



## Expanding Solar Energy at Longwood

*How might Longwood implement solar energy on campus and encourage faculty, staff, and students in its use?*



Solar energy is electricity produced from the light of the sun, rather than burning fossil fuels that contribute to global warming. Large institutions such as Longwood university have a responsibility to commit to reducing their impact on the environment, something solar would help achieve. Longwood's current solar power comes from two solar umbrellas on Brock Commons, capable of charging phones using solar power stored in a battery in the umbrellas' bases.

### SOLAR UMBRELLAS

The umbrellas' batteries charge with five hours of sunlight and hold enough power after dark to charge fifteen phones<sup>21</sup> In full use during the academic year, these umbrellas potentially could supply between 20 and 25 kWh of power each, only between 0.0001% and 0.0002% of campus electricity use<sup>2</sup>. Though these numbers may be small, these solar umbrellas are important for engaging students in using solar energy.



Top: a solar umbrella on Brock Commons.  
Bottom: a USB port on the base of the umbrella.

### Solar Umbrellas

- charge three phones at once
- work at night
- supply 2.1 amps to devices over USB
- charges up to 15 phones before needing a recharge

### MOVING TOWARDS SOLAR

In an interview with Energy Manager Kevin Miller, we learned that Longwood already has solar panels but hasn't yet installed them! However, he notes that pressure from students, particularly through the Student Government Association, is very effective at getting things done. Longwood also has plenty of flat roof space to put solar panels on.

### Did You Know?

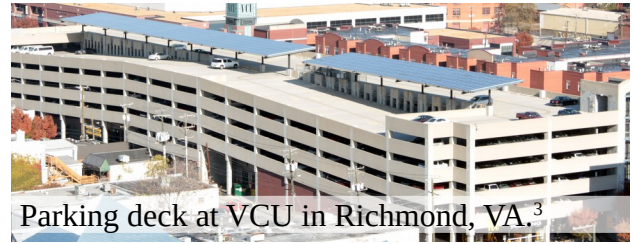
Longwood has had solar panels in storage for SEVERAL YEARS, but has yet to install them!

<sup>1</sup>According to the ZON website, these umbrellas' batteries have 160 watt-hours of electricity. Calculation assumes a phone battery operating at 3.8 volts with a 2600 milliamp-hour capacity (specs of an iPhone 9).

<sup>2</sup> Further extrapolation assuming fifteen phones charged per day, every day class is in session, over two semesters and the 17.5 gigawatt-hour annual power consumption figure provided by Kevin Miller.



Solar Garden concept from Longwood's own Energy Manager Kevin Miller.



Parking deck at VCU in Richmond, VA.<sup>3</sup>

### Possible Solar Concepts

Top left: The top left image shows a fully 3D designed proposal for a solar garden in front of the Dining Hall. A solar panel would charge batteries which would power plugs to charge mobile devices and at night, indirect lighting.

### Other Universities

Top right: This image shows a solar array atop a parking garage on VCU's campus in Richmond, VA. Rooftop solar arrays and solar arrays over parking lots are two concepts Longwood might consider..

Bottom left: The Princeton University Art Museum owns two Low Speed Vehicles (LSV) charged by solar panels for travel around town and on campus. These are similar to Longwood's golf carts, but are more environmentally friendly.



Solar Powered LSV at Princeton University<sup>4</sup>

### Summary

The solar umbrellas on Brock are a start, but Longwood needs to do more. The university has many buildings with flat roofs ideal for solar panels, and has been sitting on a small array's worth of panels for several years. Many faculty and staff members, including Longwood's energy management team and staff at the library (the campus's largest energy consumer), are eager to see solar power implemented on campus. Student pressure, particularly through the Student Government Association, has worked quickly and effectively at seeing issues addressed by the university; such an effort will be necessary to bring solar to Longwood.. **Student and faculty/staff communication and pressure is what Longwood needs to see solar power come to campus on a large scale!**

### Future Steps

- ✓ encourage communication between departments at Longwood interested in solar and energy management
- ✓ engage students to push for solar energy at Longwood
- ✓ assess resources at Longwood and begin planning for incorporation of solar

<sup>3</sup><https://sustainability.vcu.edu/operations/resource-use/solar/>

<sup>4</sup><https://sustain.princeton.edu/news/art-museum-solar-powered-vehicles>