



STUDENT SUSTAINABILITY COMMITTEE

Funding Application – Step 1

✓Please submit this completed application and any relevant supporting documentation by the deadline listed on the SSC website to Sustainability-Committee@Illinois.edu. The Working Group Chairs will be in contact with you regarding any questions about the application. If you have any questions about the application process, please contact the SSC at Sustainability-Committee@Illinois.edu.

General Information

Project Name: Reducing bathroom water consumption: replacing high flow toilets with dual-flush (low flow option, 1.6/1.1 gpf) retrofit valve units on campus

Total Amount Requested from SSC: Designed as a proxy project, I project this project will serve to replace 1 or 2 floors of a given building on campus. Depending on the short list of potential candidate buildings, this number could vary from as little as 10 to as many as 60. Based on preliminary research (data from Facilities & Services, deferred maintenance projects from capital projects, and UIUC/UIS MEP Condition Assessments) and speaking with representatives from UIUC F&S, ISEE, and fellow graduate students, my leading building candidate is the Undergraduate Library (UGL). According to the UIUC Project Number U12151, Item 299852: There are approximately 64 fixtures (water closets, bathroom sinks, janitor sinks, and urinals) in the building. These were installed on 1/1/1969 and have an overall condition listed as fair. The estimated remaining years of life left are 5 years.

If allowed to continue to STEP 2, I anticipate conducting in-person assessments of the toilet units in all bathrooms in the Undergraduate Library, looking for the existing water flow rating and the exact number of units in the building. I also will measure the existing stem valves in place (distance from wall, length of neck, size of fittings) and use this information to verify replacement stem valves are able to be retrofitted (most are, from my experience with my previous project at UW-Madison (attached in e-mail with this document for reference). Additionally, I will conduct surveys of actual usage from students at visitors at the UGL. This effort has proven quite useful in estimating current and potential savings in water usage, carbon emissions, and utility costs based on real data. I anticipate measuring multiple 15-minute intervals of usage at various times of the day and for different days of the week (in order to account for variances in traffic and usage at the UGL).

An estimated 32 valve units to be replaced was based on the UIUC Project Number U12151 Condition Assessment. Of approximately 64 fixtures, I estimated toilet units likely comprise at most half of this. To further justify this, given the size and traffic flow of the UGL, I

independently estimated that there were likely 2 bathrooms on each floor (4 total) and at least 4 toilets per gender (8 units per bathroom) for a total of 32 units.

Project Topic Area(s): **Energy** Education Food & Waste
 Land **Water** Transportation

- Bolded instead of checked (couldn't do this on protected document)
 - I didn't select education, but I plan to incorporate an educational component to this project (explaining why this was proposed, the benefits of simple everyday changes, reducing carbon footprint, etc.). Another added point of emphasis: people will need educational materials within stalls to understand the respective direction of the intended flush (up for reduced flush, down for full flush).
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Contact Information

Applicant Name: Johnny Uelmen
Unit/Department: Pathobiology Department/University of Illinois Veterinary School
Email Address: uelmen@illinois.edu
Phone Number: 920-979-9888

Project Team		
Name	Department	Email
Johnny Uelmen	Pathobiology Department	uelmen@illinois.edu
Name	Department/Organization	Email Address
Name	Department/Organization	Email Address
Name	Department/Organization	Email Address

Project Information

Please provide a brief background of the project, the goals, and the desired outcomes:

This proposal continues from the momentum I've built as motivation from a very recently-funded sustainability proposal I submitted at the University of Wisconsin-Madison last semester. I study climate change and infectious disease as it pertains to not only humans, but also animals and the environment. I've always wanted to "practice what I preach" and reduce my carbon footprint. Last year, while working in my office, it dawned on me that the old building I was in so often (and ironically home to the center for the Office of Sustainability and the Global Environment) had only one very inefficient and outdated bathroom on the main floor. Every time I used this restroom, I became bothered by how much energy and water I was consuming ...and I was only one of many men who frequented this restroom daily. It was then that I knew I had to try to make a change.

After calculating some estimations based on my usage alone in that one dilapidated men's restroom, I became excited to see just how much energy and water my university could save if spread across multiple, busier bathroom facilities. To make a long story short, my idea (and promising calculations) caught on with the University of Wisconsin Housing Department and the Office of Sustainability's newly-established Green Fund. The idea was simple: find outdated, high-flow toilet units and convert them into low-flow, highly-efficient units. Luckily, the implementation was also simple: retrofitting the valve stems is all that needed to be done, despite have existing toilets 30+ years of age.

I recently transferred to UIUC (3 weeks ago) and wanted to continue my trajectory for making my campus a more sustainable place. After meeting with F&S, ISEE, and SSC representatives, my idea is absolutely feasible for implementation at UIUC. Designed as a small project in its first phase, the main goal is to establish a baseline water usage for the proposed campus building (to be determined) and record the reduction in water use after 1 year. Each building has recorded water use, but not all is used for restroom facilities. Installing a meter on the cold water mainline would accommodate the water that is allocated to restroom fixtures (sinks, toilets, urinals, etc.). If funded, the difference in water use after 1 year would be attributed to the intervention, or implementation of the newly installed low-flow toilets (assuming we have a similar volume of students visiting and using the restrooms year to year).

The desired outcomes are promising. For my UW-Madison Green Fund proposal, I recorded 15-minute interval of men and women bathroom use at various campus buildings at different times of the day and days of the week. This data formed the basis of my estimations for baseline use and potential savings after intervention. My project is funded to replaced 67 valve stems on the toilets in one dormitory on campus and estimated to save UW Housing \$50,897 in utility costs as well as reduce 8.5 million gallons of water and 1.03 million pounds of CO₂-equivalent greenhouse gases annually. If implemented at the UGL, for example, I expect these values to be even greater in savings (per unit) given the number of students the building serves (greater than a single dormitory per day).

Please provide a brief summary of how students will be involved in the project:

The most immediate involvement will be from the end result of the project itself – using highly efficient and hygienic toilet units in a student-oriented, focused, and highly-used undergraduate building. I myself am a new transfer student to the UIUC and anticipate being the lead on overseeing the design, calculations, and implementation of this project. Although not in detail, I would like to have a team of undergraduate students serve as ambassadors to the project, providing high quality education materials both on the doors of the bathrooms and on each accompanying stall that would explain benefits towards replacement of these units, the impact on campus and the environment, and being conscious of one's carbon footprint.

Please provide a brief summary of the project timeline:

- April-May 2018: Contracting with labor personnel and ordering/acquiring all toilet retrofit stem valves
- Summer 2018: Project begins. For reference, UW Housing estimated that their contracting plumber could install one retrofit valve in about 1 hour. Assuming 1 hour per unit = 32 hours of retrofitting the valve units + 2.5 hours to install a meter on the cold water mainline to the building = 34.5 total hours of work. Summer is selected as the time to conduct this work order as the majority of undergraduate students are on break and off campus, not utilizing the UGL.
- August 2018: All units and cold water mainline meter installed and fully functional.

Additional comments:

Prior to moving forward and writing this proposal for the Step 1 application process, I met with Morgan White and Catherine Liebowitz on separate occasions to discuss my most recently funded sustainability project (proposed last semester at UW-Madison) and whether something along these lines would be feasible at UIUC. In summary, I have the support of F&S and feel confident I have the necessary resources and knowledge-base for a strong Step 2 application.

Please feel free to review my previously funded "Green Fund" sustainability project from the University of Wisconsin's Office of Sustainability. This was only the 2nd student-led project to be funded at UW-Madison and is designed to replace all toilet units in an entire dormitory on campus. UW Housing and Facilities is strongly supporting it and sponsored all labor costs. They anticipate this project to be very successful and will implement campus-wide toilet replacements in the near future (if results are promising after 1 year).

As stated earlier, I will design this proposal to be a proxy for a larger project for next year. Similar to my UW-Madison proposal concept, I would like to take 1-2 floors (and in this case, that would equate to the entire UGL building) and monitor the progress after 1 semester (or 1 year if that is preferred). Based on the results, this would provide further justification and

assurance to the SSC that we could replicate the projects in other buildings, saving thousands of dollars each year.



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Appendix

Estimation of expected budget for ~32 new toilet units

Budget Item	Green Fund Request	Outside Grant/Rebate	Total	Explain how you arrived at this cost estimate and your sources of information
Zurn AquaVantage AV Z6000AV-DF 1.6/1.1 Flush Valve	\$197 x 32	This is something I'd love to look into. Is anyone aware if UIUC can get discounted rates (especially for large orders)? I can also talk to Zurn Products Manufacturers/ Distributers and see if we can negotiate a discounted rate.	\$6304	Estimate provided by Mike Henry; number of units provided by UW Housing Building Manager of Tripp and Adams Hall
Water flow meter	\$250 x 1		\$250	This is a previous estimate provided by UW Housing Director Mike Henry; this unit would be for monitoring the building's cold water mainline used specifically for bathroom water fixtures (sinks, toilets, urinals, etc.).
Labor to procure/install toilets	\$95/hr		\$3040	Again, estimate is from University of Wisconsin physical plant staff (1 plumber contracted to replace 1 unit per hour @ \$95/hr) = 32 x \$95 = \$3,040
Labor to install water flow meter	\$250		\$250	Estimates provided by Mike Henry, based on ~2.5 hours of labor for one flow meter
Labor to educate residents	\$500		\$500	This cost is estimated to cover high-quality printing material, lamination, and education pamphlets, newsletters, etc. for proper use and benefits of dual-flush units (and project in general)
Labor to coordinate the project	\$0		\$0	If funded, I would lead this project; I would be happy to put these materials together, coordinate the project, while I am a student at UIUC.
TOTAL	\$10,344		\$0	\$10,344