WASHINGTON STATE UNIVERSITY
EXTENSION ENERGY PROGRAM

Energy Assessment Report

Tumwater City Hall

Tumwater, Washington

Preliminary Energy Efficiency Assessment

Performed for the Washington Dept. of General Administration's Plant Operation Support Consortium

AUGUST 2008

WSUEEP-08-018

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Prepared by:

WASHINGTON STATE UNIVERSITY
EXTENSION ENERGY PROGRAM

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The authors wish to thank the U.S. Department of Energy's Building Technologies Program for their funding of the Northwest Building Efficiency Center (NBEC), the program through which this assessment was performed. NBEC delivers information on energy efficient technologies to builders, code officials and public building managers so they can significantly reduce building energy use in the region, striving to deliver the right information at the right time, in the best manner, to the people who can implement successful energy efficiency projects. For more information on NBEC, link to www.nwbuildings.org.

Disclaimer

Executive Summary

The purpose of this study was to provide a baseline assessment of energy efficiency improvement opportunities at the Tumwater City Hall. A baseline assessment utilizes information obtained during a brief period of observation to characterize the existing equipment and operation for the purpose of evaluating opportunities for saving energy and other resources. Data was collected for this assessment during a one-day visit to the site on July 24, 2008.

The City has committed to climate change mitigation through the reduction of greenhouse gas emissions to 7% below year 2000 levels. In the City's Climate Change Action Plan notes that building energy use represents the second greatest source of greenhouse emissions in the City. However, despite an energy conservation program started in 2003, the city's building energy use has increased annually since then other than a slight dip between 2005 and 2006. It seems that a more aggressive commitment to facility energy savings will be needed to achieve the City's stated goals.

Key Observations and Opportunities for Improvement:

- Most of the lighting on the main floor is still T-12 fluorescent; these should be group relamped with T-8 lamps and electronic ballasts
- The Council Chambers are mostly unused and thus unconditioned, but often not closed off from the foyer; the door to this area should be kept closed with the space is unoccupied
- Improving the lighting equipment and controls in the foyer and City Council Chambers is an opportunity to improve the public image as an organization conserving energy and resource
- 60-80 percent of the employees are sufficiently uncomfortable at their desks to purchase and operate personal space heaters; the air distribution system should be rebalanced to preclude the need for almost all space heaters
- Having the police station integrated as an integrated part of City Hall requires an air handler, boiler, and water heater to operate 24/7 rather than primarily during business hours; this issue will be resolved soon when the Police Station is renovated with independent energy systems.
- Batt insulation is falling down from the roof decking and should be replaced
- Critical end uses in the City Hall are currently served from a utility meter in an adjacent building without a submeter to account for the energy used by City Hall; such a submeter should installed
- Perform a combustion efficiency test on the boilers and have the boiler adjusted to optimize efficiency and determine if plans to replace them are actually necessary
- Consider replacing the pressure-dependent air distribution control boxes with pressure-independent boxes along with a direct digital control (DDC) control system to provide better control and comfort
- Create and implement a more formal energy management plan
- Institute an energy accounting system to monitor (and hopefully explain) energy usage trends
- Perform an energy benchmark of the building and compare to similar buildings
- Consider hiring or contracting for the services of an energy conservation manager
- Maintain a close relationship with the Puget Sound Energy account manager and take advantage of assistance and generous financial incentives offered for conservation projects
- Take advantage of opportunity for outreach and recognition of efficiency improvements, including the greenhouse gas emissions associated with energy use reductions

Contents

Introduction

The purpose of this study was to provide a preliminary baseline assessment of energy use and efficiency improvement opportunities at Tumwater City Hall in Tumwater, Washington. This assessment was performed in support of the Washington Department of General Administration's Plant Operation Support Consortium, which is providing a broader range of technical support to the City of Tumwater for their facilities.

It is notable that the City of Tumwater has committed to improving energy efficiency by signing the U.S. Mayor's Climate Protection Agreement, committing to:

- Make energy efficiency a priority through building code improvements, retrofitting city facilities with energy efficient lighting and urging employees to conserve energy and save money;
- Purchase only Energy Star equipment and appliances for City use

Tumwater's Climate Action Plan notes that building energy use represents the second large source of greenhouse gas emissions. The Plan calls for reducing emissions to 7% below year 2000 levels. Part of the plan for achieving these emissions related to buildings is to continue an energy conservation program started in 2003. This includes replacing T-12 lamps with T-8

lamps, replacing older magnetic ballast with new electronic ballasts, and replacing incandescent lamps in exit signs with LED lighting. It also includes an information program to encourage employees to turn off lights. However, energy use in the City's buildings has been rising steadily since 2003 other than a slight dip between 2005 and 2006. While growth may be partly responsible for this lack of success, it seems that the City is not on track to achieve emissions reductions targets without a more aggressive energy management plan in place. The only other energy-saving plans we're aware of for this building are to replace the water heat and boiler.

This baseline assessment is by necessity a snapshot of conditions on the day of the visit and follow-up conversations. Some generalized observations, conclusions and recommendations will be made regarding energy efficiency. These conclusions and recommendations will need to be adjusted in the future if operation procedures and schedules change significantly from those observed during the assessment period.

This assessment was conducted on July 24, 2008, by Rob Penney and Bill Kingrey, professional engineers at Washington State University Extension Energy Program.

Benefits of Improving Energy Efficiency

There are many direct and indirect benefits of improving energy efficiency, including:

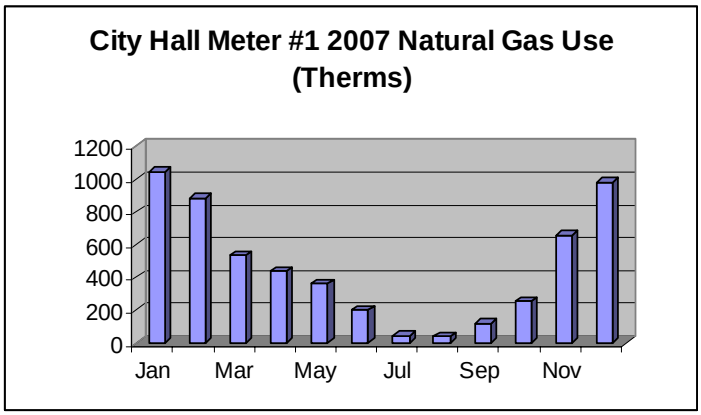
- Cut energy bills, freeing up funding for staff and other important resources
- Offset rising energy rates
- Identify low/no cost improvements in operation and maintenance
- Improving staff productivity through improved lighting, comfort, and indoor air quality
- Public appreciation for wise use of natural resources
- Cut "carbon footprint"
- Take advantage of generous utility and government incentives now available
- Favorable media attention, awards, and recognition

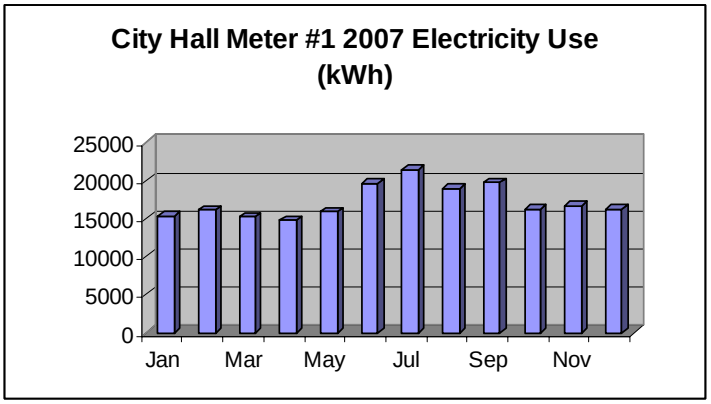
Energy Use Analysis

Electrical service is provided by Puget Sound Energy (PSE). The utility bills can be challenging to understand, but at about $25,000 annually, are worth making an effort to understand. Many organizations pay their energy bills without regular analysis of their content, so a few observations about the bills from December 27, 2006 to December 26, 2007 are shared below:

- There are no fewer than 12 components to the monthly bills, some of which are difficult to understand. In 2007, there were six rate changes, the January electric use wasn't billed until February, and the November gas bill compensated for a meter reading error in October of over 200 Therms.
- It's useful to maintain a close relationship with the utility's account representative to ensure that the City understands the utility bills, utilizes the most appropriate rate schedule, and takes maximum advantage of all the resources and incentives that the utility has to offer.
- The average electricity energy charge is 7.9 cents per kWh. However, once all the fees, credits, and taxes are included, the average rate is 8.9 cents per kWh.
- The average rate for natural gas is $4.55 per Therm.
- The PSE meter #1 measures energy use of the City Hall, but excludes critical end uses in City Hall that are served from meter #2 in the adjacent building.

- A demand charge is included for months when demand exceeds 50 kW, which is roughly half the year and totaled $644. The City may want to consider a demand reduction measures to reduce this fee, especially after the demand rate rose 50% October 1.
- The use of natural gas varied considerably from 38 Therms in August when some staff were likely on vacation and it was only used for staff lavatories as well as showers for the Police Department, up to 1048 Therms in January when heating peaked due to an unusually low daily average temperature of 37 degrees F.
- Electricity use varied considerably less, dropping less than a third from the summer peak with air conditioning to the winter low, used primarily for lighting and office equipment. This reflects the city's mild summers—a peak average daily temperature in July of only 67 degrees F, the envy of much of the country.
- The City pays hundreds of dollars annually through their utility bills into PSE's energy conservation program, so has additional incentive take advantage of utility assistance and incentives.
- A wind power production credit yielded a reduction of utility bills of almost $300.





- Utility rates seem to change almost monthly. Some of these may seem insignificant details, but when a facility manager is trying to cut energy costs 5% and the energy charge rises 10%, energy costs will rise despite his efforts. It is therefore important to look at cutting energy use (which can be controlled) rather than energy costs (which can only partially be controlled).
  - January 13: the energy charge for electricity increased 9.3%, the cost of gas increased 2.3%, the credit for wind power more than doubled, and the power cost adjustment (reflecting sudden increases in PSE's costs) dropped to zero
  - April 1: the energy for electricity dropped back down to almost exactly what it had been the spring and the cost of gas rose another 0.6%
  - June 6: the energy conservation contribution rose about 6%
  - September 1: the power cost adjustment was restored to about a third of the previous level
  - October 1: the energy charge for electricity rose just over 10%, the demand rate rose by 50%, and the gas delivery charge dropped 0.2%
  - December 3: the Tumwater City Tax dropped 2%

Site Visit Findings

Lighting

- **Office Spaces:** Lighting in the office spaces is a mixture of the original T-12 fluorescents in fixtures with parabolic reflectors and 150-watt incandescent can lights. In the basement, T-8 lights are used in what appears to be the same "egg-crate" parabolic fixtures as upstairs. Throughout the office space, the fluorescent lamps are varied in their color temperature (warm and cool colors mixed randomly).
- **City Council Chambers**: In this space, also used as a courtroom, indirect fluorescent cove lighting is provided in the ceiling with recessed can fixtures with horizontal compact fluorescent lamps. The ceiling is textured and painted with a grayish color that is noticeably ineffective and reflecting light downward. A bank of 15" fluorescent U-tube fixtures illuminates the Council members during TVW broadcasts.

- **Foyer**: In the foyer, daylight is plentiful but no daylight harvesting dimming controls are installed, so the lights are all operating. Some exterior lighting is operated 24/7 unnecessarily.

HVAC

- **Main System:** The HVAC system consists of four air handling units, two boilers circulating 140-150-degree water to hydronic coils in the air handling units, electronic controls, and four ground-mounted condensing units with a single two-stage compressor. The 26 variable air volume boxes in the building are Parker variable volume/ variable temperature boxes (VVT). These units are pressure-dependent boxes controlled by a proportional thermostat that opens and closes the boxes in response to zone temperatures. The air volume of the main fan serving this system is varied as necessary by a VFD controlling the motor speed to maintain a fixed pressure downstream in the main ductwork. In the large system serving most of the first floor, first stage cooling is provided by an economizer and second-stage cooling for this and all the other air handlers in the building is provided by ground-mounted direct-expansion (DX) condensing units. Heating is provided by a hot water coil supplied by the boilers for all air handlers. The main unit serving the first floor runs 24/7 in order to condition the police station, which is occupied 24/7.
- **Council Chambers System:** The HVAC system serving the Council chambers is a constant volume unit with an economizer, DX coil and hot water coil. This unit runs only when the Council chambers are in use.
- **Basement System**: Five zones in the basement are served by two air handling Units (AHU) – one serving the training room, the other serving the remainder of the basement. The larger air handler serving all basement zones but the training room and is located in a basement mechanical room. It uses a bypass damper to reduce air volume for part-load operation and a hot water coil for heating. Because of space restrictions, there is no room to bring in air for an economizer, so no economizer is provided.

- **Training Room**: The unit serving the training room is a small three-ton residential unit with direct expansion (DX) and hot water coils served by the boilers.
- **Computer Room**: The basement also contains a telephone/server room cooled by two ductless split systems.
- **Boilers**: The boilers are Raytherm copper finned-tube boilers. Two units are provided and staged in accordance with outside temperature. The boilers appear to be in good condition, despite their age.
- **Air Distribution System**: The air distribution system is so unbalanced that it was estimated that 60-80 percent of building occupants utilize electric resistance space heaters or otherwise attempt to modify the air flow from diffusers and registers to improve their personal comfort. This is very inefficient. Realistically, there will always be a handful of employees how are not satisfied with the space temperature, but 60-80% dissatisfied enough to purchase a personal space heater indicates a serious malfunction of the system. The air handling unit fans operate 24/7 to accommodate the operation of the police station, which also wastes energy.
- **Variable-Volume/Temperature Boxes:** The VVT boxes are from a different era – because these units are pressure dependent, as one unit closes down to restrict flow, the pressure increases in the duct and all the other boxes receive additional flow until the VFD controller can react and slow the fan. The opposite happens when a box opens to increase flow – all the other boxes in the system receive less air. Because of this arrangement, the boxes are continually "hunting" – changing their flow trying to maintain the zone set point. Another problem with this system is the use of conventional diffusers instead of the slot diffusers normally used with shutoff VAV systems. As the flow rate drops, velocity through the diffusers drops and the air from the diffuser can no longer maintain enough velocity to allow it to "stick" to the ceiling – it then drops out of the diffuser creating cold spots directly under it – leading to numerous comfort complaints. Newer, pressure independent boxes use an internal fan to mix room air with primary air (from the AHU) which maintains constant volume to the space. In zones that are too cool, room air is mixed with primary air to maintain temperature and, if necessary, an electric heating coil is energized. These newer VAV boxes can be tied into the control system to run the fan just fast enough to provide the minimum required pressure to the most remote VAV box - minimizing energy use.

- **Ductwork**: The ductwork is nearly all sealed with mastic, which is effective in preventing leaks. However, some recently replaced ducts have not been sealed with mastic (note the seam at the right on the photo). The access panel in the basement mechanical room was particularly loose.

- **Zoning**: The HVAC system in the Council chambers is set back, but the door between the chambers and the lobby is not consistently kept closed, so that the cooler or warmer air of lobby mixes with air from the chambers.

- **Air-side Economizers.** These are provided on all air handling units except the unit serving the basement. These allow for the use of cool, outside air for cooling, precluding the need to air conditioning. This can be a significant energy savings in our climate. However, an alarming percentage of economizers on commercial and institutional facilities do not operate as intended—if at all, so proper operation can't be assumed and should be checked regularly.
- **Controls**: The existing control system by Parker-Carrier is electronic and twenty years old and lacks the capabilities of more modern direct digital controls. Temperature settings for cooling range from 71-75 degrees while heating settings range from 68-72 degrees.

Water Heating

- The water heater, an AO Smith Lime Tamer (BT-197-860), is a 97-gallong commercial unit located near the boilers and is of the same era. It seems to be approaching the end of its useful life. The estimated energy factor of this unit at about 0.62 – this means that 38% of the energy supplied goes up the stack or is lost from piping. The water heater is capable of producing 180 degree water but is reportedly set to 110-120 degrees.

Building Envelope

- The walls wood-framed with masonry exterior.
- The windows are aluminum double-glazed with a U-value of approximately 0.60.
- The roof is wood-framed and sloped with tile, approximately R-30 fiberglass batt insulation with a foil face that minimizes the heat radiating from the roof down to the ceiling. Insulation is installed in between the roof joists so that the attic is part of the insulated shell of the building. In some areas, the insulation has been disturbed and is hanging down from the roof or missing entirely (see photo at right).

Other

- A serious obstacle to analyzing the electrical energy used by the City Hall is fact that most of the building is served by one electrical meter but more critical end uses are served by a the meter serving Building #2, and the power serving these critical end uses is not sub-metered. Critical end uses include the boilers, pumps, septic, some lighting, and cooling for the training room, which is used for meetings during emergencies. Therefore, is not is impossible to determine how much electricity the City Hall uses.

Recommendations

Lighting

- Measure the lighting levels in each area and compare with the lighting levels appropriate for the type of work currently being performed in that space. If a space is over-lit, lamps and ballasts can be removed from fixtures, lower wattage lamps can be selected, or ballasts can replaced by those with a lower ballast factor.
- When fluorescent lamps start to fail upstairs, initiate a program of group relamping with T-8 lamps, replacing ballasts with energy-efficient models in the process. It may be more cost-

effective to replace lamps, ballasts, and reflectors as part of a fixture insert or with an entirely new fixture.

- Paint the ceiling of the Council chambers with a brighter, lighter color to better reflect light downward.
- Stock fluorescent lamps with only one color temperature (80-85 CRI) to achieve uniformity and improved lighting quality.
- Replace any incandescent lamps in exit signs with LED or CFL inserts or replace with LED, CFL, photoluminent or electronluminescent models.
- Install an automated dimming system for foyer lighting to take advantage of plentiful daylight. Especially if some companion signage were provided, this would send a subtle message to all visitors that the City is committed to energy efficiency, fiscal responsibility, and is uses modern technology to accomplish this.

HVAC

- Monitor space temperatures throughout the office space without the use of electric resistance space heaters and then hire a contractor to test and balance the air distribution system to preclude the need for such space heaters. Direct occupants to report their discomfort and avoid utilizing personal space heaters or modifying the heating system diffusers and registers. While is it impossible to satisfy the comfort needs of all occupants simultaneously, a well balanced system can greatly increase comfort for many while decreasing energy use.
- Investigate replacement of existing Parker-Carrier pressure-dependent variable volume / variable temperature (VVT) air distribution control boxes with pressure independent series VVT boxes, which will provide better control and comfort. As part of this process, it would be wise to reconsider the zoning to better accommodate the current occupancy patterns.
- The primary building automation system should be replaced with a direct digital control system (DDC) as part of the VVT box replacement.
- Investigate the cost-effectiveness of replacing the air handling unit serving the basement with a model that designed for use with VVT systems.
- Set the dead band between heating and cooling settings for each space to a minimum of five degrees F, as per the Washington State Energy Code section 1412.2.
- Inspect the operation of the air-side economizers to ensure proper operation.
- When HVAC motors require replacement, choose only Premium-efficient models utilizing MotorMaster+ software, available free of charge from the U.S. Department of Energy (http://www1.eere.energy.gov/industry/bestpractices/software.html#mm)
- Provide a separate HVAC system for the police area of the building to allow night setback of the majority of the building.
- Perform a combustion test to ensure the boilers are operating at optimal efficiency and rethink plans for replacement; older boilers may be almost as efficient as new boilers if well maintained and operated.
- Investigate replacement of the existing condensing units to determine if it is cost effective to replace them.
- Adjust all duct access panels to seal tightly.
- Provide night set back in all zones where it is possible
- Check all dampers for leakage and replace any missing or deteriorated seals or gaskets.

Water Heating

- Consider replacing the existing water heater with a storage tank with a heat exchanger connected to the existing boilers. This will eliminate the stack losses from the water heater and improve efficiency.
- If a recirculation pump is used, ensure that it is operated with a timer such that it will not run during unoccupied periods.
- Use a thermometer to ensure that the hot water temperature at the fixture closest to the water heater is not over 120 degrees F.

Building Envelope

- Reinstall the radiant barrier and insulation where they have been disturbed and are hanging down from the roof.
- Although the attic space is within the insulated shell of the building, it is not conditioned, so it would effective to install weatherstripping on attic access doors.

Other

- Install a sub-meter on the power feed coming from Building #2 to provide power to critical end uses. This will allow an actual accounting of energy used at City Hall as well as the adjacent building, which is currently not possible.

Energy Management Planning

Improving the energy use of a building is a big team effort. It requires support from City Council and the Planning Commissions, Public Works planners, maintenance, and operations staff, building occupants, and some specialized expertise from outside parties. A more formal energy management program should be launched with the following steps:

- Gain top level commitment
- Set up a system of energy accounting and establish a baseline of historical energy use
- Set realistic goals
- Assign responsibilities
- Perform a comprehensive energy audit yielding prioritized energy saving opportunities
- Implement low/no cost recommendations
- Evaluate and prioritize capital improvement projects
- Implement capital improvement projects
- Evaluate results and communicate through media and awards

Benchmarking

Benchmarking is a process where you calculate a building's energy use and compare it with other, similar buildings to find out how your energy consumption compares with similar buildings in your area. In order to benchmark your building you will need to gather the following information:

- At least 12-months of energy consumption and the total monthly costs of each.
- Area of the building in square feet (measure or copy from the plans).
- % of the building area that is heated
- % of the building area that is cooled

- Number of students or workers
- Number of computers
- Weekly operating hours
- Number of months the building is used each year

When you have this information go to the Environmental Protection Agency's Portfolio Manager (PM) at: www.energystar.gov/index.cfm?c=evaluate_performance.bus_**portfoliomanager** - 26k . You'll need to register, and then input the data for your school following the directions at the website.

One of the first things you'll be asked for is the type of building - choose the option closest to your building type. When you've finished inputting the data, the PM will calculate the building's energy use in units of thousands of Btu per square foot per year (kBTU/sf-yr) and then rate the building against other similar buildings in your area.

Resource Conservation Management Program

An RCM program is a coordinated effort to manage the resources and services used, and waste generated, by the facilities of a municipality or school district. It involves careful tracking of resources and attention to operational efficiency. The program focuses on occupant comfort, cost-effectiveness and assuring that equipment is used only when needed. Operational savings are gained through organization, analysis and communication.

With a comprehensive RCM program in place, you can expect to see quantifiable results in the first one to six months. Most RCM programs achieve 10 to 15 percent savings on utility bills after the first year depending on the number of facilities involved and level of management commitment.

RCM strategies have been used in industry and large corporations for many years. As public-sector budgets shrink, RCM programs are cropping up in many organizations, both large and small.

It has been shown to be effective to have someone dedicated to reviewing and improving the energy efficiency of a facility. Given the size of the organization, this may be less than a full-time person, but at least even part of a person can be more effective than having this responsibility diffused among busy people with many competing roles and responsibilities. You can hire a RCM as staff within your organization, or you can contract for services to perform RCM activities. There is program and financial help available from Puget Sound Energy, and different program support available from the WSU Energy Program.

Puget Sound Energy (PSE):

The PSE RCM program is available to any school district, public–sector government agency, and commercial or industrial customers, focusing on larger customers with multiple facilities. The RCM program takes an all-resource approach. PSE will work with the customer's designated Resource Conservation Manager whose assigned responsibilities include increasing efficiency and reducing costs of:

- Electricity
- Natural gas
- Water and sewer
- Solid waste and recycling programs

The RCM is retained by the customer and is accountable for bill savings attributable to efficiency improvements in:

- Occupant behavioral practices by building occupants
- Operations and maintenance practices by administrators, managers, and operations personnel.

Most of the savings are from changes in practices, and do not require major investments in equipment. RCM also helps identify and champion projects which qualify for additional Puget Sound Energy (PSE) incentives such as:

- Lighting system improvements
- HVAC systems and controls
- Building thermal improvements
- Water heating system improvements
- Retro commissioning

To learn more, contact a Lori Moen at (425) 462-3274 or lori.moen@pse.com.

Washington State University Extension Energy Program (WSU):

WSU provides support for RCMs in Washington, including an on-line RCM guidebook and monthly newsletters. They can help cities hiring a RCM by providing job description examples and consultation on hiring a RCM. Once a city has an RCM on staff, WSU can also provide technical support through their Northwest Buildings Efficiency Center. Their RCM website is: http://www.energy.wsu.edu/projects/rem/rcm.cfm. They NBEC website is: www.nwbuildings.org. For more information, contact Karen Messmer at (360) 956-2090 or MessmerK@energy.wsu.edu.

Contracting for RCM services

There are likely other companies offering RCM services. One is McKinstry, which offers Resource Conservation Management services on a contract basis. For more information, contact Ray Burton at 206/832-8115.

Potential Financial Incentives

Fortunately some incentives are being offered to encourage earlier adoption of better technology.

Puget Sound Energy (PSE)

PSE's grant programs can provide you with a custom incentive to provide funding up to 100 percent of the installed cost for any energy-efficiency project resulting in increased efficiency of equipment fueled by electricity or natural gas supplied by PSE to a business. PSE's grant programs help fund the construction, upgrades, and people that increase the efficiency of your facilities. Grants can help fund:

- Efficiency retrofits and upgrades on existing facilities
- New construction
- Expansion of existing facilities

PSE's rebates offer a simple and easy-to-use way to receive funding for common, energy-efficiency improvements. They have more than a dozen rebate programs with over a hundred options for commonly-applied efficiency upgrades. Applicants must submit an application

approved, install the equipment, and then submit the required documentation and PSE will send a check. For more information, call a PSE Energy Advisor at (800) 562-1482.

Federal Tax Deduction

For lighting systems, a federal tax deduction program specifies that:

> "…a deduction of $0.30 per square foot can be taken if the lighting system employs dual switching (ability to switch roughly half the lights off and still have fairly uniform light distribution) and reduces installed lighting power by at least 25% from values specified in specific cited tables in ASHRAE Standard 90.1-2001. As lighting power reductions climb from 25% to 40%, the deduction is increased proportionally, up to $0.60 for a 40% power reduction (plus the dual switching). This prorated credit does not apply to warehouse lighting." http://www.energytaxincentives.org/business/commercial_buildings.php

An important condition of qualifying for this deduction, which can be as high as $0.60 sq.ft., is that bi-level switching controls be installed. For additional details about the law see Appendix H: Energy Policy Act Laws and Incentives. Learn more about the federal deduction at http://www.lightingtaxdeduction.org/tax_deduction.html.

Opportunities for Outreach and Recognition

It can be helpful to document and share results from successful energy efficiency improvement projects. This can result in public recognition, winning awards, and sharing lessons learned with similar facilities. Some candidates for this include:

- If the building's energy use rating (see under Benchmarking above) is 75 or more (meaning that it uses less energy than 75% of all buildings of the same type, it is eligible for Energy Star certification (http://www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_eligibility)
- If the building is remarkably and creatively resource-efficiency in its construction and operation, it may be a good candidate for the Washington Governor's Award for Sustainable Practices (see http://www.ecy.wa.gov/programs/hwtr/GovAward/index.html).
- Work with the Plant Operations Support Consortium to write an article for their ShopTalk Newsletter (http://www.ga.wa.gov/Plant/SHOPTALK.HTM)
- Work with the Association of Washington Cities to write an article for their The Operator newsletter at https://wacities.org.

Information Resources

- **Puget Sound Energy** (PSE) offers grants, rebates, a resource conservation manager program, and a direct installation and maintenance program as well as an on-line audit, a web-based application that provides access to usage data from your meters, and the Energy Smart information library. For more information, call them at (888) 225-5773 or link to http://www.pse.com/solutions/forbusiness/Pages/efficiencyComPrograms.aspx.

- **U.S. Department of Energy's** (US DOE) EERE Information **Center** can provide technical assistance on a wide variety of building efficiency questions. You can call them at (877) 337-3463 or link to them at http://www1.eere.energy.gov/buildings/.
- **WSU Energy Program Library** has funding from US DOE to provide information for anyone in Washington State information on energy efficiency. You call call them at 956-2076, link to them at http://www.energy.wsu.edu/library/, or visit them at 905 Plum Street SE, Building #3; they have one of the most extensive collections of literature and on-line databases in the country.
- **The Lighting Design Lab** in Seattle offers classes ranging from beginning home lighting to advanced controls workshops, both on-site and off-site. In many cases Continuing Education Credits are available for their classes. Their experienced lighting specialists will meet with you, either on-site or off-site, to review plans for your project and recommend efficient lighting and control strategies, cost-effective products, and other ways to give your building the quality lighting it deserves. You can call them at (800) 354-3864, link to them at http://www.lightingdesignlab.com/index.html, or visit them at 400 East Pine St. in Seattle.
- **The Northwest Building Efficiency Center** (NBEC) delivers information on energy efficient technologies to builders, code officials and public building managers so they can significantly reduce building energy use in the region. They offer publications, web resources, training, library research, technical assistance, on-site assessments, peer matching, and speakers. You can call them at (866) 929-6232 or link to them at www.nwbuildings.org.
- **Lightsearch.com** (www.lightsearch.com) is a specialized search engine for locating lighting products and companies. You can search for fixtures, lamps, ballasts and more.
- **Trade Ally Network** website at http://www.northwest-lighting.com/TradeAlly.aspx, where you may search for a variety of professional services.