

District Information

District Name: **Grass Lake Community Schools**
Address: 899 South Union St.
Grass Lake, MI 49240

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Buildings Surveyed

- ❑ Grass Lake High School
- ❑ Grass Lake Middle School
- ❑ George Long Elementary & Administrative Office

Executive Summary:

The Grass Lake Community Schools initial energy audit revealed many energy saving opportunities, which will result in budget and carbon footprint reductions. The process used included several steps to arrive at the conclusions found herein.

- First, we talked with the Superintendent, Maintenance Supervisors and Custodians for the individual buildings.
- Second, we collected the energy data for the district and evaluated individual building performance.
- Third, we walked through the buildings and talked with available Principals, as well as staff, students, and parents in the buildings.
- Finally, we entered into discussions with stakeholders to validate the information found in the Executive Summary report.

The goals and objectives found below are the result of the validated information with all parties concerned. Based on the summaries of individual buildings, the suggestions offer a starting point for the district to tackle the Behavioral and Technical issues summarized in this report.

A critical next step is the formation of an Energy Taskforce to provide leadership and facilitation of the Energy Program Management program at Grass Lake Community Schools. The suggested process is: naming the members of the team, setting roles & responsibilities, and publishing the list district-wide.

Behavioral Issues:

- During the day, lighting in **Classrooms** is sometimes found to be on when unoccupied. Most areas of the district's buildings have T-8 lighting.
 - Mini-fridge policies are defined, but a few were observed on school property. Additionally, the annual audit process is not defined, the energy efficiency of the refrigerators is unknown, and the U.L. standard for safety is not published to the district.
 - Some space heaters were observed on district property. There are also microwave ovens and coffee makers in storage areas.
- **Information Technology** represents a largely untapped energy conservation resource. Some computer monitors were observed to be running with Windows icon screen savers causing constant operation of the CPU. Some computers are left running at night in the labs and classrooms (there may be an opportunity to use LAN level software for shut-down after hours).
- **Community usage** impacts the facilities energy footprint at the high school with men's basketball, Expos, scrap-booking, soccer, and JCC. The middle school is being used a couple of nights per week for community gym activities: youth wrestling and basketball, etc. The Elementary has 2 Special Purpose rooms designated for community usage.
- Empty **Offices** were observed with lights, copiers and computers running. Many printers and copiers are not using the Energy Saver mode so shut-down appears to be manual.
- **Restrooms** need occupancy sensors throughout the district. Most restrooms have standard flush valves with timed or auto faucets.
- **Hallway** lights were all found to be operating at the following schools around 9:00 pm: Grass Lake High School, Grass Lake Middle School, and George Long Elementary & Administrative Office.
- Some **Media Center** lights are all on, even while unoccupied even though most library areas have good day lighting potential (except M.S.).
 - Reading resource area lights were mostly off.
 - Some lights are left on in book storage areas.
 - PC labs are using Windows icon screen savers.

MSBO - Energy Essentials

- **Food Service** opportunities vary by building but generally involve extended usage and early start-up of range hoods, ovens, warmers, and cafeteria lighting.
 - Beverage coolers / refrigerators were found to be on but empty in some areas.
 - Typically, the sustainability practice (cooler/refrigerators) of consolidation down-to-one during the summertime is not being practiced.
 - There are some vending machines found throughout the district's property. Most of these are not lighted which is a very good practice.
 - The elementary school kitchen appears to be full service with more equipment found at the high school and middle school.
- The **Sports Complex** includes: gyms, weight room, and locker areas for boys and girls. The High School and Middle School Gyms are used for longer periods in the winter due to sports schedules.
 - High School, Middle School, and George Long Elementary gym lights are T-8 High Output fluorescent and operate all day long. It is believed that a combination of usage patterns and walk-thru traffic causes the lights to remain on.
 - Locker room area lighting is on all day.
 - The gyms are used on weekends, plus some nights are open gym for the community. Practices occasionally go until 10:00 pm.
 - Concession area coolers run 24x7 but are typically only used on the weekends.
- The **Auditorium** has incandescent lighting and was on while unoccupied during walk-thru.
 - There are nite-lites backstage.
 - Kept at 70 deg. F due to a grand piano. We suggest moving the piano to the stage left storage area so temperatures can drift down to 50-55 degrees F when unoccupied.
- The **Bus Garage** is a stand-alone building which provides both parts storage and workshop space.
 - The Bus Garage has (3) bus stalls, which are being actively used. There are fluorescent lights, which are left on all day, even while unoccupied.
 - Bus heaters (~1500 Watts each) are NOT on a timer, which operates from approximately 4:00 pm - 8:00 am daily.
- **Parking / Perimeter Lights** are on dusk to midnight and then usually on at 5:30 am to dawn in most of the buildings. Perimeter and parking lot lighting is being used for security purposes causing increased energy footprints. These are a combination of lighting technologies.

Technical Issues:

- **Lighting** in most of the buildings' hallways and classrooms is T-8 florescent.
 - Display cases are operating 24x7 unless a custodian shuts them off.
 - Exit sign lights are a combination of LED and incandescent.
 - Nite-lites are still being used in most of the buildings.
- **Faculty Lounge(s)** that have pop machines are unlighted, which is almost universally found, throughout the district.
- The **Gym Lights** are T-8 HO Fluorescent, but are on most of the day.
 - Locker room areas need occupancy sensors.
 - High output florescent lights are usually recommended for all gym areas to enable shutdown and/or occupancy sensors when not in use.
- **Kitchen** areas appear to be in need of occupancy type technologies like sensors for lighting in storage areas.
 - Equipment should be evaluated for energy efficiency and upgrade as is feasible.
 - Exhaust hoods are manually operated: do not have timers or automated shutdown. There is not an interlock with the BAS
- **Restrooms** have been retrofitted with T-8 lighting but not occupancy sensors in areas visited.
 - Faucets are mostly timed use and Toilets are standard flush.
- The **Building Automation Systems** are Siemens Apogee or JCI MetaSys or Trane Summit DDC front end overlay with some mixed pneumatics at the room level.
 - Seasonal scheduling and holidays should be checked every quarter.
 - Air compressors draw electricity 24 x7 when running due to static air pressure requirements for operation. The tubing throughout a building may develop leaks over time and cause excessive operational time.

MSBO - Energy Essentials

- **Boiler** usage and age vary by buildings. The boilers appear to have a hot deck reset for Summer vs. Winter.
 - Grass Lake High School has (2) LES boilers around 2007 vintage and (2) Lochinvar Domestic Hot Water (DHW), pumps run 24x7. There are also DX-Vertical Unit ventilators for this building.
 - Grass Lake Middle School has (2) RayPak boilers around 2002 vintage and a PVI Domestic Hot Water (DHW) with a 750 gal. tank, pumps run 24x7. There is also a Chiller for this building with a BAC Cooling Tower.
 - George Long Elementary School has (2) LES boilers around 2006 vintage and (2) Lochinvar Domestic Hot Water (DHW), pumps run 24x7. There are also (3) Trane Rotary Chillers for this building.
 - Individual classrooms have restrooms in many areas of the buildings with RUUD DHW.
 - Additional A.O Smith 199K DHW for the kitchen area.
- **Doors** are occasionally propped open throughout the year. The Middle School and Elementary Schools door seals and/or doors need replacement.
- **Windows** were found to be double-glazed throughout the district.
- **Parking Lot / Perimeter** lighting is on a timer and photocell. Lighting schedules need to be checked on a monthly maintenance basis.

Summary of District Process Opportunities:

1. **Budgeting for Performance and Measurement**
 - Current energy consumption
 - Process improvements impacts
 - Grants for the schools
2. **Operations Technical, Preventive Maintenance, and Training**
3. **Review of Educator Best Practices to Encourage Environmental Awareness**
4. **Information Technologies Energy Standards**
5. **Food Service Opportunities**
6. **Custodial Observations/Ideas**
7. **Evaluate the Use of Buildings**
8. **Community Awareness Programs**
 - Day Care programs
 - After hours community usage
 - Special events
9. **Work with Principals to Set Performance Goals**
10. **Energy Program Training**
 - Teachers and Staff
 - Students
 - Community
11. **Annual Audit for the District's Energy Policy**

Summary of Building Performance Opportunities:

1. **Lighting Usage and Efficiency**
 - Behavioral expectations
 - Retrofits, maintenance, and upgrades
2. **Computer Hibernation**
3. **Facility Control System Issues**
 - Ventilation/ temperature/ pressure/ energy control issues
 - Calibration (if possible), otherwise repair or replace
 - Scheduling of lighting / HVAC systems
4. **Preventive Maintenance**
 - Unit Vents
 - Clean and inspect Air Conditioning units
 - Window / Door maintenance or upgrades
 - Clean filters quarterly
5. **Annual Appliance Audit**
6. **Evaluate Domestic Water Systems**
7. **Implement the School Dude – Utility Direct program**

