

## Student Weatherization Program Plan

### Overview:

The program's objective is to create a sustaining student weatherization program in which assessments of campus buildings are performed and reported by teams of trained University of Illinois students. Facilities and Services will review weatherization reports for project assessment and discussion with relevant teams.

Students will be trained to complete audits in order to obtain baseline data to provide Facilities and Services with recommendations for weatherization improvements. Audit data would be entered into Excel spreadsheets, for example, to allow for usability and ease of quantitative and qualitative analysis of results.

Audit areas could include building envelop, lighting, water, and waste. Follow up audits would need to be conducted to evaluate the program's success. Information from these audits could create a valuable body of information to guide future sustainability initiatives.

Details in the proposal are drawn from similar successful programs at the University of California at Berkeley and Colorado University at Boulder.

SSC funding could be utilized to:

- Provide for a student intern assist Facilities and Services in running the program
- Obtain training education and materials and tools as necessary for student assessors

Facilities and Services would provide funding for:

- Staff time for a member of either the Maintenance or Energy Services division to coordinate the program
- Weatherization materials and employees needed to implement improvements

Program Components:

### 1. Organization

A Facility and Services employee will be integral to the success of the project in coordinating, supervising, and implementing the program. This position could be housed in either the Energy Services division or Maintenance division, depending on available resources. The commitment would be expected to be less than ten hours a week; once training is done and the program is off the ground, the project should be a low time commitment for this employee.



While an official staff person will be necessary for the project's success, a student intern could be hired to conduct the majority of tasks needed for the weatherization program. Having access to a staff member's expertise and knowledge of navigating the University system and coordinating with workers and other campus groups provide will be essential to the project's success. After the program's first year, this student intern could be selected from the student group conducting assessments so as to possess helpful background knowledge of the program.

## 2. Training

The Building Research Council's Weatherization program would be the ideal source to provide students with the training necessary to conduct an assessment.. This organization is funded by a state grant to provide this type of training; if the time needed from the Building Research Council could be allocated to this, training could possibly be provided to students free of charge.

A second possible route to train students would be to utilize Facilities and Services staff to teach a group of students the fundamental aspects of building envelop, lighting, water, and waste auditing.

## 3. Building Selection

The focus in the first stage of this program would be converted residential units on campus, as suggested by Carl Wegel. These are frame structures and 1-3 story masonry buildings. Some examples of such buildings follow:

- The two converted houses east of Uni High on Springfield, used by Uni High
- The converted house on the northwest corner of Green and Goodwin
- The converted house southeast of ISR on the north side of Illinois
- 608 S. Matthews, 708 S. Matthews, converted houses along Nevada between Matthews and Goodwin
- Converted units along Oregon between Matthews and Goodwin
- Converted units on the south side of Nevada west of Lincoln Avenue

These buildings would be good candidates for several reasons:

- They are below the radar of F&S's formal retro-commissioning efforts.
- These buildings would be easy to manage due to their size; even simple improvements that student assessors could fairly easily identify could make a significant difference in the energy usage of these buildings.



A significant concern posed by the list of residual-converted campus buildings is that we understand these buildings may not be metered, which will pose difficulties in results assessment. Information on what buildings are metered and which would be good candidates for the project will be important to consider for eventual evaluation of the program.

#### 4. Focal Areas

Areas of focus to identify weatherization improvements through the student assessments could include the following. These are areas that could largely be easily, safely, and effectively implemented, although areas like plumbing and insulating steam pipes would require professional expertise.

- Weather stripping, sealing gaps in doors and windows, addressing common air leaks
- Caulking storm windows
- Installing low flow plumbing and water-saving faucet aerators
- Replacing light bulbs
- Installing door sweeps and door jambs
- Insulating steam pipes
- Adding smart power strips on computers
- Adding timers on water coolers

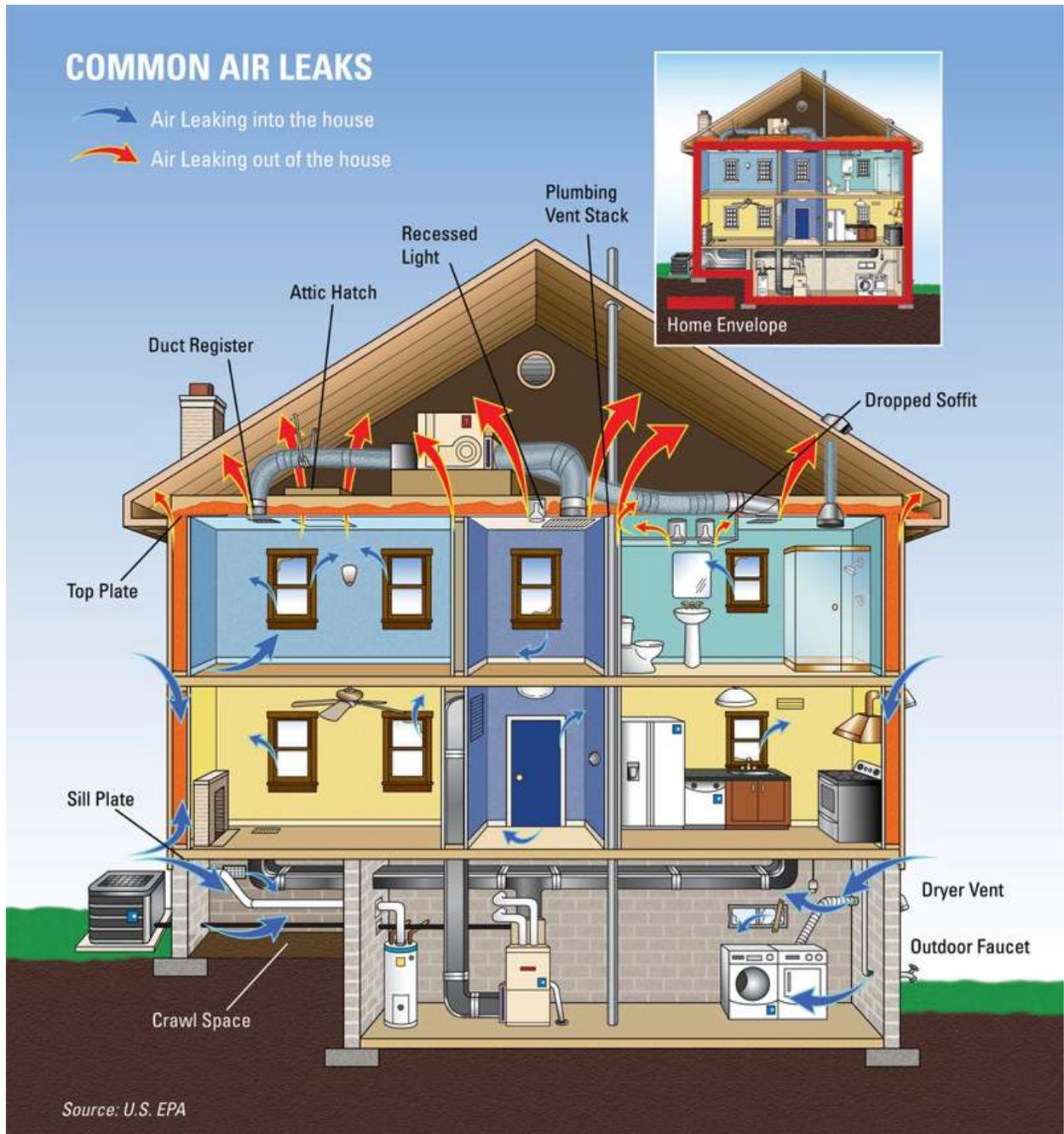
Main audit areas could be building envelop/heating and insulation, lighting, water, and waste.

An envelope audit would note the following, listed in general order of highest to least return. To start, the list could be limited to the first two items for greatest efficiency:

- Any open ducts, doors, windows, leaky weather stripping, etc.
- The model number, year, and efficiency of all hot water heaters and furnaces
- The R-value of insulation in the attics (if insulation is present)
- The R-value of the insulation in the building floors
- The R-value of the exterior wall insulation
- The presence or absence of double-paned windows in any room



The building envelope assessment might primarily examine the common problem areas diagramed below:





A lighting audit would note:

- The energy usage of all the lighting fixtures in a particular building or part of a building
- Fixture, bulb, and usage type to quantitatively measure energy consumption
- The quality and amount of light during the audit period

A water audit would note, using flow bags, drip vials, and fixture labels:

- An estimate of water usage in a building's restrooms

A waste audit would note:

- Weight of garbage generated
- Categorization of the different types of trash found in representative samples, possibly noting opportunities for separation, composting, etc

5. Implementation

Facilities and Services would allocate a portion of the building maintenance budget to implement recommendations that Facilities and Services deems appropriate.

6. Results Assessment

If possible, data on energy use for each building should be obtained prior to improvements so that information can be compared to identify cost and carbon savings.

For more immediate assessment of results, tools such as blower doors and thermal imaging cameras can be used to display the improvement in the building envelope. These resources could be accessed from the Illinois Sustainable Technology Center.

Conclusion:

A student weatherization assessment program would address a campus priority to improve buildings while also providing students with valuable knowledge and experiences. In order to assure that effort to obtain data through these assessments would provide value for campus sustainability, the proposal would need to be accompanied by formal support from Facilities and Services to give due consideration to results utilize the data as appropriate.

As this project would attend to a main concern of the SSC, priority would be placed on a funding proposal of this sort from Facilities and Services.