Borton Lawson

ENGINEERING
ARCHITECTURE

Lititz Public Library

Lititz, PA

Submitted to:

A1 ENERGY
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June 18, 2009

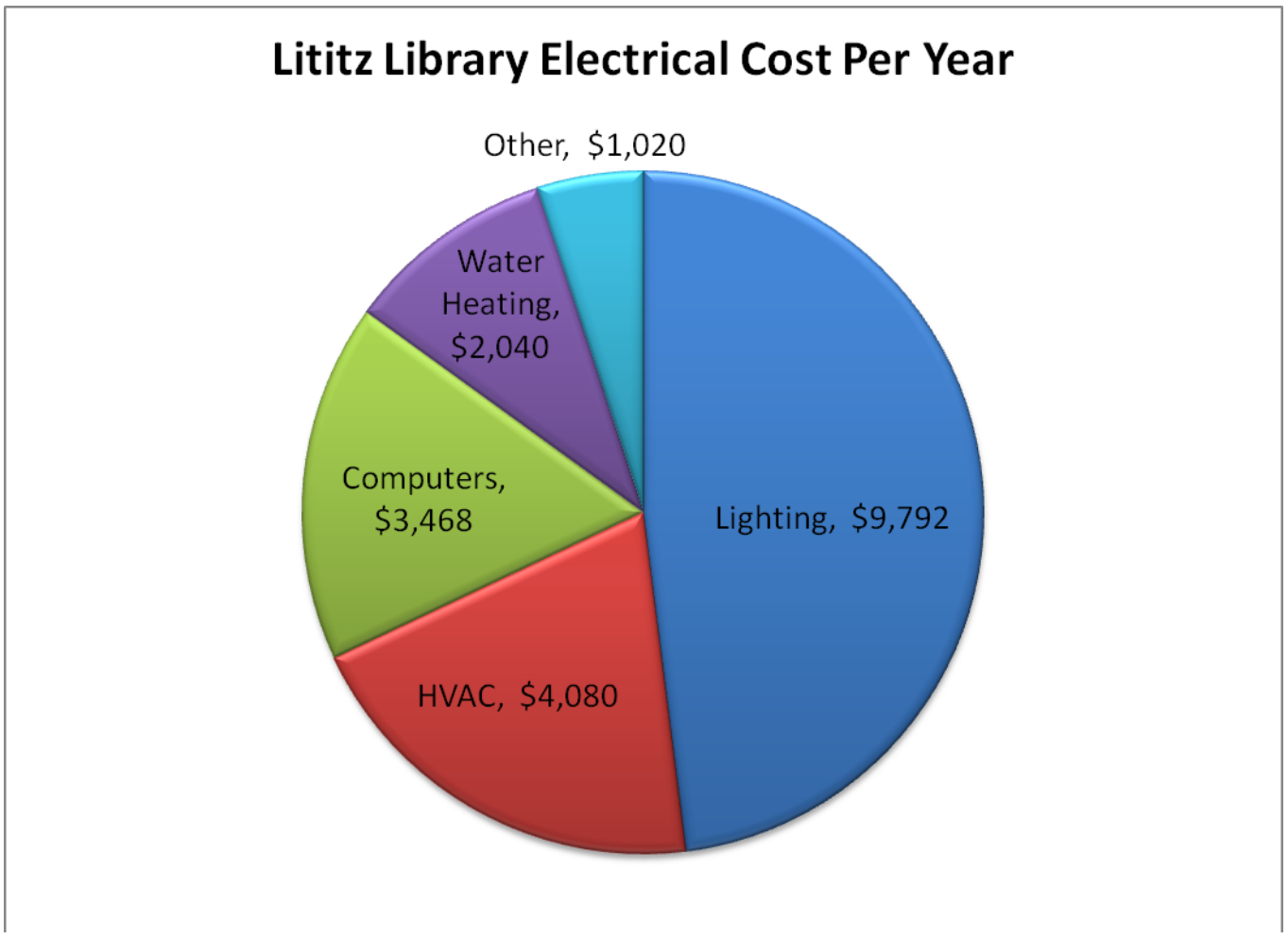
I. Executive Summary

Attached is a summary of Borton-Lawson's findings from a Tier 1 Energy Audit performed on June 2, 2009. The audit team consisted of Bill McFarland P.E. who performed the site visit and Pat Walko, P.E. who assisted in evaluating the mechanical systems.

Overall, the Lititz Library site is in excellent condition and care has been taken with the maintenance of equipment.

Upon reviewing the utility billing, the site currently pays $0.11 per kWhr. Expect an increase of up to approximately 55% when PPL eliminates their rate cap structure at the end of 2009.

Below is a breakdown of the current electrical usage at the site.



The items discussed below focus on reducing overall energy costs as well as maintenance and design enhancements. The items are not in any particular order but are designed to follow the Detailed Review.

Items are broken down into three categories 1) 'immediate' - for action as soon as economically possible 2) 'current' - for action to be taken within the current or next two budget years and 3) 'long term' - for action to be taken three years and beyond.

Items marked with an '*' may require engineering assistance typical of the type performed by Borton-Lawson. Please let us know if you would like to see a proposal for any of these services. Please be aware that grant and loans are available for most if not all of these items. Borton-Lawson will assist with any applications required for these funding sources.

The following items should be considered for immediate action:

- Install "Smart Strip" power strip that can sense when a computer shuts down and in turn shuts down other peripheral devices.
- Inspect exterior Dry-Vit for cracking and make repairs.
- Install occupancy sensors in conference rooms and restrooms.
- Replace exterior incandescent bulbs with CFL units.
- Change or install new fixtures for the flag light fixtures.
- Replace thermostat in the community room to a new multi-day / multi-hour unit. It is recommended that the Honeywell Vision PRO model of unit be used and installed by a qualified contractor.

Consider the following for current action:

- Replace exterior parking lot lighting fixtures with more energy efficient units.
- Change faucets in the restroom to motion sensor units.

Consider the following for your long-term strategic plan:

- Review a solar energy installation.*

The most cost effective and significant savings can be obtained with occupancy sensors, thermostat upgrades and interior lighting upgrades.

If you have any questions or comments on the study or would like clarification of these issues please do not hesitate to contact the Director of Electrical Engineering Services, William J. McFarland P.E., LEED AP, at 570-821-1994 x344.

II. Detailed Report

General Information

1. The facility is a library constructed in 1998 and is in excellent condition.

Envelope

1. Ceiling/Roof:
    a. The roof is in excellent condition.

2. Walls/Floors:
    a. Walls and floors are generally in good condition.
    b. Caulking is used where appropriate.
    c. The exterior walls are well insulated.
    d. Near the rear exterior window some cracking of the Dry-Vit is seen possibly due to the structure settling.

3. Windows/Doors:
    a. The facility has multiple windows; the existing units are energy efficient.

4. Reduce Infiltration:
    a. Overall there is little accidental loss of air via cracks, uncontrolled openings or building use.

5. Entrance:
    a. The main entrance has a vestibule system.

Lighting

1. Lighting Levels:
    a. Lighting levels appear adequate if not high for the tasks performed. Please note that no light readings were taken.

2. Task Lighting:
    a. Task lighting is used where necessary.

3. Light Colored Interior Wall Finishes:
    a. The current finishes meet the needs of the facility.

4. Interior Energy Efficient Lighting Systems:
    a. The vast majority of the high bay lighting is T8 and an upgrade is not required at this time.
    b. Occupancy sensors should be considered along unoccupied areas including restrooms and conference rooms.
    c. Exit signs appear to be energy efficient.

5. Exterior Energy Efficient Fixtures:
    a. There are 5 exterior incandescent fixtures that can be changed to more efficient CFL fixtures. Typically these lamps cost more but the energy use and the life span of the fixture creates a lower cost of ownership and uses 68% less energy.
    b. The flag pole is lit by two 250W metal halide fixtures. The wattage can be reduced or the fixture changed to a much more efficient fixture.

    c. There are 12 exterior metal halide parking lot fixtures that can be changed to more efficient fixtures. The cost benefit of induction lighting should be reviewed. Typically these lamps cost more but the energy use and the life span of the fixture creates a lower cost of ownership.

6. Use Day Lighting
    a. The window placement and the use of the space for reading make a day-lighting controlled system unlikely to meet the clients need.

HVAC Systems

1. General Systems
    a. The local thermostats are set for 74 degrees. Care should be taken to make sure that they remain set at this level and that minimal conditioned air is produced when the library is closed. Lockable covers should be installed on thermostats if customers or employees regularly change settings.
    b. The 11 exterior air conditioning units have a SEER of 12. These units are efficient to today's standards and there is no financial justification to change these units.
    c. The thermostat in the community room should be upgraded to a 5/7 day thermostat with multiple time settings.
    d. Heating is provided by natural gas and the units used are energy efficient.

Water Heating

1. Fixtures/Faucets
    a. Consider changing the fixtures to low flow motion detection in order to best conserve water. This would save approximately 40% of the restroom waste water resulting in the savings of 65 gallons per day. This would effectively cut the water bill significantly and save $20.00 per month.

2. Efficiency of the System
    a. The Rudd storage type water heating units located in the ceiling in 6 locations are energy efficient and do not need to be changed at this time.

Power Systems

1. Billing Structure
    a. The site is on general service rate, the proper rate for this facility from a tariff perspective.

2. Alternate Sources of Energy
    a. The site due to its location is not appropriate for wind generation at the current cost per kW per installation.
    b. The site appears to be conducive to having photovoltaic system installed on the roof however this has a major aesthetic implication to the site.

3. Arc Flash Compliance
    a. The electrical system does not meet the current OSHA, NFPA 70E or NEC code for arc flash protection.

4. Energy Efficient Motors
    a. There are few motors at the site. Any new motor installations should be rated NEMA Premium.

5. Computer Energy Conservation
    a. "Smart Strip" makes a power strip that can sense when a computer shuts down and in turn shuts down other peripheral devices such as monitors, printers and scanners.