

Energy Savings from Lighting in Oakland High Gym: Evaluation of Proposed Plan



by

Heather Bach, Cody Dam, Lien Dang, Kevin Fulgado, Trinh Huynh, Louis Lam, Jason Lay,
Davis Le, Angela Luu, Lan Ngo, Eric Phung, Donald Sun, and Eva Xu

Environmental Science Academy
Oakland High School
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Purpose & Procedure of Energy Audit

- *Identify areas where energy was inefficiently used.*
- *Look for measures to save.*

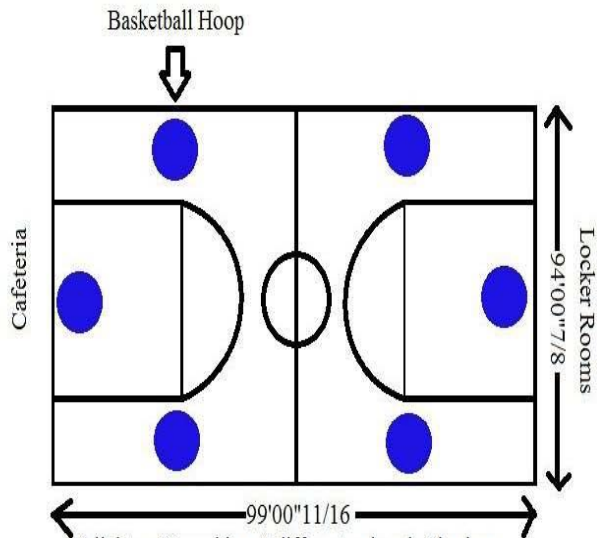


With mentorship of Puck Ananta, Mechanical Engineer and LEEP (Leadership in Energy Efficiency Program) Program Manager, we:

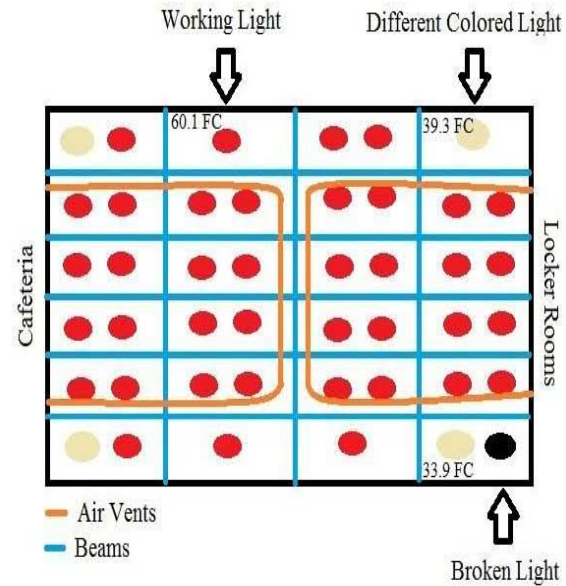
- Identified dimensions of the gym (Laser distance meter)
- Measured light levels and brightness (Lux meter)
- Mapped current condition and placement of lights
- Calculated financial and energy costs and savings for proposed plan



Gym Layouts



44 lights - 40 working, 3 different colored, 1 broken
 Working lights - 60.1 FC
 Different colored lights - 39.3 FC
 Corner w/ broken light - 33.9 FC
 Height of gym - 24'08"





Proposal

- Change metal halides to T5 fluorescent lamps
- Add occupancy sensors



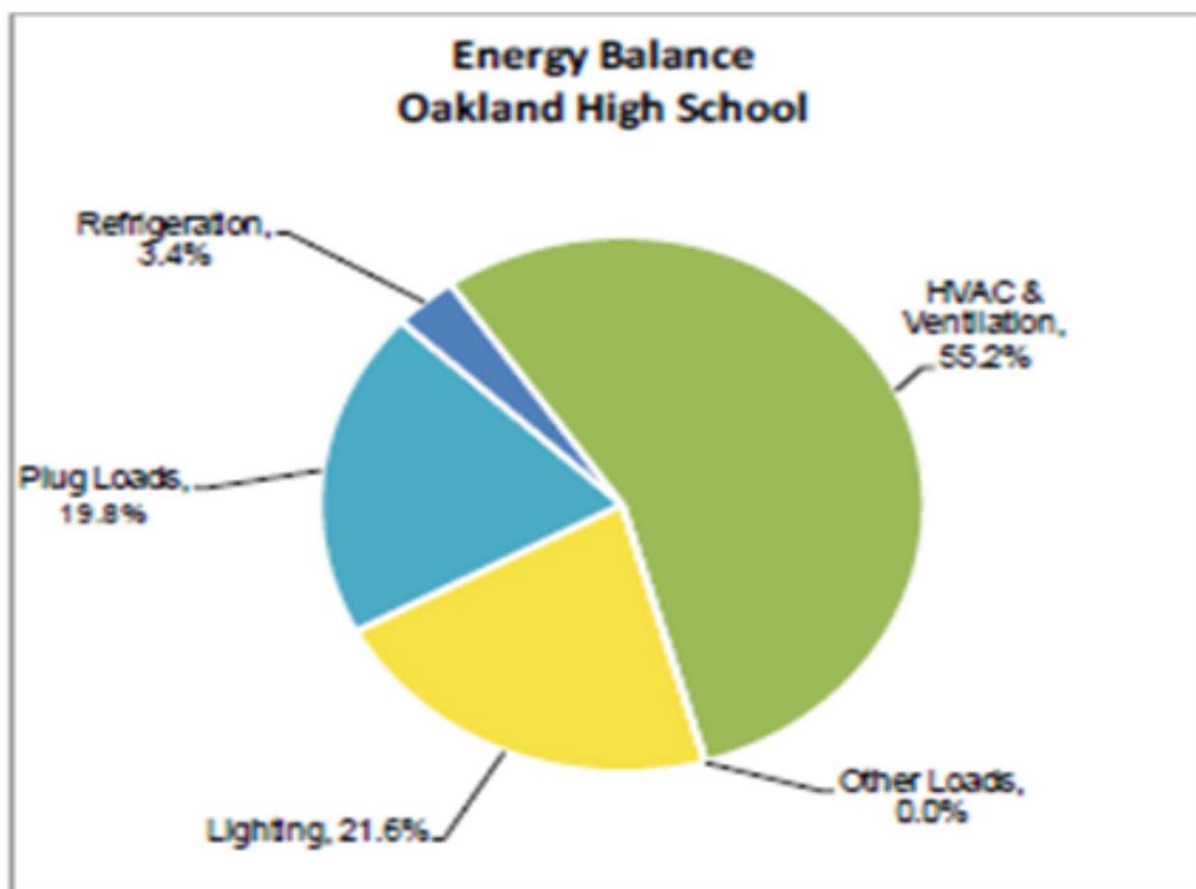
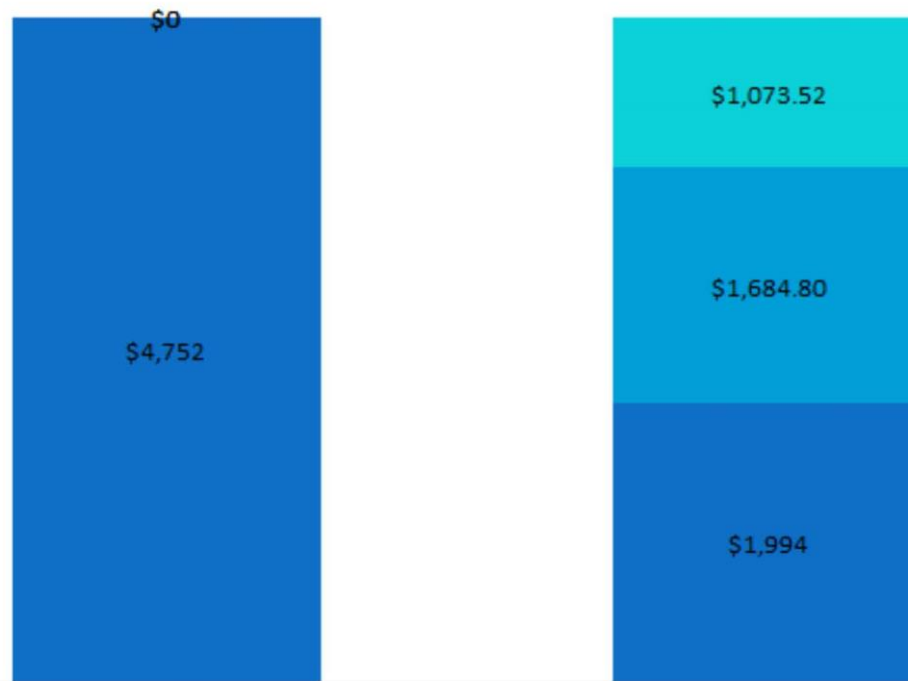


Figure 3.8: Energy Balance – Electricity

Costs Of Old System vs New System

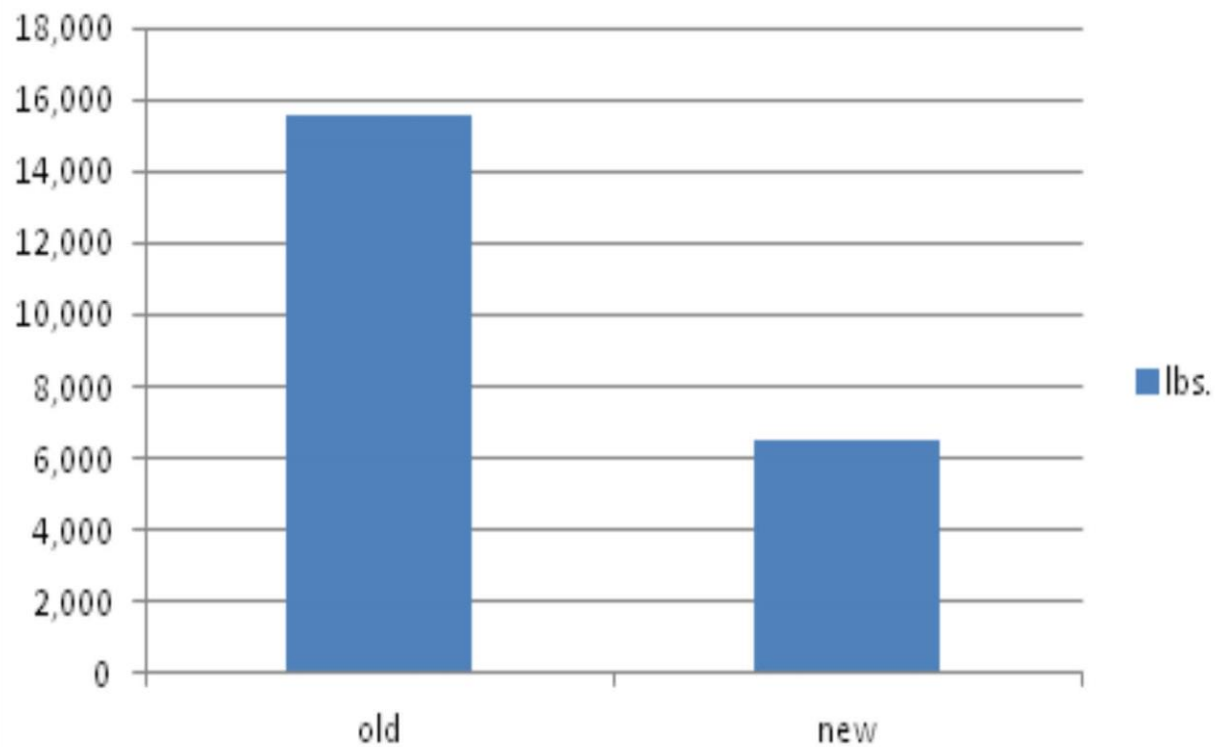
■ From Load ■ From Efficiency ■ From Hours



Old Fixtures

New Fixtures

lbs. of CO2



Old & New Light Comparison

Old

- Ballast can be noisy
- Takes up to 10-15 minutes to restrike after shutdown
- Color shift
- A point source light
- Increased temperature levels in the hotter months.



New

- Produces better image clarity and truer actual color renderings.
- A well-diffused spread with excellent coverage.
- Maintains a cooler fixture.
- Better restrike
- Quiet electrical ballasts



Conclusion

- With the newly implemented occupancy sensors:
 - energy cost will be cut in half.
 - more money for other fundings.
- Carbon emissions reduced by 66%
- Estimated to pay for itself in 4-5 years.



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Interns' Comments

- “We are implementing a new plan to save this school money!”
- “I am very grateful for this great real world learning experience. I want to make a possible impact on people’s lives.”
- “This internship was very helpful and I would recommend this to others in this school and even in other schools.”

Oakland HS Environmental Science Academy – Class of 2013

