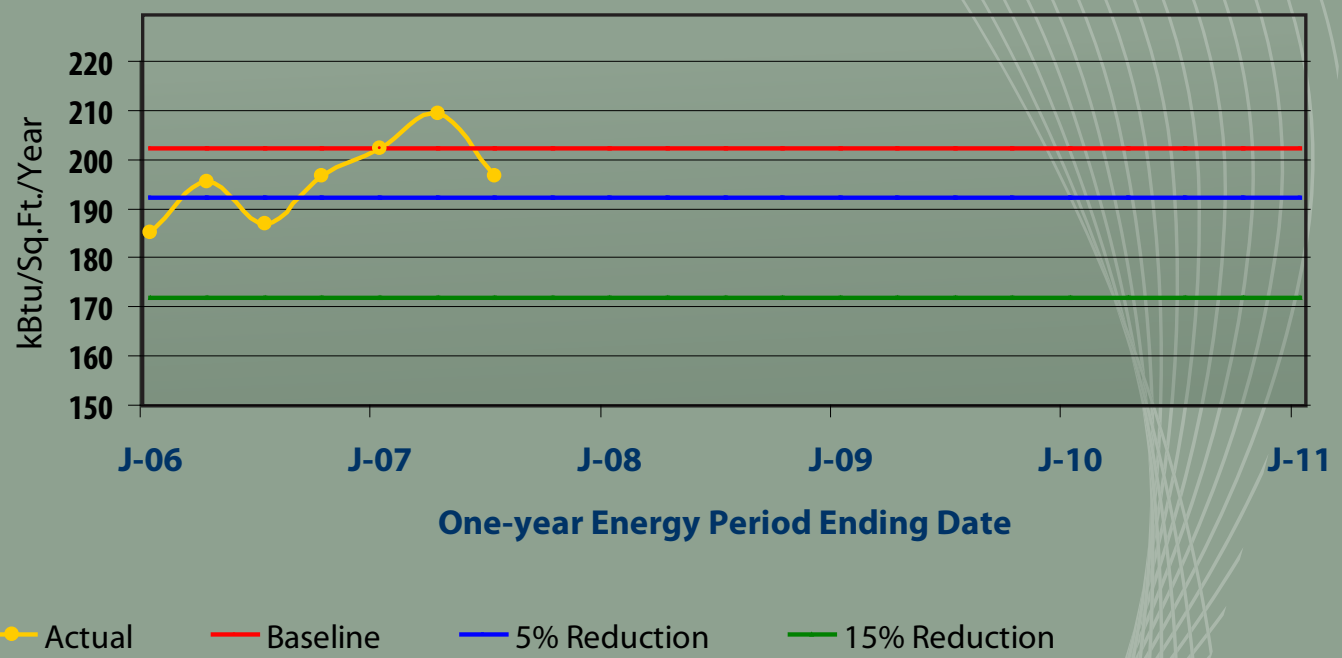
Comparative Energy Performance Report
Fiscal Year 2007: E nergy used in 92 ODPS facilities.
Source: Office of the Governor's Energy Advisor | State of Ohio





Comparative Energy Performance Report
Fiscal Year 2007: E nergy used in 92 ODPS facilities.
Source: Office of the Governor's Energy Advisor | State of Ohio

Weather Normalized Source Energy Intensity



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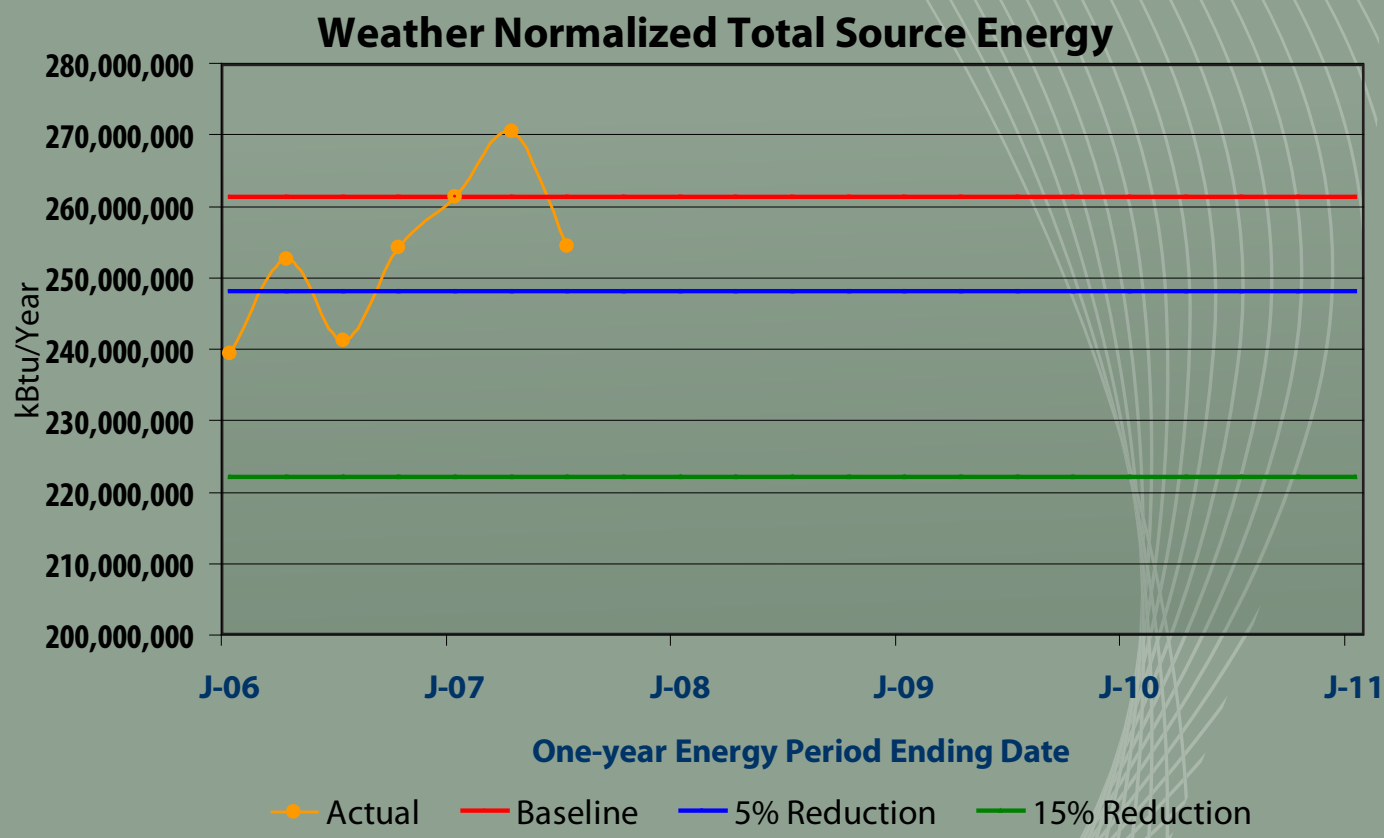

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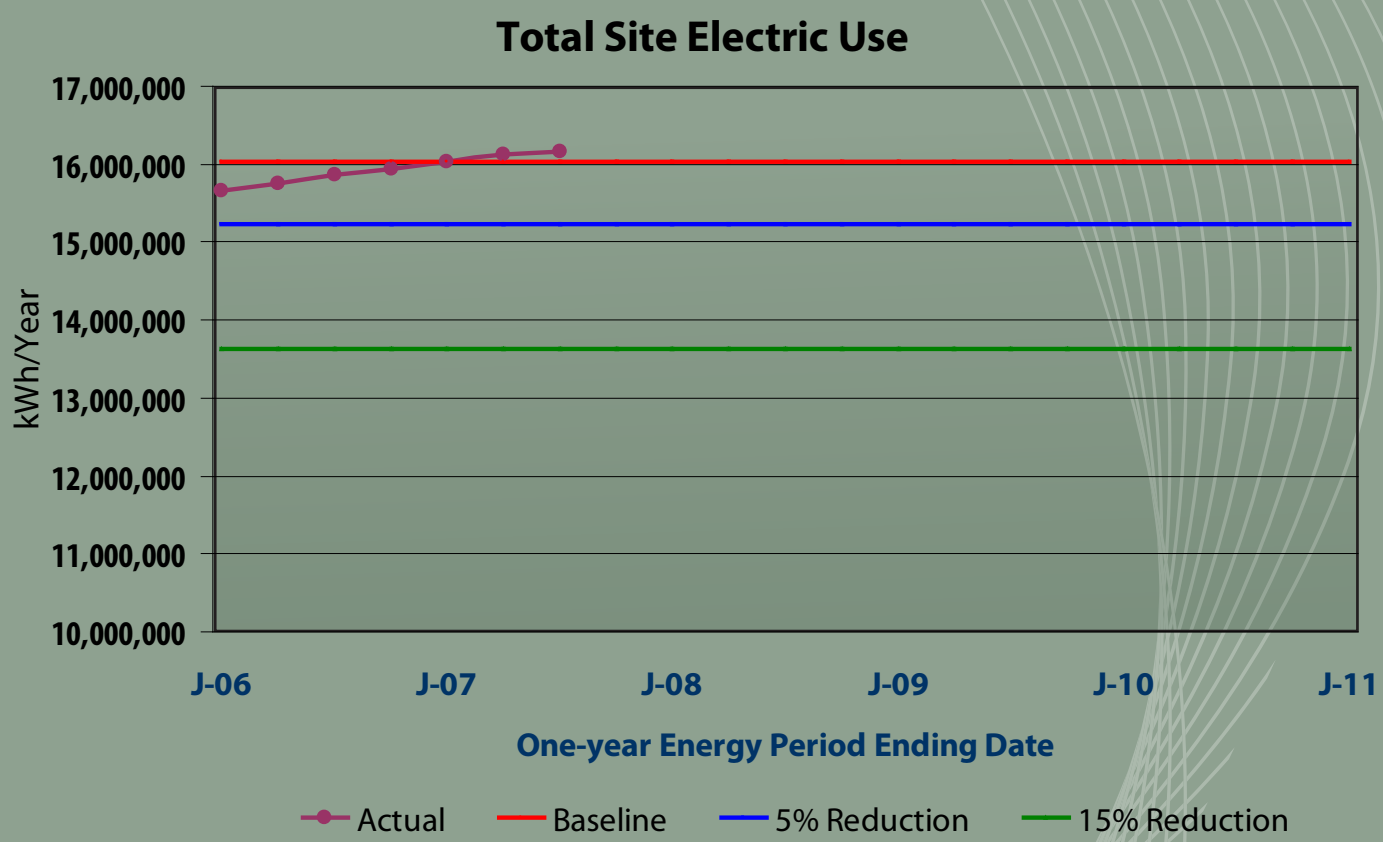

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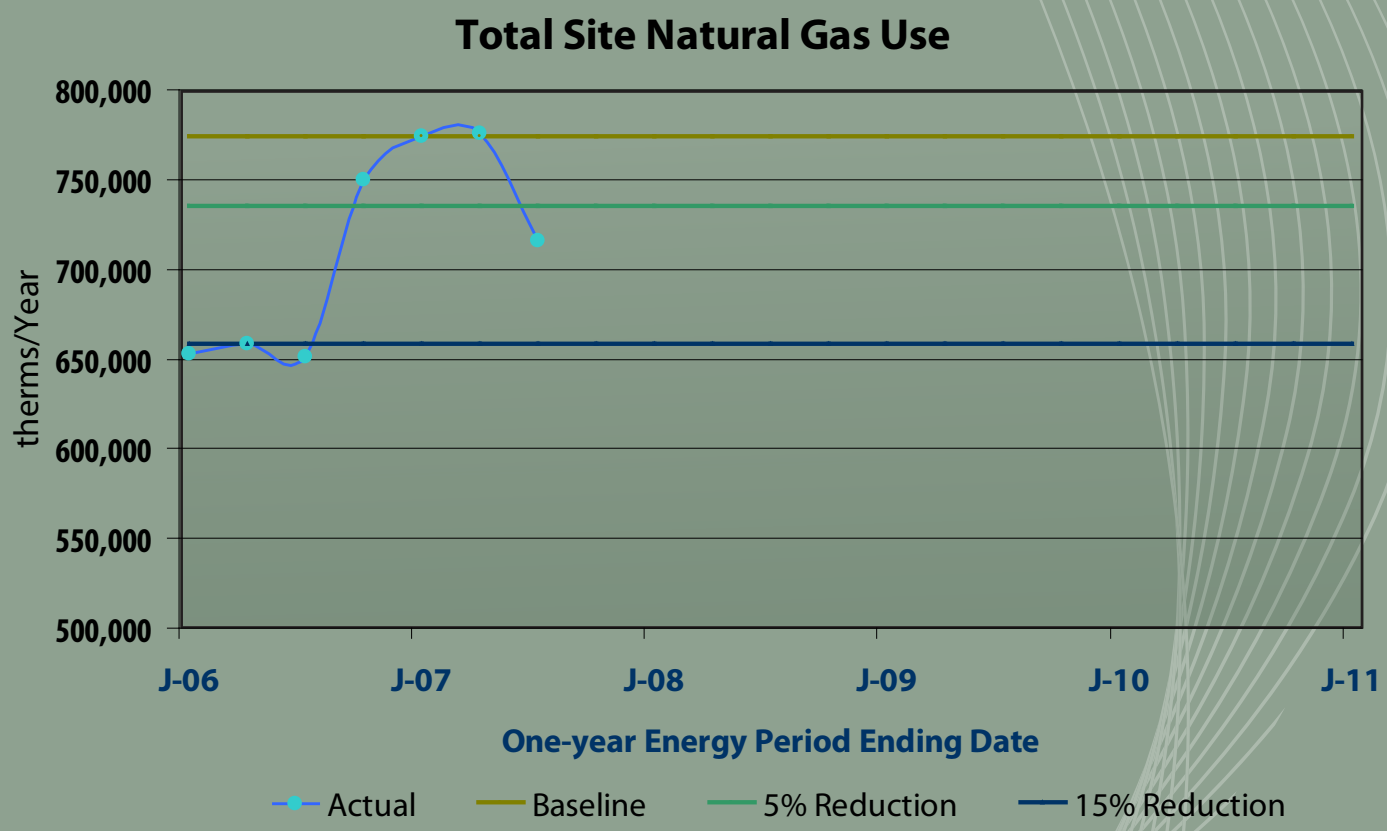

Facilities | *Challenges*

The Department has numerous older buildings. Updating and renovating them using LEED or even non LEED standards can be expensive. Finding funding for these improvements in the current economic times will be difficult.

Education of ODPS staff and outsiders must take place to eliminate the perception that LEED certification is too costly for it benefits i.e. first cost can mean lower life cycle cost.

Ohio Department of Public Safety
Education · Service · Protection

Fleet Vehicles Transportation

Target
Measure
Background, Trends

- ***Reduce vehicle fleet emissions by utilizing E-85 fuel.***
- ***Reduce fleet fuel usage by 5% by the end of calendar year 2009 and by 10% by the end of 2011 over calendar year 2007 usage.***

Target

- By the end of Calendar year 2009, compared to 2007 reduce annual fuel use by 5% (from 3,233,323 gallons to 3,071,657). This reflects a savings of 161,666 gallons of fuel.
- Percentage of diesel vehicles using biodiesel to increase to 95% (B.E.A.R. & Command Vehicles are unable to use biodiesel).
- Increase total biodiesel fuel usage by 25% by 2008.
- Obtain an enforcement fleet of flex fuel vehicles by 2011, and maximize the use of E-85.
- By 2028, have a 100% clean and green fleet. Clean, green vehicles are vehicles that are either alternative fueled vehicles or vehicles that have EPA fuel efficiency ratings of 45 mpg or greater.

Measure

- Total annual fuel used by ODPS.
- Total annual amount of biodiesel being purchased per diesel vehicle.
- Enforcement vehicles purchased by fleet that are flex fuel.
- The long-term goal (10-20years) will be to operate a fleet that is totally green and clean. That is, fleet management will take a more active roll with DAS to ensure vehicles are on the state term contract that are the most cost effective, highest MPG's and lowest emission vehicles possible while still meeting the operational needs of each department.
- All new vehicles purchased by fleet must meet this standard. Fleet should turn over in a six-year time span.
- Newly enacted federal and state legislation will have tremendous impacts on our fleet operations from an economical, environmental and social standpoint. Below is a discussion of the terminology associated with the fuel energy movement as it pertains to fleet. What impact will it have on the ODPS and what will we do to meet these challenges? Below we will look at these questions and hopefully determine a direction on where we will go as a department and leader in this movement.

Background, Trends

The fleet department is responsible for purchasing, maintaining and disposing of fleet vehicles for all of ODPS. On average, the fleet department replaces 546 vehicles annually with new vehicles, based upon the needs of each agency within ODPS.

ODPS currently operates a fleet of 1899 motor vehicles in its operations broken down as follows: Adm. (11), BMV (92), EMA (30), Inv Unit (139), Homeland Security (2) and OSHP (1625). Fuel represents 73 % of the overall expense for the ODPS Fleet which equated to $8,377,801.34 in calendar year 2007.

Almost 33% of U. S. carbon dioxide emissions can be attributed to the gasoline internal-combustion engines of cars and light trucks. ODPS Fleet consumes more than 3.2 million gallons of gasoline and diesel fuel a year, which contributes a significant amount of harmful emissions being released into the atmosphere. These emissions contribute to poor air quality, health issues and climate change.

State Police and Highway Patrol agencies were surveyed to ascertain if they have a written policy on green fleets, if they were mandated to purchase FFV's, HEV's, and use flex fuel. They were also asked about any policies that govern fleet operations in terms of fuel consumption, restrictions on miles driven and no idle policies. Of those that responded no agency had a no idle policy, restricted miles traveled or fuel consumption. Some fleet departments were being mandated to purchase FFV's. Again, ODPS can take the lead in this area.

Newly enacted federal and state legislation will have tremendous impacts on our fleet operations from an economical, environmental and social standpoint.

The Energy Independence and Security Act of 2007 will help reduce America's dependence on oil by:

- Increasing the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) requiring fuel producers to use at least 36 billion gallons of biofuel in 2022. This represents a nearly five-fold increase over current levels. This will equate to greater production of biofuels which should in turn decrease the cost of fuel all the while reducing greenhouse gasses.
- Reduce U.S. demand for oil by setting a national fuel economy standard of 35 miles per gallon by 2020 – which will increase fuel economy standards by 40 percent and save billions of gallons of fuel. This is the first statutory increase in fuel economy standards for automobiles since they were enacted in 1975. (*Reference #9)* This will help ODPS in its long range plan to increase our fleet's average fuel economy.

As part of the Governor's *Executive Order* agencies are to reduce their dependence on foreign oil by acquiring alternative fuel vehicles, including hybrid electric vehicles, along with setting numerical goals, with timeline, for acquiring these vehicles. ODPS will take this a step further and develop a long-term plan that will serve as the framework of how to develop a green fleet, better manage our fuel and adjust to an ever-changing market.

Ohio Department of Public Safety
Education · Service · Protection

Fleet Vehicles Transportation

Current Programs and Accomplishments, Action Steps

Current Programs and Accomplishments

A presentation was given to all ODPS Departments, all District Headquarters staffs, and Post Commanders, some DX personnel and facility management employees on how to save and conserve energy when operating a vehicle.

An awareness campaign which included fuel saving tip posters was distributed to all Divisions within ODPS for their use.

There are currently several policies already in place that serve ODPS very well when it comes to managing the fleet: More important policies that should be reviewed on a regular basis are: DPS Policy 300.04, Support Vehicle Service and Maintenance, DPS Policy 203.01 Operation of Support Vehicles, and OSP Policy 300.21 Ford CVPI Marked Enforcement Vehicle Maintenance.

Action Steps

At this time, the single most important action that ODPS can take as an agency to reduce our dependence on foreign oil, reduce emissions and curb global warming is to purchase vehicles that are more fuel efficient. This would also include where feasible and cost effective the introduction of gas-electric hybrids into the fleet. ODPS will monitor the development of fuel and vehicle technology currently being tested and make the best decisions for ODPS on what the current market offers.

The action steps recommended for meeting ODPS's energy efficiency goals would be as follows:

- Optimize the fleet size;
- Increase the CAFÉ standard;
- Minimize miles traveled to the extent possible;
- Minimize CO_2 emissions;
- Reduce vehicle size where appropriate; and
- Continue to increase number of vehicles that use alternative fuels.

There are currently only two means available to ODPS to meet the goal of reducing fuel emissions and fuel use:

- Cleaner operating vehicles
  i.e., cleaner fuels, and cleaner engine operation.
- Increased efficiency
  more efficient vehicles and more efficient use, i.e., burning less fuel.

Cleaner operating vehicles

Current problems: As discussed earlier internal combustion engines contribute enormous amounts of pollutants into the atmosphere, many of which are regulated by the Federal Clean Air Act. However, Carbon Dioxide (CO_2) is a major vehicle emission that is not regulated. It has been cited as the most significant source of greenhouse gas that contributes to global warming. Rough estimates show that for every gallon of gas burned it puts approximately twenty pounds of CO_2 in the air.

Measures to accomplish cleaner vehicles

ODPS has switched from diesel fuel to a biodeisel fuel in the diesel fleet. Manufactures advised not to use biodiesel in specialty vehicles i.e. the BEAR and Command vehicle. Biodiesel is a clean burning alternative fuel produced from domestic, renewable resources such as new and used vegetable oils and animal fats.

Flex Fuel Vehicles (FFVs) are designed to run on gasoline or a blend of up to 85% ethanol (E85). Except for a few engine and fuel system modifications, they are identical to gasoline-only models. FFVs have been produced since the 1980s, and dozens of models are currently available.

FFVs experience no loss in performance when operating on E85. However, since a gallon of ethanol contains less energy than a gallon of gasoline, FFVs typically get about 20-30% fewer miles per gallon when fueled with E85. *Reference #10*

ODPS has already started to purchase FFV's to put in the current fleet. The majority of enforcement vehicles are the Ford Crown Victoria Police Interceptor (CVPI), manufactured by the Ford Motor Company, who until this year did not offer a FFV in the police package. In 2008 fleet management will purchase 426 new CVPI that are FFV. Fleet will continue to purchase FFVs in the future until the fleet is totally FFVs, which is estimated to be completed by Fiscal Year 2010. This will significantly reduce the greenhouse gas emissions by the ODPS motor vehicle fleet.

Alternative fuels are not only a good idea, state vehicles capable of using flex fuels are required to use them as they become more readily available.

The average cost of E-85 versus gasoline in the Crown Victoria Police Interceptor (CVPI).

Average E85 fuel price in our region	$2.29 per gal
Average Gasoline price in our region	$2.72 per gal
EPA Vehicle Fuel Economy Rating using E85	12.80 miles per gallon
EPA Vehicle Fuel Economy Rating using Gasoline	17.78 miles per gallon
Average Miles Driven per year	15,000 miles
Cost to drive the vehicle fueled with E85	$2,683.59 per year
Cost to drive the vehicle fueled with Gasoline	$2,294.71 $ per year
Gallons of gasoline saved by fueling with E85	667.86 gallons per year
Greenhouse gases NOT emitted	3827.96 lbs of gases per year

Starting with fiscal year 2008 all enforcement vehicles purchased by DPS will have flex fuel capabilities. The following chart demonstrates planned FY 08 purchases.

FY08 ODPS Vehicle Replacement Plan	Planned Replacements	AFV	Non-AFV
Mid-Size Sedan	38	38	
Mini Passenger Van	11	11	
12 Passenger Van	1		1
¾ Ton Cargo Van	7		7
1 Ton Cargo Van	10		10
¾ Ton Pick Up	4		4
Bus	1		1
CVPI (Law Enf)	426	426	
Mid-Size Sedan (Law Enf)	23	23	
SUV (Law Enf)	21	21	
TOTALS	**542**	**519**	**23**

AFV replacements are based on the FY07 state contract and information.

Action Steps (continued)

Increased efficiency – more efficient vehicles and more efficient use.
Problem - Nationally, and ODPS is no exception, fuel usage has increased, as has the average number of miles driven per year. This increased appetite for fuel means an increased demand for oil production which in turn equates to degrading our natural resources, air pollution and global warming, all of which drive up the cost.

Measures to increase efficiency

The *Energy Independence and Security Act* of 2007's goal to improve vehicle fuel economy and help reduce dependence on oil, set new *Corporate Average Fuel Economy Standards* (CAFE). The legislation calls for a 35 mpg CAFE standard for cars and light trucks by 2020, with "maximum feasible" increases beyond this date.

The fuel economy provisions of the energy bill represent a giant step forward, bringing us cars and light trucks that use almost 30% less fuel than today's vehicles, and putting heavy trucks on the path toward greater efficiency as well. The new standards will save over 1 million barrels of oil per day by 2020 and close to 2 million barrels per day by 2025, while delivering commensurate reductions in vehicles' greenhouse gas emissions and saving consumers tens of billions of dollars annually. (*Reference #11)* This technology will also have a trickle down effect and will help ODPS reach its goals.

Proper inflation of tires is energy efficient. The new CVPI package comes with a Tire Pressure Monitoring System, which will warn drivers of tire under inflation. An active pressure sensor with a radio transmitter is mounted inside the tire on each wheel (except the spare). A receiver inside the vehicle monitors each transmitter, and if tire pressure is not within specified limits, it activates a warning.

Fleet Management and various agencies' senior staffs need to develop a review process when replacing vehicles that would include "right sizing" fleets by reducing size and eliminating old and unused vehicles. This would provide a reduction in fuel expenditures, decrease CO_2 emissions, and strain on the budget.

Matching duty requirements of personnel to the smallest possible vehicle for the task would be a fuel saving strategy with huge financial rewards. For example, OSHP could provide non-first responders, compact vehicles which would save money on the initial investment; while achieving higher mpg's, and lower emissions. Should Staff Lieutenants and Lieutenants in the field be equipped with a smaller police package vehicle such as a Chevrolet Impala? This group does not usually perform routine patrol functions. The downsized vehicle and equipment would be at a lower cost, better fuel efficiency and lower emissions.

Idling Guidelines

It would be difficult to estimate the savings an anti-idling policy would generate since it is not known how much time ODPS vehicles spend idling. However, just a 1% reduction in idling may save as much as $83,778 per year on average based on DPS fuel usage in 2007. This policy would not eliminate all idling, and on a hybrid vehicle the engine would switch to a battery to operate. OSHP without a doubt spends more time idling then any other division.

Can the use of solar panels allow Patrol and MCE vehicles to sit stationary and off for a reasonable period without draining the electric source? This type of policy would have a great impact on our ability to demonstrate commitment to reducing fuel usage, save money, and reduce global warming.

Maintenance

According to the U.S. Department of Energy, properly inflated and aligned tires improve gas mileage around 3.3%. It is also well documented that performing the routine maintenance on vehicles as outlined by the vehicle manufacturer can increase fuel efficiency and reduce emissions. It is important to follow the scheduled maintenance of vehicles found in *DPS Policy 300.04, Support Vehicle Service and Maintenance*, and *OSP Policy 300.21 Ford CVPI Marked Enforcement Vehicle Maintenance.*

Fleet Vehicles Transportation

Action Steps (continued)

Purchase Plan for Alternate Fueled Vehicles (AFV) 2007 – 2013.

Existing non-AFV vehicles to be replaced with AFV vehicles.

VEHICLE	FISCAL YEAR (FY) REPLACEMENT PURCHASE							TOTAL	No State Contract*	Confiscated Vehicles	Specialty Vehicle	Grand Total
	FY07	FY08	FY09	FY10	FY11	FY12	FY13					
Mini & 1/2 T Cargo Van	6	6	1	4	3	1	0	21				21
3/4 T Cargo Van	4	6	5	7	8	8	5	43	*	1		44
1 T Cargo Van	7	4	3	2	3	3	3	25	*	1		26
E350 VAN (UTIL)											1	1
BOX TRUCK											1	1
TOW TRUCK											1	1
BUS		1						1	*			1
C3500 TRUCK			1					1	*			1
MOBILE DX VEHICLE											3	3
ARMORED VEHICLE											2	2
12-PASS VAN		1						1	*			1
MINI PASS VAN		3	3	2	1	1	1	11				11
STATION WAGON			3					3				3
SUV	2	2	6	1				11		6		17
COMMAND VEHICLE											3	3
EL CAMINO										1		1
1/2 T PICK UP										7		7
3/4 T PICK UP		4	2	5	5	1		17		1		18
1 T PICK UP						2		2		2		4
C & C TRUCK	1	1	1					3	*			3
MEDIUM DUTY TRUCK			1	1		1		3	*			3
MID SIZE SEDAN	22	20	10	5	2			59		7		66
POLICE PKG SEDAN		6	10	45	15			76	*			76
CROWN VIC PP		431	413	407				1251				1251
TOTALS	**42**	**485**	**459**	**479**	**37**	**17**	**9**	**1528**	*	**26**	**11**	**1565**

* AFV Vehicle replacements are not currently available on state contract.
Note: Confiscated vehicles are not in budget replacement plans at this time. Specialty vehicles do not have a set replacement schedule. Replacement is based on operating cost and need.

OHIO DEPARTMENT OF PUBLIC SAFETY
EDUCATION · SERVICE · PROTECTION

FLEET VEHICLES TRANSPORTATION | *Metrics*

ODPS fuel usage for Calendar Years 2007 and future target savings.

DIVISION	2007 GALLONS FUEL USED	5% REDUCTION	TARGET GALLONS FOR END OF 2009	10% REDUCTION	TARGET GALLONS FOR END OF 2011
ADM	8,586.0	429.30	8,156.70	858.6	7,727.4
BMV	64,537.5	3,226.80	61,310.70	6,453.75	58,083.75
EMA	27,595.3	1,379.76	26,215.54	2,759.53	2,759.53
Inv. Unit	127,123.2	6,356.16	120,767.04	12,712.32	114,410.88
OSHP	2,896,525.6	144,826.28	2,751,699.40	289,652.56	2,606,873.1
OSHP MCE	108,956.0	5,447.80	103,508.20	10,895.60	98,060.4

Adm. 5% reduction spread over entire fleet would mean that their 11 vehicles would need to reduce their yearly gallons of gas by 39 gallons each. (10%=78 gallons per vehicle)
Or 5% spread over a year = 3.25 gallons a month

BMV 5% reduction spread over entire fleet would mean that their 92 vehicles would need to reduce their yearly gallons of gas by 35 gallons each. (10%= 70.14 gallons per vehicle)
Or 5% spread over a year = 2.91 gallons a month per vehicle

EMA 5% reduction spread over entire fleet would mean that their 30 vehicles would need to reduce their yearly gallons of gas by 45.9 gallons each. (10%= 91.98 gallons per vehicle)
Or 5% spread over a year = 3.82 gallons a month per vehicle

INV Unit 5% reduction spread over entire fleet would mean that their 139 vehicles would need to reduce their yearly gallons of gas by 45.2 gallons each. (10%= 91.45 gallons per vehicle)
Or 5% spread over a year = 3.76 gallons a month per vehicle.

OSHP and OSHP MCE 5% reduction spread over entire fleet would mean that their 1625 vehicles would need to reduce their yearly gallons of gas by 92.47 gallons each. (10%= 184.95 gallons per vehicle) Or 5% spread over a year = 7.70 gallons a month per vehicle.

ODPS fuel usage for Calendar Years 2006 and 2007 for all divisions.

ODPS Fuel Usage Calendar 2006					
DIVISION	MILES TRAVELED	GALLONS OF FUEL	FUEL COST	MPG	CPM
ADM	164,106	9,569.0	$23,311.46	16.59	0.2043
BMV	1,664,271	69,663.8	$162,744.34	23.50	0.1284
EMA	496,180	28,156.4	$66,276.70	17.64	0.1557
INV UNIT	2,723,010	115,429.9	$268,900.00	23.58	0.1389
OSHP	45,675,635	2,917,818.0	$6,632,913.66	15.66	0.2077
OSHP MCE	1,455,465	109,389.0	$250,773.12	13.32	0.2289
TOTAL	52,178,667	3,250,026.1	$7,404,919.28	16.05	0.1419
ODPS Fuel Usage Calendar 2007					
ADM	145,263	8,586.0	$22,560.22	16.99	0.2025
BMV	1,490,753	64,537.5	$165,288.52	23.06	0.1466
EMA	477,603	27,595.3	$70,898.50	17.37	0.1649
INV UNIT	2,826,606	127,123.2	$326,404.80	22.21	0.1522
OSHP	45,049,091	2,896,525.6	$7,511,013.22	15.55	0.2275
OSHP MCE	1,433,770	108,956.0	$281,636.08	13.08	0.2537
TOTAL	51,423,086	3,233,323.6	$8,377,801.34	15.90	0.1629

The last quarter of CY 2007 shows ODPS's commitment to use alternative fuels.

ODOT BULK FUEL USE		
2007	E85 GALLONS	BIO-DIESEL GALLONS
December	399.5	448.5
November	254.1	0.0
October	195.3	561.4
TOTAL	**848.9**	**1,009.9**

VOYAGER REPORTED BY DAS		
2007	Gallons	Gallons
Sept - Dec	896	0

BULK FUEL USE TOTAL AND % OF GOAL MET				
2007	Gallons Used	Gallons Used	2007 Goal	% of Goal Met
E85	1,744.9	0	2,021	86.3%
Bio-Diesel	0	1,009.9	1,443	70.0%

Additional Planning & Research

ODPS Administration should consider incentives such as:

- Provide up front parking or designated parking spaces for people who drive gas-electric hybrid vehicles.
- Administration can explore or allow a more flexible or compressed work schedules to reduce traffic congestion, fewer trips etc.
- Educate ODPS employees on safe economical driving habits.
- The addition of solar panels in marked vehicles: Can the use of solar panels allow Patrol and MCE vehicles to sit stationary and off for a reasonable period of time without draining the electric source to allow us to save fuel and reduce emissions. Recommend that the Technology Communication Services section explore this further.

Challenges

Hybrid-electric vehicles (HEVs) have performed well in the last few years for various fleet departments. The challenge will be when dealing with tight budgets and turbulent economic times selling the fact that even though HEVs cost less to operate than conventional vehicles, their higher capital cost precludes making a substantial transition to hybrids based on financial considerations alone. For example the two listed vehicles below are what are on State Term Contract this year.

Vehicle	Expense
Ford Focus	$13,198 (35 mpgs)
Honda Civic Hybrid	$ 23,050 (45 mpgs)
Ford Focus	90,000 miles ÷ 45 = 2000 x $3 = $6,000
Honda Civic Hybrid	90,000 miles ÷ 35 = 2571 x $3 = $7,714

The Honda's initial cost is $9,852 higher than the Ford, however on an average cost of $3 per gallon of gas over the 90,000 mile life of the vehicle saves 571 gallons of gas but only save $1,714, thus the hybrid will still cost $8,138 more.

ODPS has little or no control of the vehicle technology market. Achieving increased fuel economy will be a top priority, however it will be difficult in classes other than compacts until the technology is introduced into the mainstream for ODPS to purchase.

Social

A clean and green fleet implementation plan is the way for the ODPS to implement affordable and sustainable vehicles that illustrates our leadership role towards reducing our fleet emissions and fuel use. This element demonstrates the ODPS's commitment to reaching and exceeding the goals set by the Governor in his Executive Order and requirements of H. B. 251. It is a map for ODPS to contribute in a positive manner, to healthier and sustainable environments in the communities that they impact throughout the state. Bottom line we reduce our consumption of non-renewable energy, conserve energy and save money.

Conclusion

In keeping with the vision of Governor Strickland's *Executive Order 2007-02S* and a twenty year plan, ODPS's approach will concentrate on education, conserving fuel, energy and natural resources, utility waste and employing new strategies, to accomplish energy savings while improving the quality of the ODPS environment.

The energy conservation/reduction plan was divided into three areas: Energy, Facilities, and Fleet. In each of the sections the history, current accomplishments, action plans and recommendations/research for the future were made. It is through this plan that ODPS will have energy efficient operations and reduce operating expenses, while simultaneously reducing our greenhouse gasses and protecting the environment.

ATTACHMENTS | BLUEPRINT FOR ENERGY EFFICIENCY

Definitions	
References	
Appendix A	Governor's Executive Order 2007-02S
Appendix B	House Bill 251
Appendix C	ODPS Policy 301.08 Energy Conservation and Audit
Appendix D	ODPS Policy 301.08 Energy Conservation and Audit Checklist
Appendix E	ODPS Ways To Save Energy
Appendix F	Internet Resources

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State of Ohio
Office of the Governor
Executive Order 2007 – 02S
Coordinating Ohio Energy Policy and State Energy Utilization

1. Creating the Governor's Energy Advisor. Ohio is one of the most energy abundant states in the country, rich with a diverse array of energy resources ranging from fossil fuels to renewable resources. Ohio's economy also ranks among the most energy-intensive in the nation, home to energy-dependent industries ranging from agriculture to manufacturing. The State of Ohio's responsibilities for development and implementation of policy and regulation of energy issues are presently fragmented among myriad state organizations. Accordingly:
    a. I hereby create the role of Governor's Energy Advisor, to serve as my principal advisor on all energy-related issues.
    b. I authorize the Governor's Energy Advisor to coordinate energy policy for the State of Ohio across state agencies, boards and commissions.
    c. The Energy Advisor will secure the necessary resources to offer advice and coordination on energy policy.
    d. The current Executive Director of the Ohio Air Quality Development Authority is designated to serve as my Energy Advisor, in addition to continuing to carry out his current responsibilities.
2. Coordinating Energy Policy. Dozens of state agencies, commissions, and boards play roles in energy policy and regulation. As a result, energy issues appear within everyone's scope, but rarely reach the top of anyone's agenda. At the same time, energy is an essential ingredient in powering Ohio's economy, protecting our environment, and employing Ohio workers. Accordingly:
    a. Each executive agency is directed to cooperate with my Energy Advisor on energy-related issues, naming an individual at the Deputy Director level or higher to work directly with my Energy Advisor.
    b. Non-executive state agencies and organizations are strongly encouraged to cooperate with my Energy Advisor on energy-related issues.
    c. The Governor's Energy Advisor shall sit on the Third Frontier Commission as the Governor's Science and Technology Advisor.
3. Reducing and Improving Energy Consumption by the State. It is the responsibility of state government to lead by example in reducing energy consumption in this era of steep energy prices, mounting environmental concerns, and persistent energy security risks. By improving energy efficiency and adopting advanced energy utilization technologies, we can make the most of our existing energy resources and also stimulate activity and investment in the energy efficiency services sector. Accordingly, I order the following actions:
    a. Buildings
        i. Instead of waiting until April 13 to implement various energy savings policies enacted into law last year, the affected agencies shall begin to implement those procedures immediately. This includes, but is not limited to, developing rules to establish energy efficiency and conservation standards; designing a common method to analyze the life-cycle cost of

facilities and how energy efficiency can reduce that cost; and, designing and implementing a plan to improve the state's ability to identify and purchase the most appropriate energy efficient products.

ii. The Department of Administrative Services, in consultation with the Energy Advisor, is directed to develop a tool for measuring energy consumption which can be used by all state agencies, boards, and commissions to track and measure their energy use in a common and consistent manner. Using such a tool will allow meaningful energy consumption comparisons between the various facilities maintained by state agencies. This tool shall be developed by March 16, 2007.

iii. The tool for measuring energy consumption will include means of calculating each organization's "carbon footprint" which demonstrates the impact our activities have on climate change by calculating the green house gas emissions produced by daily activities and reporting those emissions in units of carbon dioxide.

iv. Each state agency, board, and commission is directed to conduct a statewide energy audit of its respective facilities, both owned and leased. This audit will use the tool developed by the Department of Administrative Services to facilitate comparisons between similar facilities and should be completed by June 2007.

v. Upon completion of this energy audit, each state agency, board, and commission is directed to achieve an overall reduction of 5% in building energy use for its facilities within the first year of the next biennium and 15% by the end of four fiscal years.

b. Transportation

i. Each state agency is directed to take action immediately to reduce our dependence on foreign oil by requiring motor vehicle fleets operated by state government to acquire alternative fuel vehicles, including hybrid electric vehicles. Each state agency will develop a set of numerical goals, with a timeline, for acquiring these vehicles. The goals will be developed by April 15 and should use current state and federal requirements as the starting minimum point and be implemented beginning July 1.

ii. The Department of Administrative Services is directed to consult with the Energy Advisor to include transportation fuels in the energy consumption measurement tool and to develop and implement a goal-driven plan to reduce petroleum consumption by State vehicle fleets through revision of policies, adoption of technologies, and utilization of alternative fuels.

iii. In order to ensure the State fleet has access to alternative fuels, the Department of Administrative Services is directed to prepare plans to establish pumps for fuel that is 85% ethanol and 15% gasoline (known as E85 fuel) or diesel fuel made from vegetable oil or animal fats (known as biodiesel fuel) where such pumps are not otherwise available.

iv. The Department of Administrative Services, in consultation with the Energy Advisor, is directed to develop and implement a plan to raise biodiesel fuel consumption to at least 25% of State diesel purchases by January 1, 2008 if not before. Each agency, board and commission owning or leasing diesel fuel vehicles will cooperate with this plan.

4. Launching the Governor's Higher Education Energy Challenge. State-supported colleges and universities represent centers of both energy consumption and energy innovation. It will be the policy of my administration to recognize and value energy leadership. Accordingly:

a. I hereby establish the Governor's Higher Education Energy Challenge as an award and recognition program to encourage energy efficiency innovation at Ohio's colleges and universities.
b. The Energy Advisor is directed to encourage state-supported colleges and universities to establish teams of students, faculty, administrators, and staff to develop energy savings initiatives on their campuses.
c. The Energy Advisor is directed to establish procedures for identifying the most innovative of these energy-saving initiatives for recognition in the Governor's Higher Education Energy Challenge competition.

5. I signed this Executive Order on January 17, 2007 in Columbus, Ohio and it will expire on my last day as Governor of Ohio unless rescinded before then.

_____ Ted Strickland, Governor

ATTEST:

_____

Jennifer Brunner, Secretary of State

Appendix B

HOUSE BILL 251

Sub. H.B. 251

126th General Assembly

(As Passed by the General Assembly)

Reps. Uecker, Kearns, Raga, J. McGregor, Martin, Schneider, Collier, Wagoner, Bubp, Law, Brown, Williams, Mason, Hagan, J. Stewart, Hartnett, Barrett, Blessing, Calvert, Carano, Cassell, Chandler, Domenick, C. Evans, Faber, Fende, Flowers, Garrison, Hughes, Miller, Mitchell, Oelslager, Otterman, T. Patton, Raussen, Reidelbach, Schlichter, Seitz, Setzer, Skindell, G. Smith, D. Stewart, Strahorn, Webster, Yates, Yuko

Sens. Niehaus, Goodman, Schuler, Wilson, Gardner, Kearney, Padgett, Fedor, Fingerhut

Effective date: *

ACT SUMMARY

- Extends state facility energy efficiency and conservation planning requirements to any state agency, department, division, bureau, office, unit, board, commission, authority, quasi-governmental entity, or institution, including those otherwise excluded from oversight by the Department of Administrative Services (DAS).

- Modifies the energy efficiency rule-making authority of DAS's Office of Energy Services (OES) by permitting its rules to allow for a waiver of compliance and to require that each state-funded facility (except a higher ed facility) be managed by at least one building operator certified under the Building Operator Certification Program or an equivalent program.

- Requires the Office of Energy Efficiency in the Department of Development (DOD) to work cooperatively with OES in identifying available energy efficiency and conservation opportunities in state purchasing and in providing technical assistance and training to state employees involved in purchasing.

- Extends the reimbursement DAS must receive from state agencies for administrative costs related to supplies or services to include costs relating to energy efficiency and conservation programs.

- Provides for the creation of an interuniversity committee to develop guidelines for the boards of trustees of state institutions of higher education to use in ensuring energy efficiency and conservation in on- and off-campus buildings.

- Requires that the guidelines (1) provide that each board develop its own 15-year plan for phasing-in energy efficiency and conservation projects, (2) incorporate best practices, (3) require that project impact assessments include the fiscal effects of energy efficiency and conservation recommendations and plans, (4) establish mechanisms for each board to report periodically to the committee on its progress relative to the guidelines, (5) include a goal of reducing on- and off-campus building energy consumption by at least 20% by 2014, and (6) prescribe minimum energy efficiency and conservation standards for any new, on- or off-campus capital improvement project with a construction cost of $100,000 or more, and minimum standards for leased, off-campus spaces of at least 20,000 square feet.

- Requires each board of trustees to adopt rules that carry out those campus energy guidelines.

- Changes the Department of Development's Energy Efficiency Revolving Loan Program into the Advanced Energy Program for the purposes of providing advanced energy or economic development financial assistance.

- Provides that an "advanced energy project" must include technologies, products, activities, or management practices or strategies that facilitate the generation or use of electricity and that reduce or support the reduction of energy consumption or support the production of clean, renewable energy for consumers.

- Requires the Director of Development, before granting assistance, to determine that an advanced energy project will create new jobs or preserve existing jobs in Ohio or use innovative technologies or materials.

- Requires state vehicles capable of using an alternative fuel to use at least one million gallons of "blended biodiesel," instead of "biodiesel," per calendar year by January 1, 2007.

- Increases the limit on the rate of assessment that may be charged to oil or natural gas producers to fund an oil and natural gas marketing program by providing that the rate cannot exceed 5¢ rather than 1¢ per gross barrel of oil and 1¢ rather than 1/10¢ per thousand cubic feet of natural gas.

- For the purposes of the natural gas pipeline safety standards, modifies the definition of "gas" to mean natural gas, flammable gas, or gas which is toxic or corrosive.

- Requires the Ohio School Facilities Commission to issue a report comparing the "LEED for Schools" Rating System to applicable provisions in its Ohio School Design Manual.

CONTENT AND OPERATION

The act focuses on two general concerns. The first is energy consumption in state-funded facilities (including those of state institutions of higher education). As such, it focuses on OES and DAS authority regarding facility construction and leasing, state purchasing, and contracting, and on the authority of university and college boards of trustees regarding on-

and off-campus construction and leasing. The second is changing the Department of Development's Energy Efficiency Revolving Loan Program into an Advanced Energy Program. OES and DAS authority is discussed first below, followed by the act's provisions regarding higher education, its provisions regarding the Advanced Energy Program, and other changes to energy-related law.

OES/DAS authority

Construction/leasing

Scope of authority: definitions (R.C. 123.011(A)). Certain of the act's changes to the scope of OES/DAS authority occur in the context of defined terms. Under the act, OES/DAS facility construction and leasing authority extends to a "state-funded" facility, meaning any facility "funded in whole or in part through appropriation by the General Assembly or through the use of any guarantee provided by" the State of Ohio. Prior law referred to a "state-assisted facility," meaning a facility funded "in whole or in part with state or federal funds or with funds guaranteed or provided by or through a state agency."

The act revises the term "facility" to incorporate the idea that "facility" can mean *part* of a building or other structure and that, relevant to energy consumption, a "facility" is one that can include a heating, cooling, or hot water system, as in continuing law, or a refrigeration, ventilation, lighting, or other major energy consuming system, component, or equipment.

Additionally, the act defines the term "construct," with the objective that the facility construction/leasing law consistently uses the term to mean not just construction, but also reconstruction, improvement, renovation, enlargement, or other alteration of a facility.

To exclude state institutions of higher education expressly from the scope of OES/DAS authority regarding facility rulemaking (described below), the act adds a definition of "state institution of higher education" which encompasses the University of Akron, Bowling Green, Central State, University of Cincinnati, Cleveland State, Kent State, Miami, Ohio University, Ohio State, Shawnee State, University of Toledo, Wright State, Youngstown State, and the Northeastern Ohio Universities College of Medicine, and includes their boards of trustees. The term also means any community college, state community college, university branch established under continuing law (R.C. Chapter 3355.), or technical college.

Facility planning and operation; rulemaking (R.C. 123.011(A), (C), (D), and (G)). Ongoing facility construction/leasing law prohibits state agencies, including those otherwise excluded from DAS's oversight, from (1) constructing a facility of 5,000 square feet or more without having secured from the OES both an evaluation of life-cycle cost and an energy consumption analysis, prepared by a qualified architect or engineer, and (2) leasing a facility of 20,000 square feet or more without having secured an energy consumption analysis. The act expressly extends these prohibitions regarding state-funded facilities to any state agency, department, division, bureau, office, unit, board, commission, authority, quasi-governmental entity, or institution, including those otherwise excluded from DAS oversight. Under continuing law, the results of these analyses must be a primary consideration in design selection or the selection of a facility to be leased, and any request for release of capital improvement funds for facility construction must contain copies of all pertinent life-cycle cost analyses done for a facility.

Regarding rulemaking, OES was required under prior law to promulgate rules and procedures, including energy conservation performance guidelines, for conducting a life-cycle cost analysis of alternative architectural and engineering designs and developing energy performance indices to evaluate the energy efficiency of competing designs in state-financed and -leased facilities. The act states that OES's rule-making authority is for the purpose of assisting DAS in its responsibility for the state-funded facilities subject to DAS oversight and of cost-effectively reducing the energy consumption of those and any other state-funded facilities, thereby promoting fiscal, economic, and environmental benefits to the state. The Department of Development's Office of Energy Efficiency (OEE) must cooperate in providing information and technical expertise to OES to ensure promulgation of rules of maximum effectiveness.

The rules must specify cost-effective, energy efficiency and conservation standards that can govern the lease, design, construction, operation, and maintenance of all state-funded facilities except facilities of state institutions of higher education. The energy standards may draw from or incorporate, by reference or otherwise and in whole or in part, standards already developed or implemented by any competent public or private standards organization or program.

While preserving ongoing law's specifications for life-cycle cost and energy consumption analyses, as well as energy performance indices, the act also provides that the rules can include an application process by which a project manager, as to a specified state-funded facility, may apply for a waiver of compliance with the rules.

The rules further may include a requirement that, not later than two years after the act's effective date, each state-funded facility (except a higher ed facility) be managed by at least one building operator certified under the Building Operator Certification Program or any equivalent program or standards as must be prescribed in the rules and are considered reasonably equivalent.

The act adds an express requirement that each state agency, department, division, bureau, office, unit, board, commission, authority, quasi-governmental entity, institution, and state institution of higher education must comply with any applicable provision of state facility energy consumption law or of an OES rule promulgated under that law.

State purchasing

(R.C. 123.011(E))

Law changed in part by the act requires OES to promulgate rules to ensure the consideration of energy efficiency and conservation in state purchasing, using minimum standards based on federal testing and labeling where available or on standards developed by DAS. The act specifies that OES rules apply to the purchase of products and equipment, except motor vehicles, by any state agency, department, division, bureau, office, unit, board, commission, authority, quasi-governmental entity, or institution. It allows for minimum energy efficiency standards based on federal testing and labeling where available or on standards developed by OES. Two specific activities for which DOD's OEE must work cooperatively with OES are identifying available energy efficiency and conservation opportunities and providing technical assistance and training to state employees involved in purchasing. The act

eliminates a requirement that the DOD advise the OES on the state of the art of energy efficiency.

Fleet fuel economy standards

(R.C. 123.011(F) and (G))

Under ongoing law, OES authority to determine the requisite fleet average fuel economy of passenger automobiles acquired in a fiscal year extends to all agencies, departments, commissions, boards, authorities, quasi-governmental entities, state institutions, universities, and colleges. Under the act, OES fleet economy authority extends to state agencies, departments, divisions, bureaus, offices, units, commissions, boards, authorities, quasi-governmental entities, institutions, and state institutions of higher education. Also, the act provides that the OES rules prescribing the fuel economy standards be promulgated in accordance with fuel economy standards established pursuant to federal law, and eliminates a requirement that the rules be no less stringent than the federal standards. The act additionally makes technical drafting changes to OES fuel economy authority.

The act expressly requires that each state agency, department, division, bureau, office, unit, board, commission, authority, quasi-governmental entity, institution, and state institution of higher education comply with OES fleet fuel economy law.

OES staffing

(R.C. 123.011(B))

Law modified by the act requires that the DAS Director assign employees, equipment, and supplies to OES as the Director considers necessary for the *proper* performance of its duties. The act refers to the *performance* of OES's duties (dropping "proper").

Reimbursement to DAS

(R.C. 125.15)

Ongoing law requires all state agencies that must secure any equipment, materials, supplies, or services from DAS to reimburse DAS for them, including a sum for administrative costs. The act extends this reimbursement to include costs relating to energy efficiency and conservation programs.

State institutions of higher education

(R.C. 3345.69)

The act provides for the creation of an interuniversity committee to develop guidelines for university boards of trustees to use in ensuring energy efficiency and conservation in on- and off-campus buildings.

Committee composition

The act requires the chairperson of the Interuniversity Council of Ohio and the secretary of the Ohio Association of Community Colleges to assist in coordinating the organization and operation of a committee comprised of the presidents of the state institutions of higher education or their designees. "State institution of higher education" has the same meaning as in the facility construction/leasing law (see "***Scope of authority: definitions***," above).

Energy guidelines

The committee must develop the campus energy guidelines in consultation with OES. Initial guidelines must be adopted within 90 days of the act's effective date.

The act requires that the guidelines provide that each board of trustees develop its own 15-year plan for phasing-in energy efficiency and conservation projects. The guidelines must incorporate best practices into energy efficiency standards and plans and must provide that project impact assessments include the fiscal effects of energy efficiency and conservation recommendations and plans. And, they must establish mechanisms for each board to report periodically to the committee on its progress relative to the guidelines.

Further, the guidelines must include a goal of reducing on- and off-campus building energy consumption by at least 20% by 2014, using calendar year 2004 as the benchmark year. The act authorizes the guidelines to recognize the diverse nature and different energy demands and uses of such buildings, as well as measures already taken to increase building efficiency and conservation.

The guidelines also must prescribe minimum energy efficiency and conservation standards for any new, on- or off-campus capital improvement project with a construction cost of $100,000 or more. Those standards must be based on general building type and cost-effectiveness. Additionally, the guidelines must prescribe minimum standards for leased, off-campus spaces of at least 20,000 square feet.

Duty of a board of trustees

The act requires each board of trustees to adopt rules to carry out the campus energy guidelines, including carrying out the guidelines under the board's ongoing authority to enter into energy conservation contracts (R.C. 3345.62 to 3345.66, not in the act).

Advanced Energy Program

Generally, the act changes the Department of Development's Energy Efficiency Revolving Loan Program into the Advanced Energy Program and the Energy Efficiency Revolving Loan Fund into the Advanced Energy Fund and makes modifications to reflect these changes. The act provides that the Director of Development can use money in the Advanced Energy Fund for financial, technical, and related assistance for advanced energy projects or for economic development assistance.

Advanced energy project

(R.C. 4928.01(A)(25))

Former law provided for the Energy Efficiency Revolving Loan Program, which began on the starting date of competitive retail electric service (generally January 1, 2001). The Director of Development administered the program and could authorize the use of moneys in the Energy Efficiency Revolving Loan Fund for financial assistance for projects in Ohio. "Project" was defined as any real or personal property connected with all or part of an industrial, distribution, commercial, or research facility, not-for-profit facility, or residence that was to be acquired, constructed, reconstructed, enlarged, improved, furnished, or equipped with aid furnished pursuant to the Energy Efficiency Revolving Loan Program for the purposes of not-for-profit, industrial, commercial, distribution, residential, and research development in the state. "Project" could include any small-scale renewables project.

The act changes "project" to "advanced energy project" and defines it as technologies, products, activities, or management practices or strategies that facilitate the generation or use of electricity and that reduce or support the reduction of energy consumption or support the production of clean, renewable energy for industrial, distribution, commercial, institutional, governmental, research, not-for-profit, or residential energy users. The act specifies that such energy can include wind power; geothermal energy; solar thermal energy; and energy produced by micro turbines in distributed generation applications with high electric efficiencies, by combined heat and power applications, by fuel cells powered by hydrogen derived from wind, solar, biomass, hydroelectric, landfill gas, or geothermal sources, or by solar electric generation, landfill gas, or hydroelectric generation.

Program funding

(R.C. 122.075 and 4928.61)

Law retained in part by the act requires all energy efficiency revenues remitted to the Director of Development to be deposited into the Energy Efficiency Revolving Loan Fund for the Energy Efficiency Revolving Loan Program. Interest on the fund must be credited to it. Energy efficiency revenues are generated by the following:

(1) A temporary rider on retail electric distribution service rates (the rider cannot exceed $5 million per year after 2005 and ends ten years after the start of competitive retail electric service or when the fund reaches $100 million, whichever is first);

(2) Revenues from Energy Efficiency Revolving Loan Program loan repayments and payments from Program loan collections;

(3) Revenues collected by a participating municipal electric utility or electric cooperative.

Law modified by the act requires each electric distribution utility in Ohio to remit to the Director on a quarterly basis the revenues described above. These remittances began the first quarter following the starting date of competitive retail electric service. Each participating electric cooperative and participating municipal electric utility also must remit the revenues to the Director on a quarterly basis. These remittances must begin with the first quarter following the participating cooperative's or utility's decision to participate.

The act makes modifications to these provisions to refer to energy efficiency revenues as advanced energy revenues and to change the Energy Efficiency Revolving Loan Fund into the

Advanced Energy Fund. The act also adds as advanced energy revenue, interests earnings on the Advanced Energy Fund. The act does not change the temporary nature of the electric distribution service rate rider.

The act also modifies the remittance schedule to require payment of the revenues to the state within 30 days after the end of each calendar quarter for electric distribution utilities and participating electric cooperatives and municipal utilities. Additionally, the act expressly states that participation by an electric cooperative or municipal utility in the Energy Efficiency Revolving Loan Fund does not constitute a decision to participate in the Advanced Energy Fund.

Program assistance

(R.C. 4928.62(A))

Law that the act retains requires, to the extent feasible given approved applications for assistance, program assistance to be distributed among the certified territories of electric distribution utilities and participating electric cooperatives, and among the service areas of participating municipal electric utilities, in amounts proportionate to the remittances of each utility and cooperative to the Fund. Assistance can take the form of direct loans or grants, or loan participation agreements or linked deposits. Formerly, the Director could not authorize financial assistance under the Program unless the Director first determined all of the following:

(1) The project included an investment in products, technologies, or services, including energy efficiency for low-income housing, for residential, commercial and industrial business, local government, educational institution, nonprofit entity, or agricultural customers of an electric distribution utility or a participating municipal electric utility or electric cooperative.

(2) The project improved energy efficiency in a cost-efficient manner by using both the most appropriate national, federal, or other standards for products as determined by the Director, and the best practices for use of technology, products, or services in the context of the total facility or building.

(3) The project benefited the economic and environmental welfare of Ohio's citizens.

(4) The receipt of financial assistance was a major factor in the applicant's decision to proceed with or invest in the project.

The act removes these determination requirements and instead requires the Director to condition assistance on a determination that a project will create new jobs or preserve existing jobs in Ohio or use innovative technologies or materials. The act also eliminates a requirement that the total of grants provided in a fiscal year cannot exceed 10% of the revenues paid into the fund the previous fiscal year.

Director's authority

(R.C. 4928.57 and 4928.62(B))

In carrying out the Energy Efficiency Revolving Loan Program requirements, the Director could acquire property, make and enter into all necessary contracts and agreements, retain necessary employees or agents, adopt applicable rules, and do all things necessary for the operation of the program.

The act retains these provisions for the Advanced Energy Program, and specifies that the Director can award grants, contracts, loans, loan participation agreements, linked deposits, and energy production incentives to further the public interest in advanced energy projects and economic development. The act also permits the Director to hold ownership of any unclaimed energy efficiency and renewable energy emission allowances that result from advanced energy projects that receive funding from the Advanced Energy Fund.

Existing projects

(R.C. 4928.62(E))

The act further expresses that the changes regarding the Advanced Energy Fund do not affect any pending or effected assistance, purchases, or contracts in existence prior to the act's effective date under the Energy Efficiency Revolving Loan Program.

Geothermal systems for school districts

(R.C. 4928.62(F))

The act specifies that any assistance a school district receives for an advanced energy project, including a geothermal heating, ventilating, and air conditioning (HVAC) system, is to be in addition to any assistance provided under the Ohio School Facilities Commission Law and cannot be included as part of the district or state portion of the basic project cost under that Law.

Purposes of the program

(R.C. 4928.58, 4928.62(A), and 4928.63)

Law retained in part by the act provides that the powers and duties of the Director and the Public Benefits Advisory Board regarding the Energy Efficiency Revolving Loan Program exist in order to promote the welfare of the people of Ohio, to stabilize the economy, to assist in the improvement and development within Ohio of not-for-profit entity, industrial, commercial, distribution, residential, and research buildings and activities required for the people of Ohio, to improve the economic welfare of the people of Ohio, and to assist in the improvement of air, water, or thermal pollution control facilities and solid waste disposal facilities.

The act modifies these purposes with respect to the Advanced Energy Program to provide that the improvement in economic welfare is to occur by reducing energy costs and reducing energy usage in a cost-efficient manner using, as determined by the Director, both the most appropriate national, federal, or other standards for products and the best practices for the use of technology, products, or services in the context of a total facility or building. The

purpose concerning pollution is restated as assisting in the lowering of energy demand to reduce air, water, or thermal pollution.

The act provides that advanced energy and economic development assistance granted under the program is to be made in furtherance of these purposes.

Effective date of Advanced Energy Program provisions

(Section 10)

The act provides that the provisions relating to the newly created Advanced Energy Fund take effect immediately when the act becomes law.

State fleet fuel use requirements

(R.C. 125.834(C))

Under ongoing law, within 90 days after October 12, 2006, all motor vehicles owned or leased by the state that are capable of using an alternative fuel must use that fuel if it is reasonably available at a reasonable price. Subject to rules adopted by the Director of DAS, the motor vehicles must use at least 60,000 gallons of E85 blend fuel per calendar year by January 1, 2007, with an increase of 5,000 gallons per year each calendar year thereafter, and at least one million gallons of *biodiesel* per calendar year by that date, with increases of 100,000 gallons per calendar year each year thereafter. The act makes a change to require "blended biodiesel" usage under this schedule instead of "biodiesel." "Blended biodiesel" means a blend of biodiesel with petroleum based diesel fuel in which the resultant product contains not less than 20% biodiesel that meets the American Society for Testing and Materials specification for blended diesel fuel and any other standards that the Director of DAS adopts by rule.

Oil and natural gas marketing program

(R.C. 1510.04)

Continuing law establishes procedures by which independent producers of oil or natural gas may present a petition to the Division of Mineral Resources Management Technical Advisory Council in the Department of Natural Resources to hold a referendum to establish a marketing program for oil and natural gas or to amend an existing program. At the time of the presentation of the petition, the petitioners also must propose a rate of assessment to be made on the production of oil and natural gas in Ohio to fund the program. Formerly, the rate could not exceed 1¢ per gross barrel of oil and 1/10¢ per thousand cubic feet of natural gas. The act increases the limit on the rate of assessment by providing that it cannot exceed 5¢ per gross barrel of oil and 1¢ per thousand cubic feet of natural gas.

Natural gas pipeline safety standards

(R.C. 4905.90)

For the purposes of the natural gas pipeline safety standards law, the act modifies the definition of "gas" to which the law applies. Under prior law, "gas" meant (1) natural gas,

synthetic natural gas, or a mixture of those gases, and (2) petroleum gas when used in the transmission or distribution system of a natural gas or gas company. The act changes the definition of gas to make it consistent with federal law. Under the act, "gas" means natural gas, flammable gas, or gas which is toxic or corrosive.

LEED for Schools

(Section 9)

The U.S. Green Building Council (USGBC) is a nonprofit organization consisting of more than 6,900 building industry organizations that develop the Leadership in Energy and Environmental Design (LEED) Green Building Rating System. LEED is a voluntary, consensus-based national rating system for developing high-performance, sustainable buildings. The "LEED for Schools" Rating System, expected in February 2007, addresses issues specific to schools such as classroom acoustics, master planning, and mold prevention.

The act requires the Ohio School Facilities Commission to study the USGBC's "LEED for Schools" Rating System and to issue a written report to the General Assembly by October 1, 2007, comparing that system to applicable standards set forth in the Commission's most current Ohio School Design Manual.

HISTORY

ACTION	DATE
Introduced	05-10-05
Reported, H. Public Utilities & Energy	12-15-05
Passed House (92-1)	01-17-06
Reported, S. Energy & Public Utilities	12-13-06
Passed Senate (32-0)	12-13-06
House concurred in Senate amendments (95-0)	12-14-06

06-hb251-126.doc/jc

* The Legislative Service Commission had not received formal notification of the effective date at the time this analysis was prepared. Additionally, the analysis may not reflect action taken by the Governor. Also, the analysis does not address appropriations, fund transfers, and similar provisions. See the Legislative Service Commission's Fiscal Note for H.B. 251 for an analysis of such provisions.

As identified under exemptions provided in continuing R.C. 123.01(B) and (C), such agencies are the Adjutant General regarding certain military property and armories; the Department of Transportation regarding buildings for administration of the department; the Department of Public Safety regarding deputy registrar facilities or division or district offices; the State Highway Patrol regarding Patrol facilities; the Division of Liquor Control regarding retail outlets and warehouses; the Department of Development regarding the state's foreign offices; buildings under the Capitol Square Review and Advisory Board, the Rehabilitation Services Commission, the Bureau of Workers' Compensation, and the Departments of Job and

Family Services, Mental Health, Mental Retardation and Developmental Disabilities, and Rehabilitation and Correction; and buildings of educational and benevolent institutions under the management and control of boards of trustees.

The act's removal of former law's definition of "life-cycle costs" is not significant: it is removed in favor of incorporating the gist of the definition into the operative text of the statute.

On its web site, Building Operator Certification is described as "a nationally recognized professional certification for facilities operations and maintenance staff" that is "competency-based." See http://www.theboc.info/sponsors.html.

The rules must be adopted under R.C. 111.15.

The Public Benefits Advisory Board advised the Director on the administration of the Energy Efficiency Revolving Loan Program, and its duties are continued with respect to the Advanced Energy Program. The Board consists of 21 members including members from state agencies, members of the House of Representatives and Senate, and members appointed by the Governor representing various interested parties and consumers.

As a result of the change in the definition of gas, the act also removes the definition of "synthetic natural gas" in the natural gas pipeline safety standards law.

Appendix C

DPS Policy 301.08 Energy Conservation and Audit

Ohio Department of Public Safety

Policy Number : DPS-301.08

ENERGY CONSERVATION AND AUDIT

Date of Revision : **2/5/2008**

Priority Review : **All Employees**

Distribution : **All DPS Offices**

Summary of Revisions

New Policy

Purpose

To improve energy consumption efficiency, reduce costs, optimize capital investment for energy efficiency, reduce environmental and greenhouse gas emissions, and conserve natural resources.

Policy

A. **STATEMENT OF POLICY** - The Ohio Department of Public Safety (DPS) will promote the efficient use of energy while maintaining services to the citizens of the State of Ohio. The provisions contained herein apply to all DPS operations. We will:

- Improve energy efficiency continuously by establishing and implementing effective energy management programs throughout the Department of Public Safety while providing a safe and comfortable work environment.
- Emphasize energy efficiency, and green building as a factor in facility design.
- Enroll in energy saving programs and secure adequate and reliable energy supplies at the most advantageous rates and implement contingency plans to protect operations from energy supply interruptions.
- Encourage continuous energy conservation by employees in their work and personal activities.
- Continuously review further development of internal and external energy efficient and innovative technologies and apply them where it is applicable and fiscally sound.
- Cooperate with other governmental agencies and utility companies on energy

programs.

- Support national and state energy efficiency policies.
- Reduce vehicle fleet petroleum consumption through policies, practices, adoption of technologies, and utilization of alternative fuels.

B. **ODPS AIR CONDITIONING POLICY**

1. During the normal working day, all air-conditioned offices will be cooled to between 74°- 78°F.
2. During the evening and on weekends and holidays, the temperature will be allowed to rise except those facilities that are open 24 hours a day, 7 days a week.
3. All posts will monitor special purpose spaces and facilities to determine if modifications to the policy are warranted.
4. Supervisors are encouraged to accommodate reasonable requests from employees to wear more casual clothing because of the increased temperature

C. **ODPS HEATING POLICY**

1. Offices will be heated to 68°F while offices are open. For off-hours, weekends and holidays (if applicable) the temperature will be allowed to drop to 55°F.
2. Heating will be provided on weekends and off-hours as needed.
3. All facilities and posts will utilize the most energy-efficient means of supplying heat.

D. **ENERGY CONSERVATION INSPECTION, MAINTENANCE AND AUDIT**

1. **Periodic Energy Audit** – Semi-annually in May and again in October, the facility manager or designee and a maintenance worker at each DPS facility will conduct an energy audit to ensure that heating and cooling equipment is used efficiently.
2. **Inspection and Maintenance of Heating / Air Conditioning Systems (HVAC)** - The facility manager will ensure that the contract HVAC vendors perform the following services during the semi-annual and annual inspections:
    - Check motors for proper lubrication. Check amp draws on HVAC motors semi-annually during the service call.
    - Check semi-annually and maintain ducts clean and free of obstructions.
    - Maintain all filters clean and properly installed. Change HVAC filters quarterly. A maintenance repair worker shall inspect and change HVAC filters during the summer and winter quarter, between HVAC vendor inspections.
    - Check HVAC belts for proper tension and wear annually.
    - Check HVAC coils annually for cleanliness and corrosion. Clean as needed.
    - Inspect HVAC heat exchanger annually.
3. **Record Keeping** - The facility manager will use the energy conservation audit inspection sheet as a guide for the inspection. Complete the form during the inspection, forward a copy to district headquarters for review, and file a copy in a subfolder in the post / office facility file. Retain for two years and then destroy.

4. **Corrective Action** - The facility manager is responsible for initiating corrective action to repair any deficiencies.

Current Form and Supplemental References

Checklist available by accessing the Central Repository System (CRS):
http://odpsweb.ps/crs/WebPages/Repository/MyDocuments.aspx

- **DPS XXXX Energy Audit Checklist.doc**

Standard References

None

Policy References

DPS-300.01	PURCHASE, ALLOCATION, AND SALVAGE OF PATROL CARS AND ALL DPS-OWNED SUPPORT VEHICLES
DPS-301.06	LEASED FACILITY PROJECT MANAGEMENT
DPS-302.02	OCCUPATIONAL SAFETY EQUIPMENT
DPS-303.01	INVENTORY MANAGEMENT SERVICES
DPS-500.12	ADMINISTRATION OF PURCHASING FUNCTIONS
DPS-505.01	EMPLOYEE WORK AREAS
DPS-505.10	FACILITY INSPECTIONS BY EPA, OSHA, AND FIRE MARSHAL
DPS-507.04	CONTRACTUAL AGREEMENTS - FACILITY - FLEET - EQUIPMENT - SERVICES
OSP-201.15	PLATFORM SCALE FACILITY OPERATIONS
OSP-203.28	IDENTIFYING AND REPORTING EMERGENCY AND HAZARDOUS CONDITIONS
OSP-301.02	OPERATION AND MAINTENANCE OF AUXILIARY POWER GENERATORS
OSP-301.06	FACILITY REPAIR, MAINTENANCE, AND CAPITAL PROJECTS

Attachment(s)

DPS-301.08 Ways to Save Energy.doc

DPS-301.08 Energy Audit Checklist.doc

Appendix D

DPS Policy 301.08 Energy Conservation and Audit Checklist

OHIO DEPARTMENT OF PUBLIC SAFETY
EDUCATION · SERVICE · PROTECTION

ENERGY AUDIT CHECKLIST

Building _____ Date _____
Inspected by _____

Pre-Audit Data

Review energy usage from utility bills . What is trend, why? _____

_____

_____

Building operating hours from _____ to _____
List major energy consuming equipment / functions in your building? _____

_____

_____

Heating	Age or year mfg. _____	Efficiency rating _____	TYPE (gas, elect., heat pump, etc.) _____
Air Conditioner	Age or year mfg. _____	Efficiency rating _____	TYPE (gas, elect., heat pump, etc.) _____
Hot Water Tank	Number of Gallons _____	Temp Setting _____	TYPE _____

AUDIT

OFFICE EQUIPMENT

It	Check Point Description	Y	N	N	Comments
1.	Are PC monitors and computers shut off or on sleep mode at the end of the work day?	☐	☐	☐	
2.	Are copying machines shut off or on sleep mode at the end of the work day?	☐	☐	☐	
3.	Are fax machines shut off or on sleep mode at the end of the work day?	☐	☐	☐	
4.	Is equipment unplugged that drains energy when not in use (i.e. cell phone chargers, fans, coffee makers, desktop printers, radios etc.)?	☐	☐	☐	
5.		☐	☐	☐	

• LIGHTING

• Item	• Check Point Description	• Yes	• No	• N/A	• Comments		
6.	• Areas to change incandescent lights to fluorescent lights	• ☐	• ☐	• ☐	• Location	Type	Qty
7.	• Exit signs, upgrade to LED type (signs made up group of small lights like PC or phone lights)	• ☐	• ☐	• ☐	• Location		Qty
8.	• Would you like to install local switches for more control for very large area & lights?	• ☐	• ☐	• ☐	• Location		
9.	• Delamp / deactivate extra lights & fixtures	• ☐	• ☐	• ☐	• Location		Qty
10.	• Is lighting only used when needed or natural lighting when feasible? Turn off lights near windows.	• ☐	• ☐	• ☐	•		
11.	• Is lighting on after hours & weekend used only when needed?	• ☐	• ☐	• ☐	•		
12.	• What percentage of lights is being shut off during, after hours/weekends?	• ☐	• ☐	• ☐	•		
13.	• Outside lights (outside building & entry) acceptable? Change to compact fluorescent?	• ☐	• ☐	• ☐	• Location	Type	Qty
14.	• Special Lighting needs / concerns where?	• ☐	• ☐	• ☐	•		
15.	• What do you hear most often regarding lights in this building?	• ☐	• ☐	• ☐	•		
16.	• Do you need additional light switch stickers to remind people to turn off lights when not in use?	• ☐	• ☐	• ☐	• Location		Qty
17.	• Is Task lighting being utilized where possible?	• ☐	• ☐	• ☐	•		

18.

- Is there a maintenance schedule to routinely clean lights and lighting features? How often is this being accomplished ?

- ☐
- ☐
- ☐
-

• HEATING AND COOLING

• Item	• Check Point Description	• Yes	• No	• N/A		• Comments
19.	• If heating / cooling control is accomplished from programmable thermostats, does the thermostat schedule match your occupancy?	• ☐	• ☐	• ☐	•	
20.	• Are heating thermostats set to maintain 68°F or lower?	• ☐	• ☐	• ☐	•	
21.	• Is air conditioning (A/C) set for 74°F-78°F and shut down during unoccupied hours?	• ☐	• ☐	• ☐	•	
22.	• Are there many fans or portable electric space heaters used by occupants?	• ☐	• ☐	• ☐	• Location	Type
23.	• Is the garage heater set on lowest possible setting after normal business hours?	• ☐	• ☐	• ☐	• Location	
24.	• Are restroom exhaust fans shut off during unoccupied hours? Other building exhaust fans?	• ☐	• ☐	• ☐	•	
25.	• What do you hear most often regarding this building heating/cooling & comfort?	• ☐	• ☐	• ☐	•	
26.	• Do you have very large (>1HP) fans or motors operating in this building?	• ☐	• ☐	• ☐	•	
27.	• Has thermostat been calibrated?	• ☐	• ☐	• ☐	•	
28.	•	• ☐	• ☐	• ☐	•	
29.	•	• ☐	• ☐	• ☐	•	

30. • • □ • □ • □ •

• BUILDING ENVELOPE

• Item	• Check Point Description	• Yes	• No	• N/A	• Comments
31.	• Are doors/windows kept closed during heating and cooling season?	• ☐	• ☐	• ☐	•
32.	• Is weather stripping found to be adequate around windows, doors, conduits, piping, exterior joints?	• ☐	• ☐	• ☐	•
33.	• Are windows in need of solar film to reduce/block the sun.	• ☐	• ☐	• ☐	•
34.	• Building walls too hot/cold candidate for insulation	• ☐	• ☐	• ☐	• Location
35.	• Are the gaskets and or stripping on the garage and overheads doors adequate?	• ☐	• ☐	• ☐	•
36.	• Are interior shading devises closed at night to reduce heat loss in winter and to reduce solar gain in the summer?	• ☐	• ☐	• ☐	•
37.	• **Pitched roof**- inspect for loose, damaged, missing or curled shingles, tiles, or metal panels. • **Flat roof** – check for cracks, bubbles, separation of roofing material, and puddling of water.	• ☐	• ☐	• ☐	•
38.	• **Roof Drains** - is there proper drainage? Remove debris from around drains.	• ☐	• ☐	• ☐	•
39.	•	• ☐	• ☐	• ☐	•
40.	•	• ☐	• ☐	• ☐	•

41. • • □ • □ • □ •

42. • • □ • □ • □ •

• WATER

• Item	• Check Point Description	• Yes	• No	• N/A		• Comments
43.	• Is domestic hot water at lowest possible setting (110°F) for general purpose?	• ☐	• ☐	• ☐	•	
44.	• Are there any leaking faucets?	• ☐	• ☐	• ☐	• Location -	
45.	• All sinks use low flow faucets? (~2.0 gpm)	• ☐	• ☐	• ☐	•	
46.	• Is hot water piping insulated where needed?(pipes are warm/hot to touch)	• ☐	• ☐	• ☐	•	

• MISCELLANEOUS

• Item	• Check Point Description	• Yes	• No	• N/A		• Comments
47.	• Do you review your utility usage and bills for your building?	• ☐	• ☐	• ☐	•	
48.	• Are energy awareness materials displayed throughout the building?	• ☐	• ☐	• ☐	•	
49.	• Is there other major energy usage, issues in your building not covered in this audit?	• ☐	• ☐	• ☐	•	
50.	• Are PC monitors, copying machines, being shut off or put on sleep mode at the end of the work day?	• ☐	• ☐	• ☐	•	
51.	• Would you like additional energy conservation educational materials (Posters, Usage data, Light stickers) within your building?	• ☐	• ☐	• ☐	•	
52.	•	• ☐	• ☐	• ☐	•	

53. • • □ • □ • □ •

54. • • □ • □ • □ •

• SUMMARY AND ACTION ITEMS

•	• ISSUE	• ACTION / REQUESTED From Facility Management (Use this sheet to tell us what you want help with from us or needs further attention from Facility Management.
• Lighting	•	•
• Heating / Cooling	•	•
• Building Envelope	•	•
• Water	•	•
• Office Equipment	•	•
• Misc.	•	•

Appendix E

Ohio Department of Public Safety

Ways to Save Energy

A. HEATING / AIR CONDITIONING SYSTEMS

Heating and cooling typically accounts for up to 30 per cent of businesses energy bills. While significant savings can be made when constructing a new building through clever design and installation of efficient equipment there are many simple steps that can be taken to create savings from existing systems.

HVAC Fundamentals:

- Reduce heating or cooling of unoccupied spaces.
- Reduce heat gain in summer and heat loss in winter.
- Regularly maintain equipment.
- Automate HVAC where possible
- Calibrate the termostat

Simple no cost changes:

- **Turn heating and cooling off.** Leaving HVAC on for 24 hours a day can double your costs. Make it someone's responsibility to check that all heating and cooling is turned off at the end of the day, especially on weekends or install a timer which will turn off your system outside of business hours.
- **Keep doors and windows closed.** An open door can waste up to 50 per cent of HVAC energy costs. Make sure external doors are closed as well as any internal doors that can isolate rarely used areas. Ensure that doors and windows have tight seals and remain closed when possible.
- **Turn off equipment.** Powered equipment and lighting produce heat. Turning of equipment that is not in use can substantially reduce cooling requirements.
- **Adjust thermostats.** Make sure thermostats are set appropriately. Winter temperatures should be 68°F while in summer a temperature of 74-78° F should be comfortable. Areas that are used infrequently such as storerooms and toilets can be set at 60°F in winter, which can decrease heating costs for these areas by about 30 per cent. Encouraging staff to dress appropriately for the season also assists.
- **Allow airflow.** If using a ducted HVAC system ensure furniture, drapes and other items are clear of the vents or outlets to ensure free airflow.

Low Cost Options:

- **Maintenance -** HVAC systems, whether a fully programmable ducted system or a portable fan heater requires regular maintenance. Maintenance should include ensuring that equipment is dust free, cleaning burners and air conditioner coils, replacing and cleaning air filters and checking ducts and pipe insulation for leaks or damage. A well maintained system costs less to run and provides better performance. It is a good idea

to perform a pre-season check prior to the winter heating and summer cooling periods to ensure that your system will function efficiently when required.

- **Install thermostats.** Programmable thermostats can be installed to control temperatures automatically. Thermostats should be installed in the main work area away from heat sources and draughts. Ensure that thermostat controls can be overridden for holidays and long weekends so that you can turn off the heaters and coolers over these periods. Place locking covers over thermostats to prevent staff unnecessarily altering any settings.
- **Fit air deflectors.** Air deflectors fitted to floor outlets of ducted systems will force the air into the centre of the room, providing better temperature control.
- **Fit automatic door closers.** Automatic door closers fitted to external or internal doors will reduce draughts and decrease space needed to be heated or cooled, making HVAC systems more efficient.
- **Use portable heaters and coolers.** In some circumstances use of a portable heater is more cost effective than a central system. Small electric fan heaters, column or radiant heaters, portable coolers or fans may be more appropriate when there is a small number of employees working in a large area.

B. LIGHTING

Making changes to the way we light our office is a good place for us to begin reducing greenhouse gas emissions. Lighting changes are generally easy to make, low cost and can reduce energy costs by up to 40 per cent.

Lighting Fundamentals:

- Turn lights off when not in use.
- Take advantage of natural light.
- Reduce the number of lights.
- Ensure lighting system is properly maintained.
- Install energy efficient lighting technology.
- Use lighting control systems

<u>Simple No Cost Changes</u>

- **Use natural light.** Natural light is free. Ensure that window areas are clear so as not to block out light. Arrange work areas and desks so they are close to windows. Educate employees to use natural light when possible.
- **Switch lights off.** Lights should be turned off in unoccupied areas. Turn off lights in storerooms, meeting rooms, kitchens and bathrooms that may be unnecessarily lit. Labelling switches can assist staff to identify areas in which unnecessary lighting can be turned off. Remind staff to switch off lights when going out to a meeting or to lunch. Check that external lighting is not on during daylight hours.
  Task lighting. The use of overhead lighting can be reduced if extra light is focused directly on the area where it is required-saving your business energy and money.
- **Reduce unnecessary lighting.** Often areas such as hallways and corridors are over lit. Experiment to see if removing lamps will still light work areas to staff satisfaction. For example, two lamps in a four-lamp fixture might provide enough light and avoid over lighting the area. Use of lower light or indirect lighting to avoid or reduce glare on computer monitors may be appropriate.

Low Cost Options:

- **Establish a maintenance schedule.** Lamps and coverings need to be kept clean for a lighting system to operate at its optimum level. Dirt and dust build-up can reduce light output by up to 50 per cent and can also decrease the life expectancy of fixtures and lamps, increasing costs.
- **Choose the right lamp.** Using energy efficient lamps can lead to significant cost savings in relatively short periods. Replace incandescent light bulbs with compact fluorescent lamps (CFLs). For fluorescent lighting, use the more efficient triphosphor fluorescent tubes rather than conventional fluorescent tubes. Sodium lamps or metal halide lamps are an efficient lighting option for exterior lighting or in factories and warehouses with high ceilings. While generally more efficient lamps are more expensive than conventional lamps, they use less energy, last longer and provide higher quality illumination. Do not wait until old lamps wear out to replace them with more energy efficient lighting, as savings from the use of these will generally outweigh any initial investment.
- **Exit signs.** Replace incandescent exit lighting with light emitting diode (LED) lamps. LED models use approximately 70 per cent less energy than conventional units and can provide significant energy and cost savings.
- **Redecorate.** Choosing lighter colours for wall surfaces will reflect light, reducing your lighting needs. Simply keeping wall surfaces free of dirt will also improve illumination. In a partitioned office, consider lowering partition height as taller partitions may block effective lighting.
- **Reflectors.** Silver or aluminium reflectors fitted behind lamps can improve efficiency by up to 40 per cent.
  Ballasts. Typically up to 20 per cent of the total energy used in fluorescent systems is lost in heat from the ballast. By installing low loss ballasts for fluorescent lighting substantial savings can be made in energy costs.
- **Timers.** Timer devices can be installed to switch lights off after a certain amount of time or at a certain time of day. Various models are available and many models incorporate manual override functions for situations where light is required for an extended period.
- **Sensors.** Occupancy sensors detect movement and turn lights on when someone enters the space, so lights are only on when the space is being used. They are particularly effective in bathrooms, external areas and low use locations such as storerooms and meeting rooms. Another approach is to use light sensors that detect the level of natural daylight and switch lighting on and off according to preset light levels, so lights are only used when there is insufficient natural light.
- **Rewiring.** Instead of using central light switches to turn all lights on in your premises rewire these to switch on background lighting only. The installation of switches for localised lights will then allow lights to be switched on when required. Areas with access to natural light should be rewired to switch on and off independently from areas without natural light, enabling some lights to be turned off during the day.

C. OFFICE EQUIPMENT

The modern business is heavily reliant on the use of a wide range of office equipment; hence the use of such equipment significantly contributes to the total amount greenhouse gas emissions from most businesses. You can reduce the greenhouse gas emissions from the use of office equipment through both purchasing energy efficient equipment and by making many basic changes to the way you use the equipment

Office equipment Fundamentals:

- Turn all equipment off when not in use.
- Purchase energy efficient equipment.
- Organize work so that electronic equipment is running for shorter periods

Simple No Cost Changes

- **Turn equipment off.** All equipment should be turned off when it willnot be used for at least 30 mins. Remember to check the appliance is really off and not just in sleep mode.

  If possible equipment should be turned off at the power point. Modern technology is designed in such a way that many appliances still draw power while waiting to be activated. If power points are difficult to reach you may want to consider using power boards with individual switches or simple plug-in timer controls which can automatically switch appliances off or on as required during normal business hours.

  Equipment should be turned off when not in use during the day. Encourage employees to turn off equipment if they are going to a meeting or having lunch. If something is not in use for 30 minutes it should be turned off. Also remember to turn off things like coffee machines, desk lamps, rechargers, transformers and scanners.

  If your PC acts as a network server and needs to be left on, remember to switch its monitor off.
- **Activate 'sleep' mode on equipment.** Most modern office equipment has a sleep or standby feature. If you are unable to turn off the piece of equipment, activate its 'sleep' mode as this can save between 1-10 per cent of energy usage.
- **Work smarter.** Can you better organize work so that electronic equipment is running for shorter periods? For example, can photocopying be done in a single run each day allowing the copier to be turned off at all other times

D. HOT WATER

To reduce energy consumed by heating water and in turn the resulting greenhouse gases emitted while heating the water, we will need to use less water, improve the efficiency of our current hot water system or install a more efficient hot water system.

Hot Water Fundamentals

- Reduce water use.
- Reduce water temperature.
- Insulate the tank, pipe work and fittings.
- Install flow restrictors.
- Consider solar or gas hot water systems over conventional electricity hot water systems, for replacement where appropriate.
- Regularly maintain your hot water system.
- Consider instantaneous or tankless water systems.

Simple No Cost Changes:

- **Reduce thermostat setting.** The temperature on many water heaters is set at an unnecessarily high level. Check that the thermostat is set at a level that is appropriate for the purpose of use of the hot water. Always comply with local by-laws and

regulations that determine minimum temperatures for hot water systems depending on the end use of the water. For example, for staff domestic use of water, always ensure that the temperature gauge on storage hot water systems is set at no higher than 110°F. A higher temperature than this means that energy is used unnecessarily and a lower temperature than this may allow harmful bacteria to thrive. Instantaneous hot water systems should be set to no more than 110°F.

- **Turn water heater off.** Some businesses do not need to use hot water outside of business hours. By turning off your hot water system at night and on weekends you prevent unnecessary water heating and save money on the associated energy costs. To simplify this process, you can add a timer to electric water heating units to automatically turn the system on and off depending on when hot water is required. For example, you may want to consider setting the hot water system to turn on an hour before you start businesss for the day and turn off before close of business.
- **Switch off pumps.** If you use a circulating pump, make sure to also turn this off outside of business hours.

Low Cost Options:

- **Insulate hot water tank.** To reduce heat loss in your hot water system, make sure that your hot water storage tank is insulated and sheltered from the weather.
  Insulate pipes. Ensure that hot water pipes are insulated. The pipes should have a insulating covering at least 10mm thick with hot pipes enclosed for at least two feetand cold water pipes insulated at least one foot from the water heater.
- **Install flow restrictors.** By installing flow restrictors or aerators in taps, or purchasing water efficient taps, you can make significant savings on your water bill as well as save up to 60 per cent on heating costs when compared to using conventional taps.
- **Check for leaks.** Even the smallest leak will cost us money. Ensure the entire hot water system is checked regularly and that leaks are repaired immediately.
- **Regular maintenance.** Hot water systems like all other equipment in our business require regular maintenance to continue operating efficiently. Water heaters with storage tanks should be flushed out annually to remove sediment. Doing this is usually as simple as opening the drain valve at the bottom of the tank and drawing off water until the water runs clear. (See manufacturer's instructions.) The burners of gas water heaters should be cleaned and tested periodically to make sure that the fuel is being burned as efficiently as possible.
- **Install low flow showerheads.** Whether you provide showers for staff or as part of your business, changing to low flow showerheads is a simple way to reduce our water bills, energy costs and greenhouse gas emissions.

E. MAINTENANCE

Implementing a regular and thorough maintenance program can result in savings in energy costs as well as a reduction in greenhouse gas emissions. We can make up 5 to 20 per cent savings on our energy costs by carrying out regular maintenance on our equipment to make sure it is operating at optimum capacity. Some basic maintenance tasks may not have to be contracted out to maintenance professionals but could be completed by employees with a good working knowledge of how our business equipment functions. For example, basic maintenance activities such as checking that automated timers on equipment are clean and activated, which can be conducted by staff members, can produce significant energy and cost savings.

Maintenance Plans

- **Design and implement a maintenance plan.** While the initial set up of your maintenance plan may take time, the benefits and savings it provides will more than compensate for any initial investment. A preventative maintenance plan can ensure that maintenance occurs before a problem with equipment arises. This will increase the reliability and life span of equipment and reduce business down time due to breakdowns. It will also reduce operational costs and greenhouse gas emissions associated with running inefficient equipment.

  A maintenance plan should include a description of how to check if equipment is operating efficiently, a list of all the required maintenance tasks and a schedule of when maintenance should be conducted. Conducting a walk-through energy audit of your facility will assist you to develop this list. The maintenance plan should incorporate a periodical review of operating sequences, strategies and schedules. That way changes in the operation of our business can be accounted for in the maintenance of our equipment.

  Your plan should include monitoring heating, ventilation and air conditioning (HVAC) systems as well as lighting schedules. All maintenance performed should be tracked and recorded to ensure that all necessary maintenance tasks are completed according to schedule and to set standards.

- **Train Personnel.** Promote the connection that maintenance can have between saving energy and business costs. Ensure that you train your employees to identify signs that equipment may need maintenance and encourage reporting of any instances of equipment malfunction. Encourage personnel to get into the habit of turning off lights and equipment that are not required, as running equipment efficiently will save money and greenhouse gas emissions and also help to increase the life of the equipment.
- **Engage HVAC contractors.** Utilize HVAC contractor to perform specific tasks such as tuning your heating, ventilation and air conditioning system. Professional maintenance contractors will be able to assist you in identifying ways to improve the energy efficiency and greenhouse performance of your operation to reduce those unwanted costs associated with equipment breakdowns.

Maintenance Tasks

Following is a list of simple maintenance tasks that will help you reduce your energy consumption and greenhouse gas emissions. It is however by no means an exhaustive list and you should conduct an energy audit of your building to determine your individual requirements.

- **Lighting.** Clean lights weekly, dust lamps and clean fixtures thoroughly whenever lamps are replaced.
- **Automatic controls.** Optimise your thermostat settings and make sure the automatic controls on equipment are functional and adjusted to take into account the change in season, daylight savings and operating hours. This will help to avoid running equipment when it is not required. Take time to learn the full capabilities of your automatic controls - they may have more complex functionality and programming options which will allow you to achieve increased energy savings for our business.
- **Hot water systems.** Follow your manufacturer's instructions on how to clean your hot water system or hire a professional to clean it for you. Clean and test the burners of gas water heaters periodically and clean storage tanks annually to remove sediments.

- **Heating, ventilation and air conditioning (HVAC) systems.** All HVAC systems should be cleaned regularly according to the manufacturer's cleaning instructions. Perform a pre-season check prior to the winter heating and summer cooling periods. Clean burners and air conditioner coils and clean or replace air filters. Clean and adjust blower components as this can increase the energy efficiency of your HVAC system by up to 15 per cent. Check the refrigerant level of your central air conditioner and adjust it if necessary. Check ducts and pipe insulation for leaks and repair any damage as soon as possible.

Water leaks. Regularly check your water meter to detect changes in your water usage pattern. A sharp increase in water use could indicate a leak in your water system that should immediately be rectified to prevent continued water waste. To detect less obvious leaks, turn off every water-using device in your ofice and check your water meter. If your water meter is still ticking over it could indicate that you have a leak in your water system that will need to be fixed. Always employ qualified plumbers to conduct any maintenance work on your water system, as this will reduce the risk of accidental damage to the s

Appendix F

Internet Resources

Federal Energy and Environmental Program WebPages

http://www.energy.gov/

U. S. Department of Energy, Governmental department whose mission is to advance energy technology and promote related innovation in the United States.

http://www.eia.doe.gov/

Energy Information Administration, US Department of Energy (DOE) providing statistics, data, analysis on resources, supply, production, consumption for all energy sources.

http://www.fueleconomy.gov/

US Department of Energy –Fuel Economy-Gas Mileage, safety, air pollution and greenhouse gas emissions for new and used cars and trucks.

http://www1.eere.energy.gov/biomass/

US Department of Energy Biomass Program-Develops technology for conversion of biomass to fuels, chemicals, materials, and power. Includes general information about biofuels, program research.

http://www.epa.gov/

The Environmental Protection Agency (EPA or sometimes USEPA) is an agency of the US Federal Government charged with protecting human health and with safeguarding the natural environment air, water, and land.

http://www.energystar.gov/

Created by the US Environmental Protection Agency and the US Department of Energy to help consumers save money and prevent air pollution.

http://www.epa.gov/climatechange/

EPA's Climate Change Site offers comprehensive information on the issue of climate change in a way that is accessible and meaningful to all parts of society – communities, individuals, business, states and localities, and governments.

http://www.eere.energy.gov/buildings/highperformance/zero_energy_buildings.html

The US DOE supports the development of commercial buildings that are energy efficient, green technology schools, net zero.

State Energy and Environmental Program Web Pages

http://www.odod.ohio.gov/cdd/oee/

The Ohio Energy Office (OEO) works with individuals, communities, non-profit organizations, businesses large and small, industry, and other government agencies to achieve its VISION: a robust economy supported by multiple energy sources, energy efficiency, and advanced technology with added value for the quality of life for all Ohioans.

http://www.epa.state.oh.us/dir/climatechange.html

Ohio EPA web site that discusses climate change in Ohio and provides links to Climate Change Basics, Addressing Climate Change - Ohio's Role, Regional, National and International Information, Publications and Resources What You Can Do, Renewable Energy in Ohio, Carbon Sequestration, Climate Change Central.

College and University Energy and Environmental Program WebPages

http://www.tufts.edu/tie/

Tufts University Institute for the environment demonstrates examples of recycling, green roofs, climate change, etc. One of the first to start the greening of college and university campuses.

http://www.oberlin.edu/sustainability/

Oberlin College's environmental accomplishments include its food service where a third of the food served in its dining halls is produced locally; the school hosts the first car-sharing program in Ohio. Recognized nationally as a leader in energy conservation and recycling. A great site to visit.

http://www.greencampus.harvard.edu/

Harvard University is not only a respected academic preeminence in education but is also known for its campus wide environmental sustainability programs. Check out their commitment to Green building.

http://www.colorado.edu/

The University of Colorado offers multiple energy conservation and green environmental programs. Moe Tabrizi, Energy Conservation Officer, is a great resource and allowed us to modify the audit sheet to use for smaller buildings.

http://www.washington.edu/admin/facserv/conserve.php

University of Washington web site provides information on sustainability, links to their energy conservation efforts and reducing their carbon footprint.