SAR ENERGY TEAM 2022

FINAL PRESENTATION

OVERVIEW

- Guiding Questions
- Methodology
- Results
 - Data Analysis
 - EDI
- Cost-Benefit Analysis
- Conclusions





GUIDING QUESTIONS

Does changing the temperature of the HVAC units in the Rieber Vista lounges significantly change energy use? Is there a difference in energy usage between a more efficient HVAC system (Centennial Hall) and a less efficient system (Rieber Vista)?

How can we promote energy equity on the Hill and a greater focus on sustainability during housing remodels?



HVAC system of Rieber Vista 9th floor lounge

METHODOLOGY: ENERGY USE DATA ANALYSIS





Initial audit- Building walk-throughs

-Walk-throughs of Rieber Vista and Centennial Hall -Interviews with building engineers.

Collecting data- data loggers

-Collaboration with UCLA Housing Maintenance -energy data loggers in Rieber and Centennial lounges -Separate data loggers for indoor and outdoor air temperature and humidity. -set temperatures changed weekly



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	E	G	н	1	J	К	L.	м
- Week	Ŧ	Indoor Temp 🐨	RH, % 🐨	Outdoor Temp,*F 🐨	Outdoor RH, % 🔫	KWh (3 Phase System Total) $ vert$	Base Temp (🐨	Cooling Deg
	1	67.586	58.557	51.721	95.649	0.021	68	
	1	67.627	59.261	51.678	95.997	0.021	68	
	1	67.372	58.752	51.633	96.142	0.021	68	
	1	67.114	58.851	52.378	96.556	0.021	68	
	1	66.985	59.174	52.686	96.147	0.021	68	
	1	66.857	59.406	52.817	95.812	0.021	68	
	1	66.772	59.55	53.166	95.1	0.022	68	
	1	66.772	59,793	53.384	94.724	0.022	68	
	1	66.643	57.194	60.647	69.368	0.021	68	
	1	66.814	56.872	61.804	67.333	0.021	68	
	1	66.985	56.58	62.019	67.062	0.021	68	
	4	67.242	56.632	62.704	66.25	0.395	68	
	67.5	56.439	63.048	66.107	0.395	68		
		67.714	56.088	63.475	65.057	0.024	68	
		67.971	55.925	63.648	65.133	0.418	68	
		798	55.51	63.775	64.702	0.392	68	
			53.855	63.775	64.672	0.407	68	
			55.593	63.775	64.998	0.419	68	
			55.559	63.775	65.825	0.24	68	
			145	64.161	65.892	0.185		

Analyzing data-**Google Sheets**

-Joind data in Google Sheets -Created visualizations.

METHODOLOGY: ENERGY EQUITY

Petition

Petition Goals: greater transparency in building remodels creation of a sustainability position on building remodel board





Focus Groups

-Focus groups with 3 Living Learning Communities. -Questions related to experiences with energy on the Hill and how energy equity can be improved.

RESULTS

Temperature Set Points

- Our study found that there is a moderate positive correlation between cooling degree days and HVAC system energy use (r = 0.5)
- Similarly, our study found a moderate positive correlation between heating degree days and HVAC system energy use (r = 0.5)



12 10 Daily Sum of HVAC Energy Use (KWh)



Daily Heating Degree Days vs. Daily HVAC Energy Use (KWh)

SUM of KWh (3 Phase System Total) — 0.175*x + 0.182 R² = 0.244



Daily Sum of Heating Degree Days



RESULTS

Centennial vs. Rieber Vista Comparison

• Centennial 8th Floor Lounge used 40% less energy than the Rieber Vista 8th Floor lounge.

0.000125 Use (KWh/SqFi 0.000100 0.000075 Energy 0.000050 お erage 0.000025 0.000000



RESULTS: ENERGY EQUITY

EDI Focus Groups

- Access to air conditioning is directly based on income
- Older buildings do not have consistent energy supply
- Older buildings have poor building insulation, leading to excess warmth in the summer and cold in the winter

Recommendations:

- Access to AC for all students on the Hill
- Preventative updates to fixtures
- Increase outlets in dorm rooms
 - Provide free extension cords and power strips for students to rent





COST-BENEFIT ANALYSIS

Degree Days

where the average daily temperature is above 65F (cooling) and below 65F (heating)

- KWh/Degree Days = Normalized KWh for Reiber Vista
- Energy cost/DD: \$0.165 Cooling \$0.039 Heating \$0.047 Combined
- Carbon cost/DD: \$0.062 Cooling \$0.015 Heating \$0.018 Combined
- Total cost/DD: \$0.228 Cooling \$0.054 Heating \$0.064 Combined









- A. Petition
- B. Student Recommendations
- C. Housing Recommendations



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Future SAR Suggestions

- Petition implementation
- Sustainable building remodel role as a SAR stakeholder
- Place LLCs at forefront of equitable energy resources





A Special Thank you Spencer Middleton

Stakeholder - Facilities Management Energy Analyst

Jared Meyer

Senior Director of Housing Maintenance

Bill Gonzalez

Electrical Shop Manager, HHS Maintenance

William Herrera

Lead Operating engineer

Todd Lynch

Green Building Specialist

LLC's

Afrikan Diaspora Chicanx/Latinx Philipinx



THANK YOU

Please sign our petition for a sustainable advocate!





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SCAN ME

