**Short Version**

**Project summary**

Temple Hoyne Buell Hall (TBH) was built in 1996 and is home to the Architecture, Landscape Architecture, and Urban Planning departments. The 73,000 square foot building was designed so that most classroom, studio, and office spaces have natural light available during the day. However, no automatic lighting controls were specified or installed in the building.

To encourage awareness of energy use among design students and faculty, and to reduce lighting and cooling energy use in the building, we will install occupancy, daylight sensors, and lighting timers in appropriate places within the building. Additionally, a small selection of fixtures will be replaced with LED fixtures. All incandescent and fluorescent exit signs in the building will be replaced with LED exit signs.

By reducing lighting waste in classrooms, public areas, restrooms, and service spaces, electric use for lighting will be reduced by approximately 30% in the controlled areas. The energy required to cool the building in the summer will also be somewhat lowered, by reducing the amount of waste heat generated by lighting. TBH uses 1.7 million kWh of electricity annually at a cost to the University of $120,000. Educational buildings in the U.S. use an average 20% of their electricity for lighting, and lighting retrofits and controls can save 30-50% of that lighting energy use. If lighting controls were implemented in TBH, an estimated 100,000 to 170,000 kWh annually could be saved. The value of those electric savings at university rates is around $7,500 - $12,700 annually.

**Project summary**

Temple Hoyne Buell Hall (TBH) was built in 1996 and is home to the Architecture, Landscape Architecture, and Urban Planning departments. The 73,000 square foot building was designed so that most classroom, studio, and office spaces have natural light available during the day. However, no automatic lighting controls were specified or installed in the building. This has two energy-wasting effects. First, many lights are on during the day when natural light would suffice. Secondly, many lights are left on during both day and night when spaces are unoccupied.

To encourage awareness of energy use among design students and faculty, and to reduce lighting and cooling energy use in the building, we will install occupancy, daylight sensors, and lighting timers in appropriate places within the building. Occupancy sensors turn lights off when no activity is detected in a space for a certain period of time. Daylight sensors turn lights off when natural light provides enough illumination for the normal function of that space. Timers turn lights off according to a programmed schedule.

Additionally, a small selection of fixtures will be replaced with LED fixtures. All incandescent and fluorescent exit signs in the building will be replaced with LED exit signs. The three large HID lights high above the atrium space will be replaced with LED fixtures and lamps. LED lights have very long life and significantly lower energy use, and are particularly suited to lights that must be on 24/7 or that are located in difficult-to-maintain places.

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**Student involvement**

This project will be visible to all students, faculty, and staff using the building. Plaques mentioning the Student Sustainability Committee will be attached to wall-mounted lighting controls. One or two student research assistants will take ownership of this project, to help manage the project in concert with F&S – this will provide a valuable and in-depth educational experience for these students.

Depending on the current state of the sub-metering project in progress across campus, a lighting sub-meter may be added to this proposal, to be tied into the F&S sub-metering project that provides data to the student body via the Illini Energy Dashboard. With an appropriate sub-meter in place, lighting and other energy-use data could be easily gathered and analyzed by students and used by faculty for class projects.

**Timeframe – start date and end date**

Lighting controls are relatively straightforward to install, however the locations for some of the sensors are high above the floor, and many are in classroom/studio spaces where installation schedules will need to avoid conflict with class time. The installation itself will require a few days of work by campus electricians. The specification and selection of the appropriate sensors and sensor location will require the input of the F&S lighting designer, which will likely require a number of months depending on schedule availability. If design decisions can be completed during the summer, installation could be completed at the end of the 2013 summer semester or early in the 2013 fall semester.

**Anticipated budget**

$63,000 fully funded. $20,000 high priority only. $48,000 high and mid-priority.

This pre-proposal uses budgeting installed-cost estimates of $1000 per occupancy sensor, $2000 per daylighting sensor, and $100 per LED exit sign. The items below are ranked high (H), medium (M), or low (L) according to priority, to provide options for partial funding.

3 LED fixtures for atrium ceiling: $1000 (L)
30 exit signs: $3,000 (H)
11 daylight sensors: $22,000

1. Exit stair W & vestibule can lights (M)
2. Exit stair S & vestibule can lights (M)
3. Entry hallway & stairs can lights (H)
4. Lvl 1 wall sconces (H) (or timer)
5. Lvl 2 wall sconces & restroom hall can lights (H) (or timer)
6. Lvl 2M wall sconces & restroom hall can lights (H) (or timer)
7. Lvl 3 wall sconces & restroom hall can lights (H) (or timer)
8. Atrium soffit can lights (H)
9. Atrium ceiling LED (replacement) (L)
10. Lower level can lights around atrium (M)
11. Faculty office hallway curve along atrium (H) (or timer)

37 occupancy sensors: $37,000

1. 5 review rooms (5 sensors) (H)
2. 3 seminar rooms (3 sensors) (L)
3. Computer lab (L)
4. Auditorium (2 sensors) (H)
5. 4 classrooms (4 sensors) (L)
6. 9 studios (18 sensors) (H)
7. 2 labs (2 sensors) (L)
8. 2 galleries (2 sensors) (L)