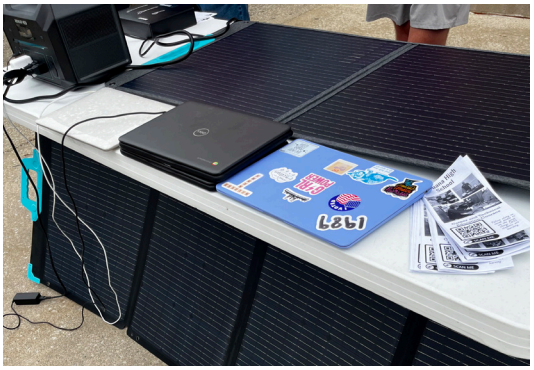
ILLINOIS GREEN SCHOOLS

URBANA HIGH SCHOOL

PATH TO NET ZERO ENERGY AWARD WINNER



THE PROJECT: ENERGIZING THE ENGINEERING CLUB

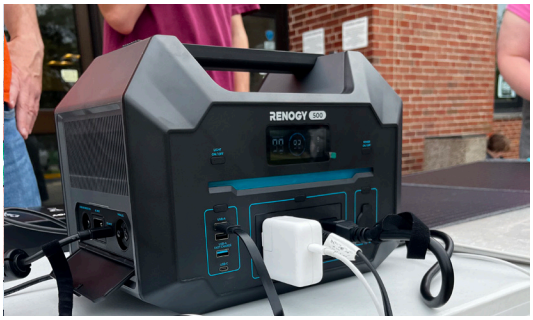
Understanding that equipping a school with a solar array is a lengthy and expensive process, the Urbana High School Green Team—made up of students from the Engineering Club—focused their year's work on collecting information and educating students and staff on their school's energy usage and the potential benefits of renewable energy. They performed an audit of their engineering lab classroom and shared their findings with the school through hands-on demonstrations with a solar-powered charging station. As folks charged their devices, the team engaged in conversation about alternative energy.

Project Type: Energy
Students Involved: 5
Staff Involved: 2
Location: Urbana
Grade Levels Involved: 9-12th
Number of Students Impacted: 25

> Our approach is to educate the student and staff body in order to inspire change across the school, by demonstrating use of solar and spreading awareness. While small in scale, even as simple as charging personal devices, anyone is able to recognize the value of green energy.
>
> - Nathan Westerman

PROCESS

To perform their energy audit, the Green Team's Green Schools Mentor, Matt Johnson of Elara Engineering, outlined best practices and helped the team design an audit spreadsheet which logged the types of devices being used, typical usage, the wattage of each device, and the amount of time each device actually runs relative to the amount of time it's plugged in. They generated data for each device's yearly energy use, an estimated annual cost for each device's energy use, and the annual CO2 emissions of that energy use. They found that their school's engineering lab alone used 6,880 kWh/year, with an estimated cost of $757/year, and an estimated annual CO2 emission of 11,008 lbs.



Plug Load Example

Existing

Average Electricity Cost = $ 0.11 per kWh Average CO_2 Emitted per kWh = 1.6 lbs

1	2	3	4	5	6	7	8	9	10	11
Equipment1	Quantity In Use2	Typical Use, Hours/Day	Wattage	Cycle Time3	Monthly kWh5	Months/ Year6	Yearly kWh	Annual Cost Each	Total Annual Cost	Annual CO2 Emissions (lbs)
Desktops	20	24	209	8%	144	6	864	$4.75	$95	1,383
Monitors	40	24	69	100%	990	6	5,760	$15.84	$634	9,216
3D Printers	3	24	120	8%	17	6	104	$2.28	$11	166
LED Ceiling Lights	38	2	15	100%	22	6	130	$0.40	$14	207
HP Printer	1	0.33333	579	100%	4	6	23	$2.51	$3	36
					-	9	-	#DIV/0!	$0	0
					-	9	-	#DIV/0!	$0	0
					-	9	-	#DIV/0!	$0	0
					-	9	-	#DIV/0!	$0	0
					-	4	-	#DIV/0!	$0	0
					-	4	-	#DIV/0!	$0	0
					-	4	-	#DIV/0!	$0	0
					-	12	-	#DIV/0!	$0	0
TOTAL					1,147		6,880		$757	11,008

Notes:
1. If necessary, change input in yellow for equipment you are analyzing. You can change other numbers as needed.
2. Quantities shown are for a typical, 25-classroom, 100,000 sq.ft., K-12 school.
3. Amount of time the appliance actually runs (e.g., a coffee maker burner is only on ~33% of the time)
4. Laptop wattage denotes when tablet or notebook is on and charging. A fully charged battery will yield less wattage.
5. The number of days per month an item is used has been adjusted where applicable. For example, the digital

OUTCOMES & IMPACTS

Through their classroom energy audit, the students developed a deeper understanding of the energy required to run a school building. They also discovered that there are many simple ways to reduce their school's energy consumption, like unplugging devices that aren't in use and influencing the energy conservation practices of others in their school community. Their goal for the future is to continue educating students about their impact through solar power demonstrations, build widespread support for sustainable energy practices, and eventually persuade their district and board members to invest in a solar array for their roof.