



2024 Better Buildings SUMMER WEBINARS

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U.S. DEPARTMENT OF
ENERGY



Building Owner Spotlight: Smarter Small Buildings Campaign

July 30, 2024

11am –12pm ET



Nora Hart

Lawrence Berkeley National Laboratory

Agenda

1 Welcome and Introduction

2 Polls

3 Speaker Presentations

4 Q&A and Wrap up

Today's Presenters



Nicky Arthur
LUSH



Marcos Rodriguez
Bakersfield College



Levi Love
Sheetz Inc.

Please go to www.slido.com

using your mobile device, or by opening a new window

Enter Event Code

#DOE

Smarter Small Buildings Campaign

Overview

- ▶ DOE-sponsored program launched in Summer 2023, managed by Berkeley Lab to promote improved HVAC controls
- ▶ Applicable to all small/medium commercial buildings with packaged rooftop unit HVAC

Why Small Buildings?

- ▶ 94% of commercial buildings are less than 50k sq. ft. and only 5% of those buildings have smart thermostats.
- ▶ Opportunity to save 10-20% on energy consumption, improve occupant comfort, streamline maintenance and extend equipment life.

[SmarterSmallBuildings.lbl.gov](https://www.lbl.gov/SmarterSmallBuildings)



Smarter Small Buildings

Join as a Participant

Building owners and operators

Goal: Provide owners/operators with technical assistance, peer exchange, and recognition opportunities.

Join as a Partner

- ▶ Product vendors, contractors, industry organizations, utilities
- ▶ Goal: Collaborate with partners to seek broader solutions to market barriers restricting scaled deployment of improved RTU controls.



SmarterSmallBuildings

Campaign Updates

30 PARTICIPANTS

Building owners,
operators

75 PARTNERS

HVAC controls
vendors, contractors,
industry organizations,
utilities

**NEW
RESOURCES**

Product selection
guidance, case
studies, webinars

Technical Assistance Categories & Examples



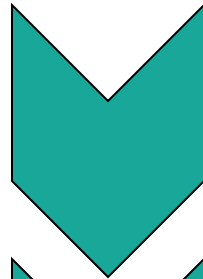
Can you share information on energy meters for small retail spaces where we do not have a dedicated electricity account?

Can you provide some details on the expected energy savings from controls so I can make the business case to leadership?

How can I measure the indoor air quality of my buildings?

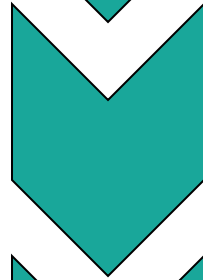
Technical Assistance Example: How do we select a controls vendor that will meet our needs?

Participant signs up for the campaign.



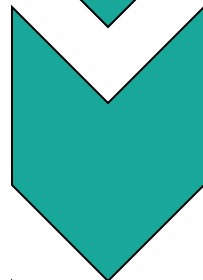
Campaign intake call to determine how participant currently manages small buildings.

Participants works with stakeholders to determine their requirements for the controls solution.

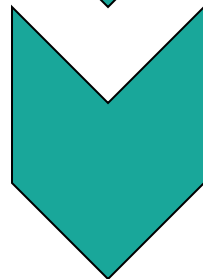


Give participant overview of product selection guidance.

Participant sends list of requirements to control vendors to determine if they comply.



Review participants list of requirements and provide suggestions.



Follow-on support such as attending vendor demos or reviewing vendor proposals and providing feedback.

Polls

We'd like to learn more about you!

Please go to www.slido.com and enter code **#DOE** to respond

Smarter Small Buildings

Recognition Recipients



LUSH
Nicky Arthur
Energy Management
& Sustainability
Specialist



Bakersfield College
Marcos Rodriguez
Executive Director, Facilities &
Operations



Sheetz
Levi Love
Manager of Energy
Procurement & Analytics



Nicky Arthur
LUSH

Operations & Maintenance - Lush

Quick Facts

Controls Provider	Powerhouse Dynamics
Project Location	LUSH Stores
Building Type	Retail
Average Building Size	1,687 ft ²
Buildings With Controls	183
Average Energy Saved	17% Electricity





LUSH FRESH HANDMADE COSMETICS



NAKED
PRODUCTS



FIGHTING
ANIMAL
TESTING



FRESH
COSMETICS



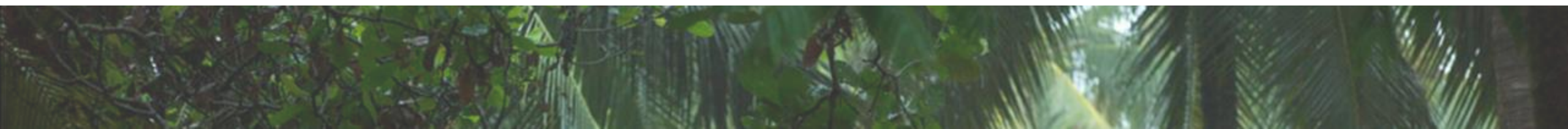
100%
VEGETARIAN



ETHICAL
BUYING

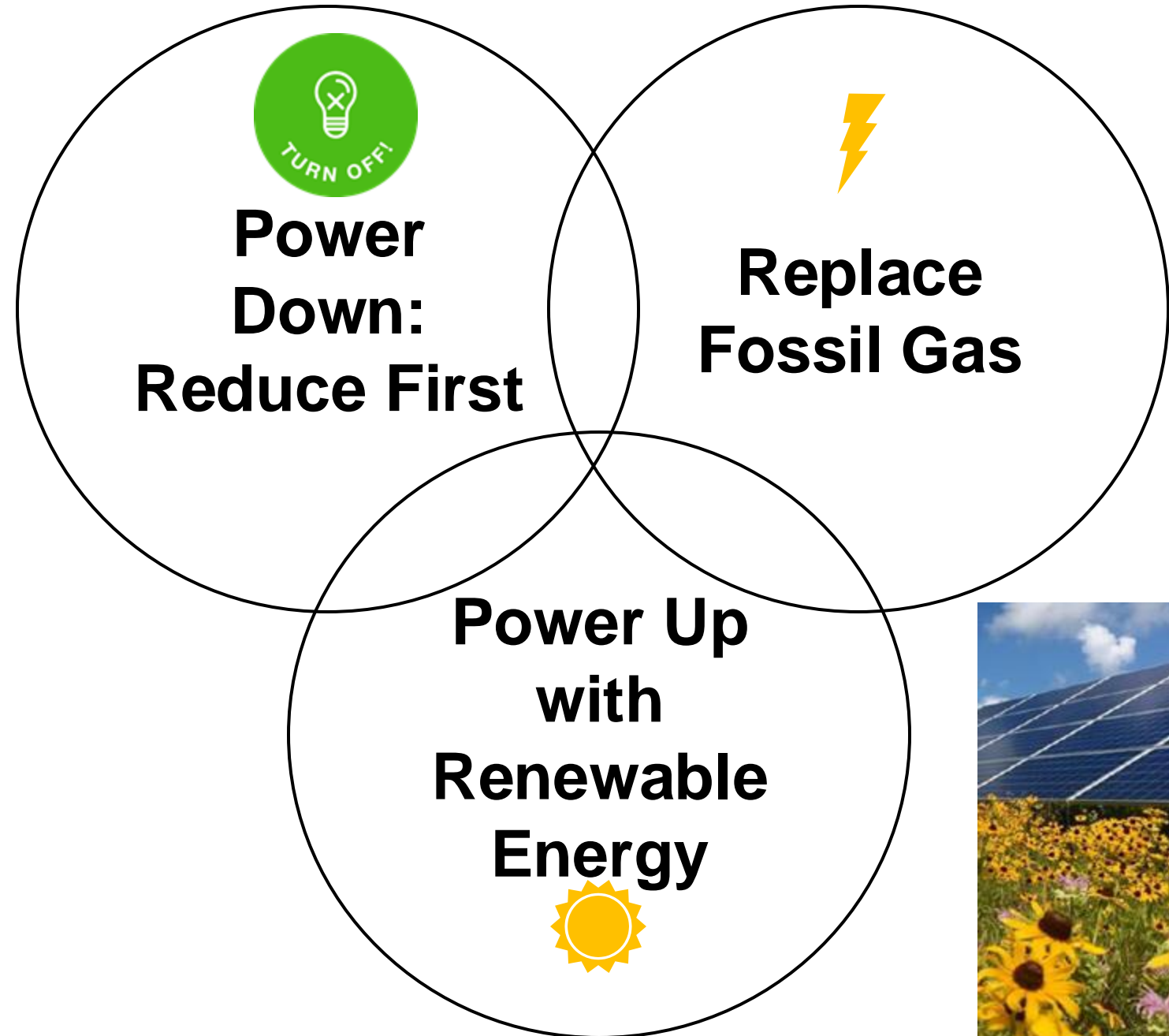


HANDMADE
WITH LOVE





**100%
Renewable
Power
Everywhere**



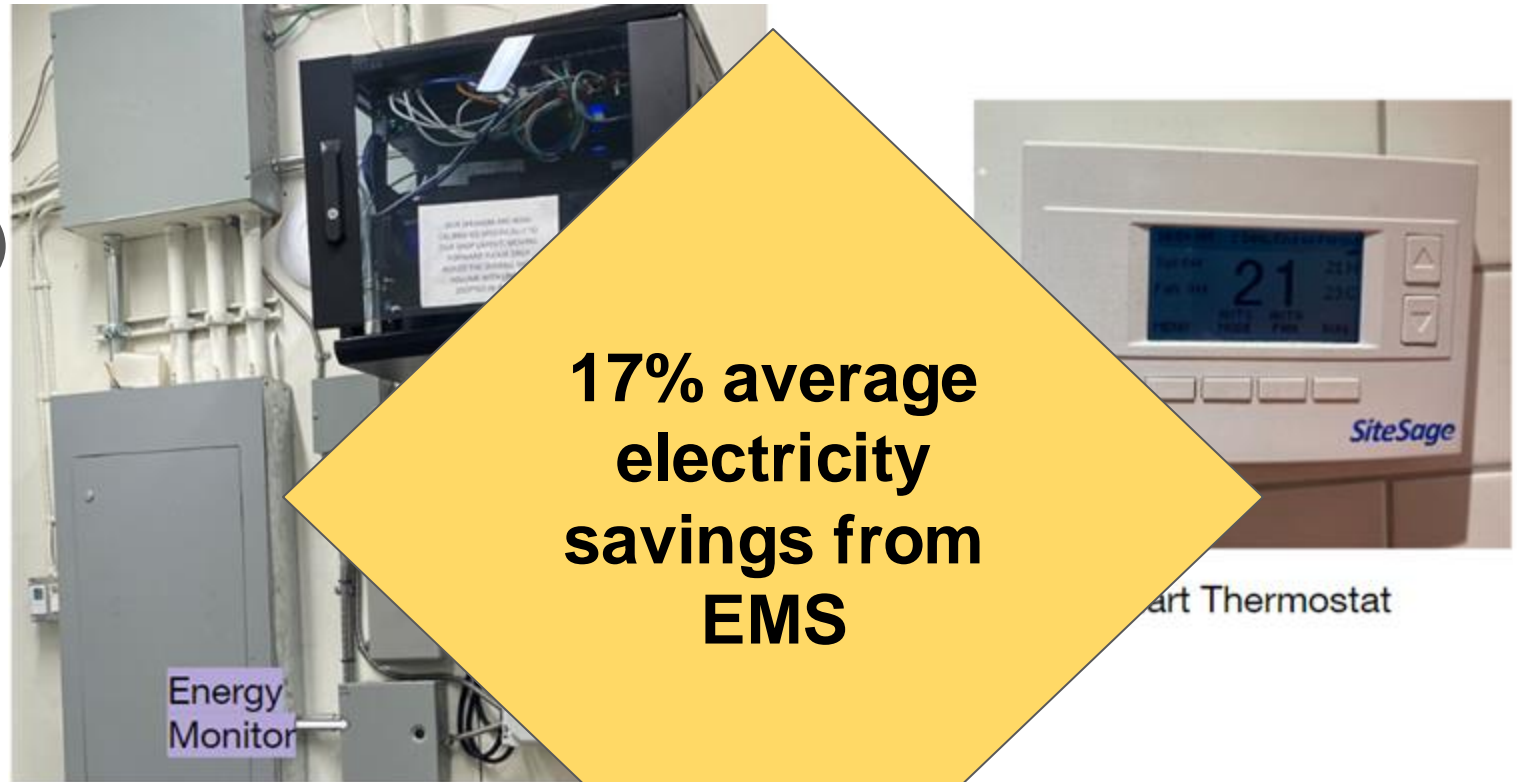
Lush & SiteSage - Project Description

Controls

- Exhaust fans
- Heating & Cooling schedules (smart TStats)
- Lighting

Measurement

- Electricity usage
- Water usage
- Maintenance alerts and information
- Equipment trend logs



**17% average
electricity
savings from
EMS**

Smart Thermostat

SiteSage System - Schedules and Setpoints

Adjust Schedule: RTU 1 Cash Register

Basics Periods **Heating** Cooling Local Lock-out

Schedule Monday ⓘ

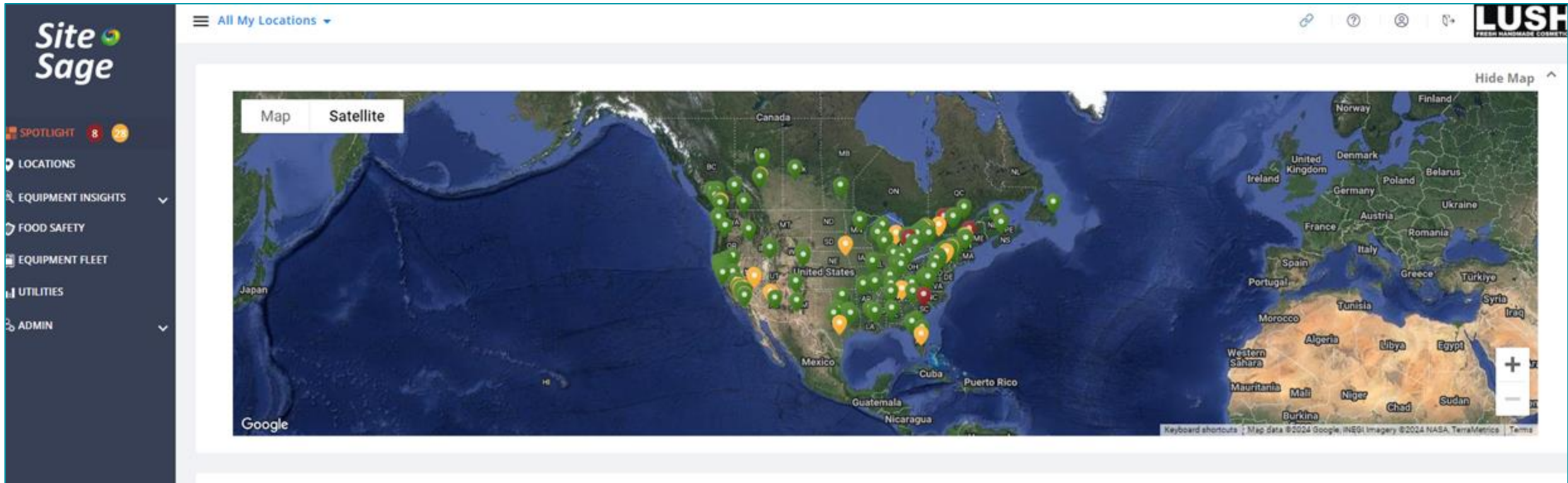
Drag the bars horizontally to adjust the time periods;
Drag the bars vertically to adjust the temperature settings

State	Temperature (°C)
Closed	17
Pre-Open	19
Open	21
Pre-Close	19

Fan Mode

Closed Auto On Pre-Open Auto On Open Auto On Pre-Close Auto On

Lessons Learnt - Communication



The system is only as good as the people using it!



Marcos Rodriguez
Bakersfield College

Equity – Bakersfield College

Quick Facts

Controls Provider	Johnson Controls
Project Location	Bakersfield College
Building Type	Education
Average Building Size	20,500 ft ²
Buildings With Controls	Welcome Center



Welcome Center Modernization Project



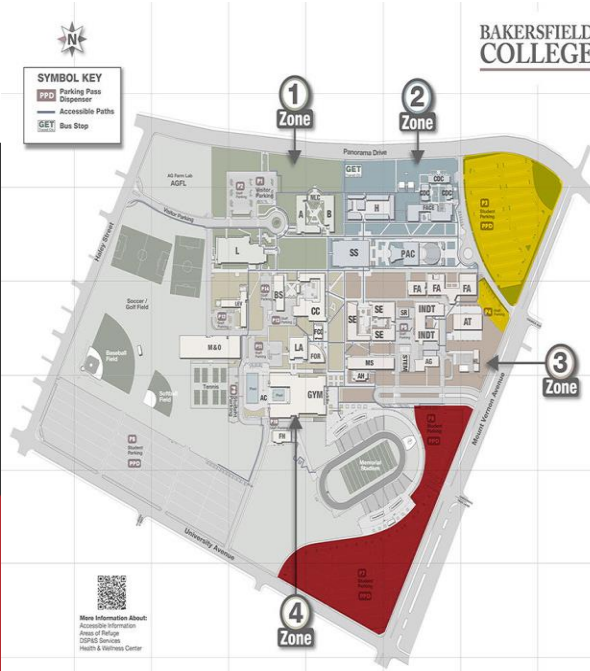
Marcos A. Rodríguez

*Executive Director for
Facilities & Operations*

Administration Building: 1955 - 2020



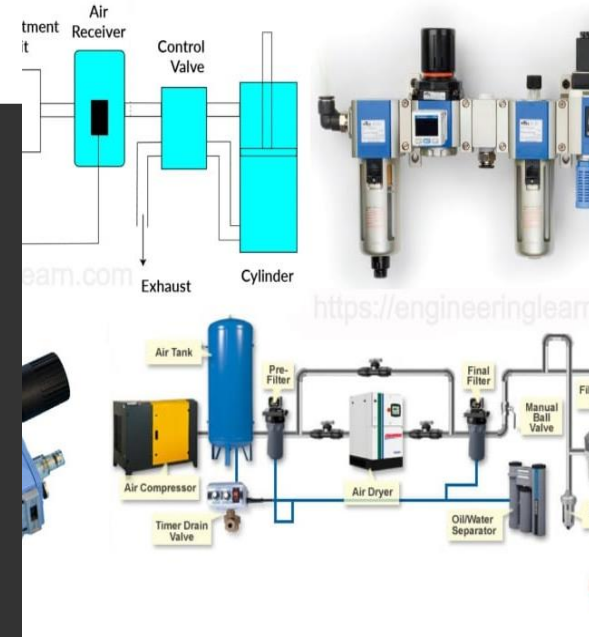
Campus Opens
1955



Front of School
Admissions & Records
Human Resources
President's Office



Complete Modernization
Renovation



Pneumatic Controls
Cooling Capacity Limitations



Welcome Center June 2023

- Passive Solar Design
- Direct Digital Controls – Energy Management & Control System for HVAC and Lighting
- Building Is Partially Cooled Using a Thermal Energy Storage Tank System
- Windows Replacement & Insulation Throughout the 9,800 ft² Building
- \$9.8 Million Project Cost

Thermal Energy Storage Tank System

System Mode	Cool Mode	●
Charge Mode Enable	Off	●
DisCharge Mode En...	Off	●
Low Ambient Bypass	Off	●
Tank Water Level	80.9 in	●
Pump Flow Meter	2.4 gal/min	●

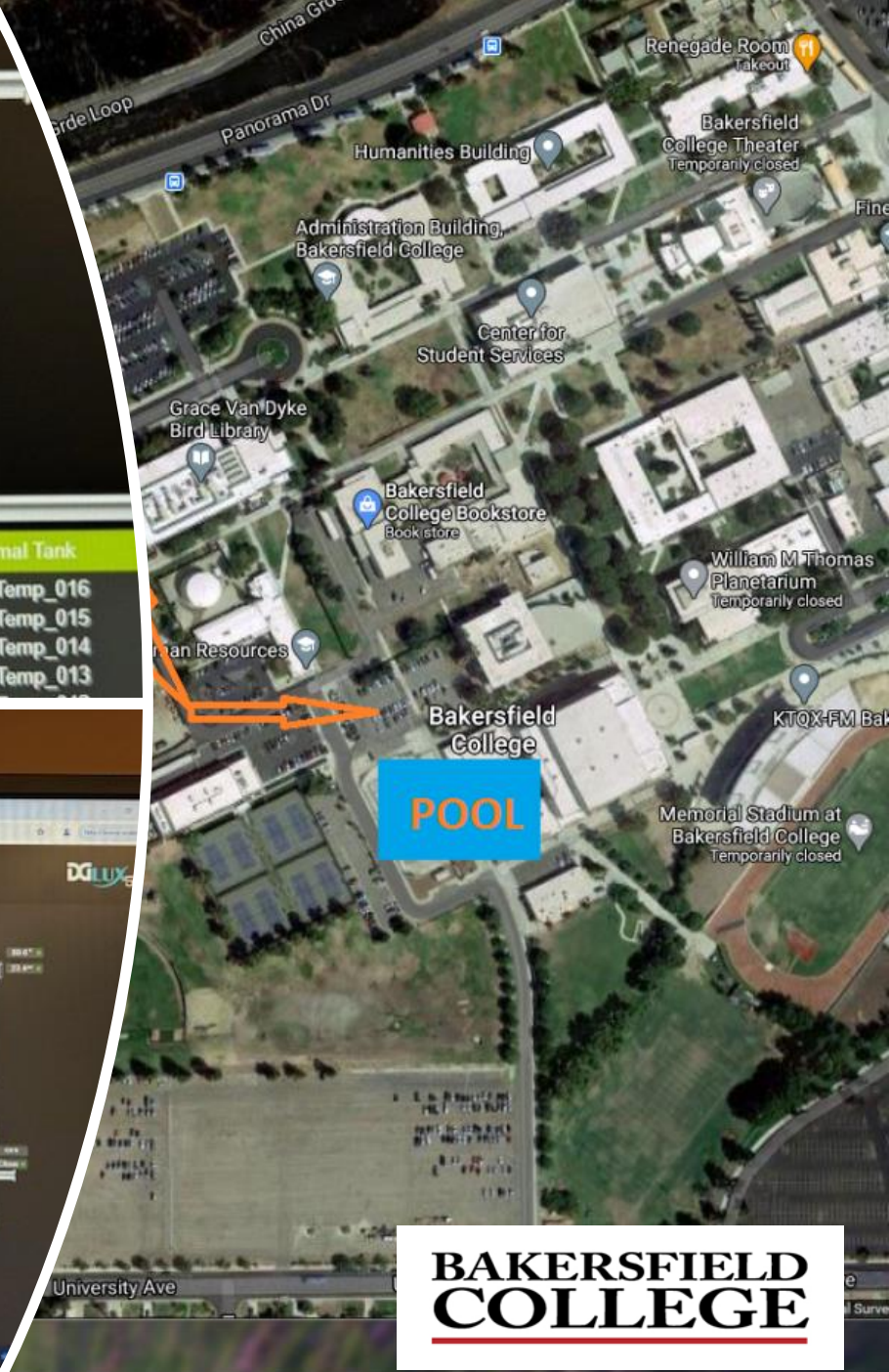
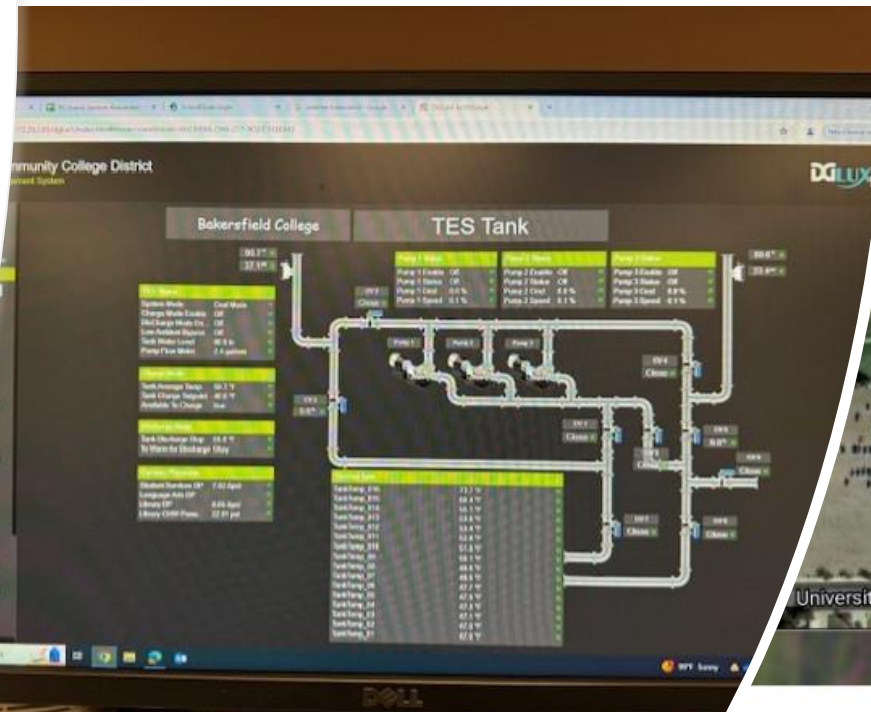
Charge Mode		
Tank Average Temp	50.7 °F	●
Tank Charge Setpoint	40.0 °F	●
Available To Charge	true	●

Discharge Mode		
Tank Discharge Stop	55.0 °F	●
To Warm for Discharge	Okay	●

Campus Pressures		
Student Services DP	7.65 Δpsi	●
Language Arts DP		●
Library DP	8.11 Δpsi	●
Library CHW Press.	21.85 psi	●

Thermal Tank	
TankTemp_016	
TankTemp_015	
TankTemp_014	
TankTemp_013	

Name: TankChargeSP
Value: 40.0 °F



Energy Management Control Features



Sixteen VAV Boxes



Keep Staff Happy & Manage Energy Wisely

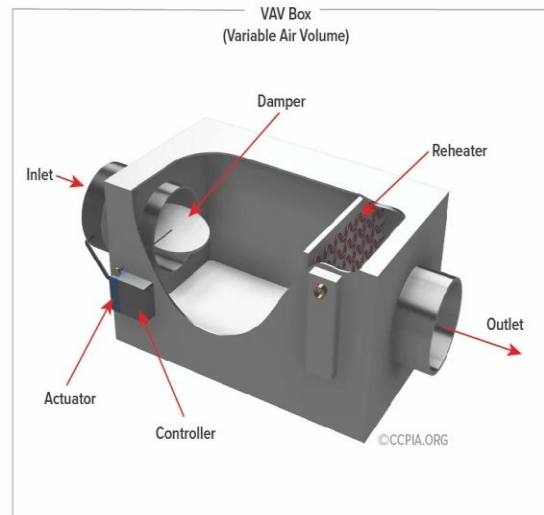
Miscellaneous Systems

Variable Air Volume

Occupant Controls

End User

Two Air Handlers
Three Fan Coils
One Split Duct Unit



Each VAV Zone Has A Thermostat Control With +/- 3° F Adjustment

System Temperatures Stay In Set Temperatures Until Changed



BAKERSFIELD COLLEGE



The Result

Building Set Point Default to 70°F

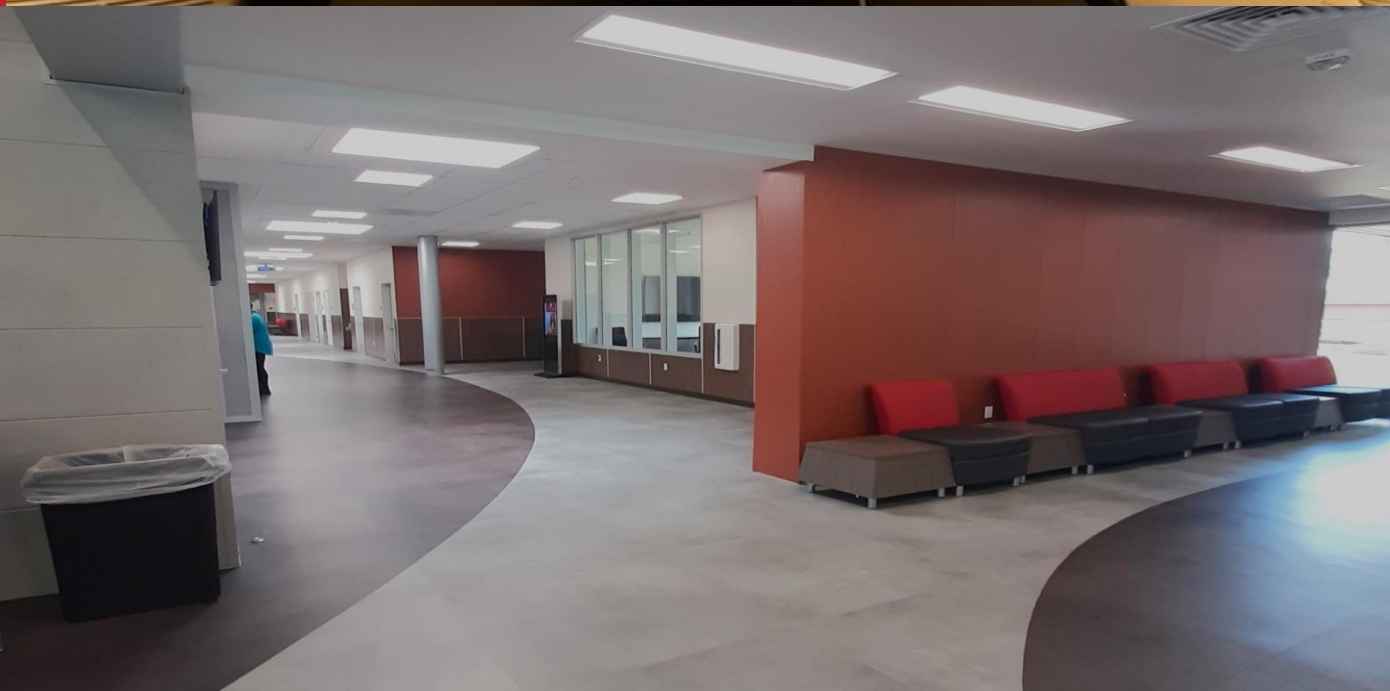
Exhaust Now Operate On Static Pressure

TES Tank Goal Is Set To Cool Down To 39°F

TES Tank Shuts Down at 55°F

Chiller Plant Automatically Turns On

Cooling Capacity Has Doubled Since The
Original Construction In 1955





Levi Love
Sheetz Inc.

Quick Facts

Controls Provider	ALC-WebCTRL
Project Location	Mid-Atlantic
Building Type	Convenience Store
Average Building Size	6,000 ft ²
Buildings With Controls	700
Average Energy Saved	11% whole building



Sheetz, Inc. HVAC Audits

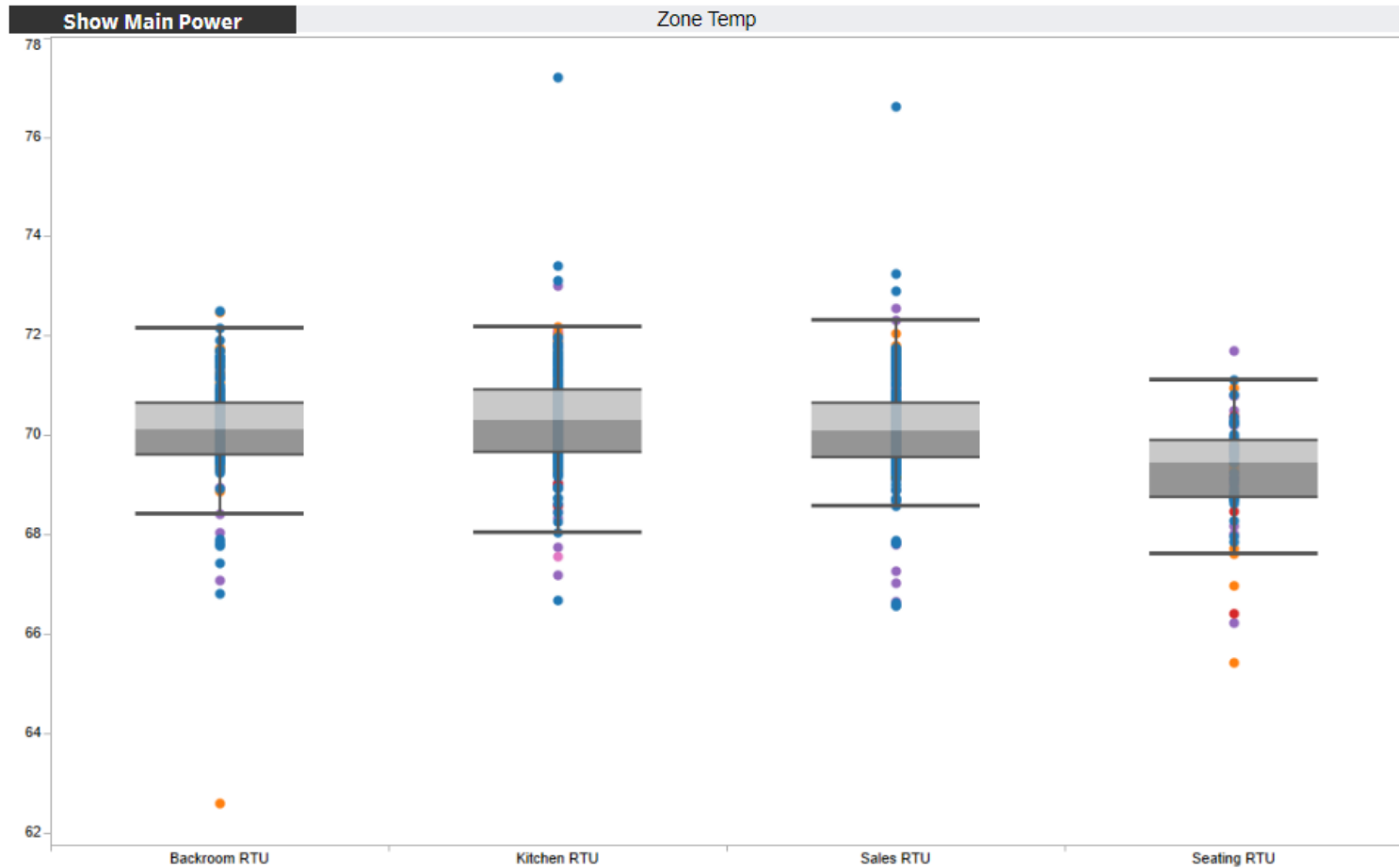
HVAC Audits

Utilizing Sensor Data to Identify Underperformers

- Identify Underperforming RTUs
 - Work with Techs to correct problems.
- BMS Improvements
 - Logic Updates- Understand how a how a unit should be performing performing
 - Future Pilots- Identify common trends and become proactive in site site performance.



Daily kWh Avg			
Store Numbers	Call Date Ran..	SD Call	
00486	3/10/2024-3/1..	12216735	Sales RTU-1 / Lennox RTU Alarm Lennox RTU Alarm is Active: Current Alarm Code is 56.0 at 2024-03-10 07:22:58
	3/18/2024-3/1..	12238252	Sales RTU-1 / Lennox RTU Alarm Lennox RTU Alarm is Active: Current Alarm Code is 56.0 at 2024-03-18 05:33:29
	3/30/2024-3/3..	12270786	Kitchen RTU-2 / High Zone Temp Alarm High Zone Temperature at 2024-03-30 17:39:30
		12270980	Kitchen RTU-2 / ZTMP_HI This zone is consistently too hot, even though the Cooling System is ok. at 2024-03-30 21:06:07
	4/4/2024-4/7/..	12282167	Sales RTU-1 / Lennox RTU Alarm Lennox RTU Alarm is Active: Current Alarm Code is 56.0 at 2024-04-04 05:21:05
	5/29/2024-5/3..	12436043	AC/HEATING - HVAC SRVC RQST - The heat is kicking on randomly later in the day and into the night.



Lessons to Share

Utilizing Sensor Data to Identify Underperformers

- **Understand your Units and Sites**
 - Having a deep understanding of what expected performance is goes a long way a long way in early detection.
- **Look at the entire Site**
 - We have 3-4 RTUs per site, issues can pop up that are the result of 2 units units covering for your underperformers.
- **Identify Stage 1 Failures**
 - Make sure each stage is pulling its weight.
- **Audit your data**
 - The data you use is only as good as the data is clean. Make sure you have good have good clean data to utilize.

Q & A

Submit Questions
www.slido.com event code #DOE



2024 Better Buildings SUMMER WEBINARS



REGISTER TODAY: betterbuildingsolutioncenter.energy.gov/bbws





THE BETTER BUILDINGS COMMERCIAL HEAT PUMP ACCELERATOR:

GOALS, IMPACTS, AND OPPORTUNITIES

Tue, August 6, 2024 | 11:00 AM - 12:00 PM ET

[REGISTER TODAY >](#)

DOE launched the Better Buildings Commercial Building Heat Pump Accelerator in April 2024. The Accelerator works with stakeholders to accelerate the development and adoption of heat pump packaged rooftop units (RTUs) to achieve integrated energy efficiency and electrification of buildings. Join this webinar to learn more about the Accelerator.

Other DOE-Sponsored Campaigns

The screenshot shows the homepage of the Better Buildings Commercial Building Heat Pump Accelerator. At the top, the Better Buildings logo is on the left, and a search bar with the text "Search 3,000+ solutions" is on the right. Below the logo is a blue banner with the text "Commercial Building Heat Pump Accelerator". Underneath the banner are two buttons labeled "CAMPAIGN" and "CHALLENGE". The main content area features the heading "COMMERCIAL BUILDING HEAT PUMP CAMPAIGN" and a paragraph explaining that heat pump rooftop units (RTUs) can reduce GHG emissions and energy costs by up to 50% compared to conventional RTUs. An image of RTUs on a rooftop is shown to the right. Below the text is another paragraph stating that the Commercial Building Heat Pump Campaign aims to help commercial building owners and operators reduce greenhouse gas emissions and operating costs by increasing the adoption of both existing and emerging heat pump technologies. The DOE will provide resources and guidance to deploy heat pump technology to support both site-level and portfolio-level installations.

Heat Pump Campaign

The screenshot shows the homepage of the Integrated Lighting Campaign website. At the top, the Integrated Lighting Campaign logo is on the left, and a search bar is on the right. Below the logo is a blue banner with the text "2023 ILC Recognitions Announced". Underneath the banner is a photograph of a group of people holding certificates. Below the photo is a section titled "Partners" with a paragraph explaining that the ILC recognizes commercial buildings that have achieved significant energy savings through the adoption of energy-efficient lighting technologies. Below this is a section titled "News and Events" with three cards for "Webinar" events. Below the webinars is a section titled "Resources" with three cards for "Webinars" and "Reports".

Integrated Lighting Campaign

The screenshot shows the homepage of the Efficient and Healthy Schools Program website. At the top, the Efficient and Healthy Schools logo is on the left, and a search bar is on the right. Below the logo is a blue banner with the text "Welcome to The Efficient and Healthy Schools Program". Underneath the banner is a photograph of a young girl smiling. Below the photo is a paragraph explaining that the Efficient and Healthy Schools Program (EHSP) aims to engage K-12 schools to improve energy performance and indoor air quality, with a focus on practical solutions involving HVAC and other technologies to reduce energy use and advance resilience. Below this is a section titled "Join Today" with a paragraph explaining that the program is free and that it offers a growing network of schools, school districts, and supporting organizations. Below this is a paragraph explaining that the program offers regular working groups, peer-to-peer discussions, and technical support on practical solutions that improve energy performance, reduce carbon emissions and promote a healthy learning environment in your school.

Efficient Healthy Schools Campaign

Additional Questions?

Please Contact Us



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Better Buildings Solution Center
<https://betterbuildingsolutioncenter.energy.gov/>



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