

Shannon Oliver
Manager of Energy & Sustainability
Adams 12 Five Star Schools

CASDEM Mtg. – DPS

September 5, 2019

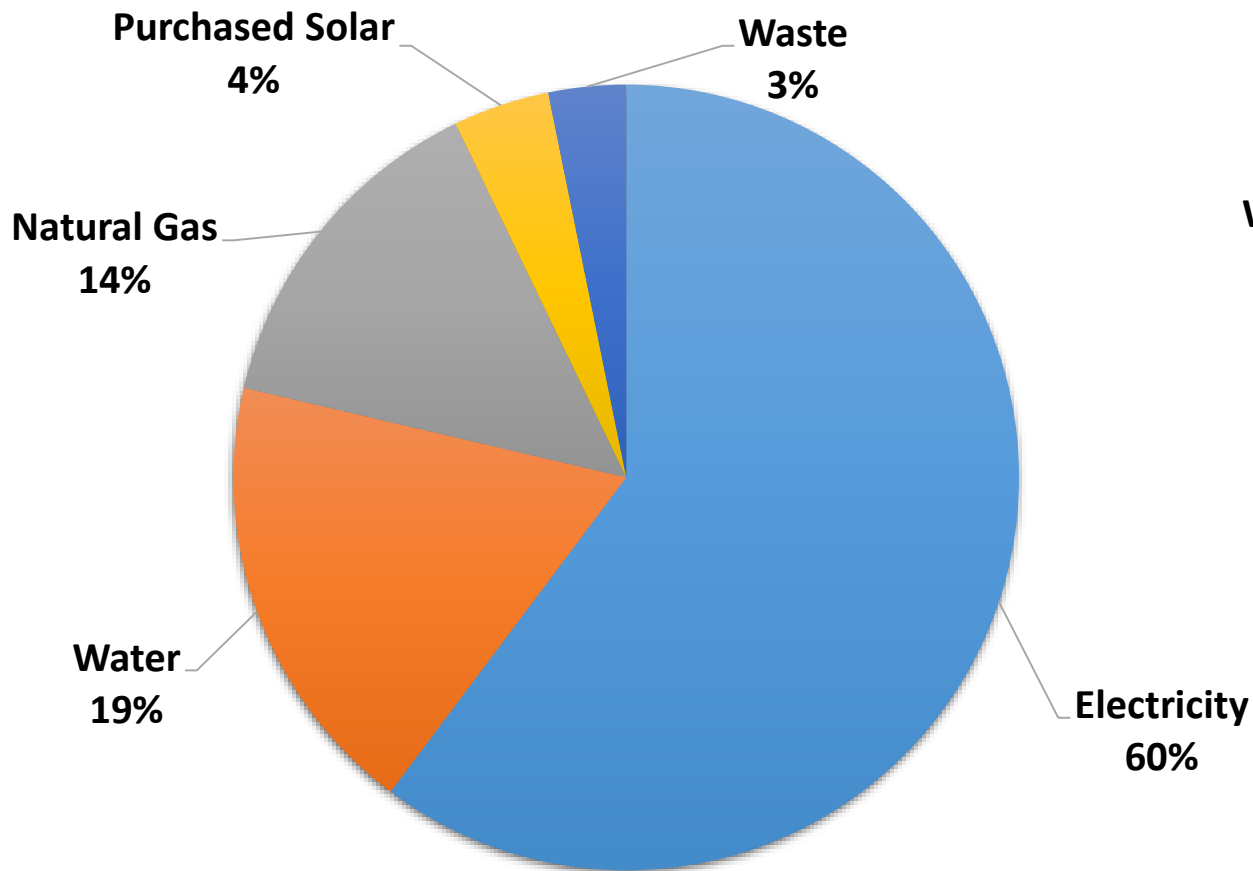
Primary Duties

- Develop and manage Sustainability Management Plan
- Manage Utility Budget
 - Electricity
 - Water
 - Natural Gas
 - Waste
 - Purchased Solar
- Manage Sustainability Personnel
 - Energy Engineer
 - Water Resource Specialist

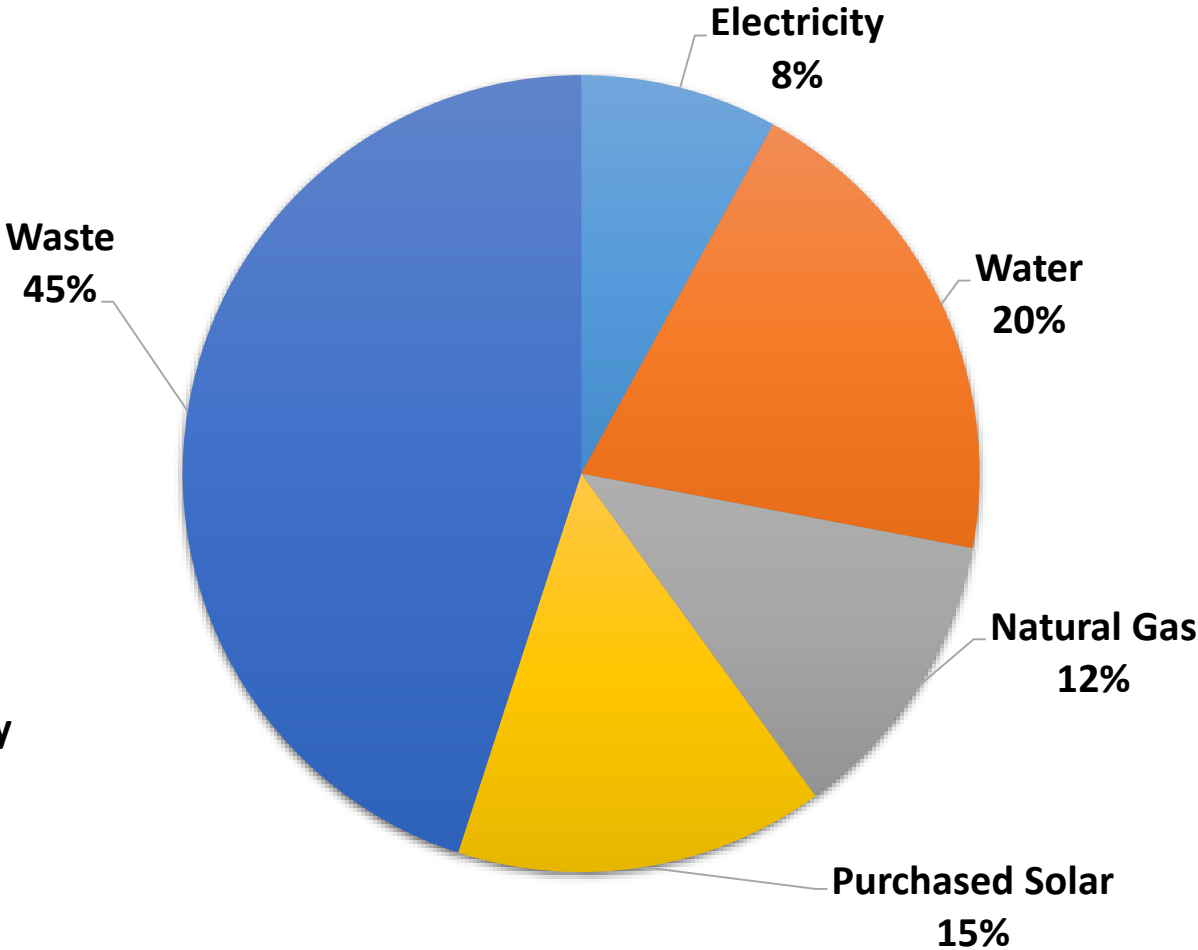
Other Stuff

- Construction Project Management
- Waste Audits
- Student Engagement
- IT trouble shooting
- Site Walks
- Work Order management
- Firefighter
- Counselor
- Landscape designer
- Compactor troubleshooter
- Invoice management
- Meetings...
- Procurement...
- Green building design
- Environmental sampling
- HVACSC controls
- Irrigation programming

Time, Value, Money...?



Annual \$\$ Spend



Time Spend

Waste (most days)



The Schools



Me

Waste (on a good day)

Waste Audits & Student Engagement



Waste – Success

- Diversion rate up to 19%
- 7 schools composting
- Battery, electronics, light bulbs and ink cartridges all now being captured in recycling



Water (most days)



“You’re wasting water!” – *Resident*



“You need to water more and what are all these weeds?! – *(same) Resident*

Water – Success!

- >10% (2017) and >23% (2018) usage savings
- Avoided costs over \$300,000 both years
- Actual savings...not shown due to rate increases 😞
 - Baseline avg rate: \$4.57/kGal
 - 2017 avg rate: \$5.71/kGal
 - 2018 avg rate: \$6.03/kGal

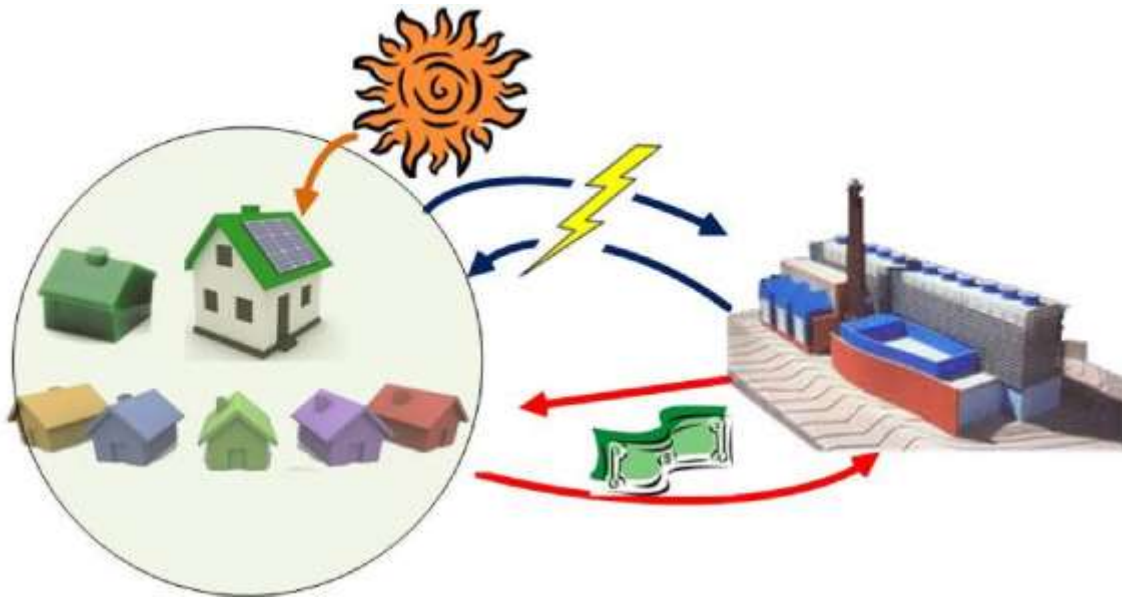
NATIVE LANDSCAPES

What to expect from native turf:

- It grows taller (12-18")
- It requires less maintenance
- It is mowed less frequently
- It may have sections of flowering plants
- It will not be vibrant green in hot months

Questions? Visit: www.adams12.org/sustainability

Purchased Solar



What We Purchased

Show that the solution to the SDE

$$X_t^x = B_t + \int_0^t \frac{x - X_s^x}{1 - s} ds, \quad t \in [0, 1), x \in \mathbb{R},$$

satisfies, for $s \leq t$,

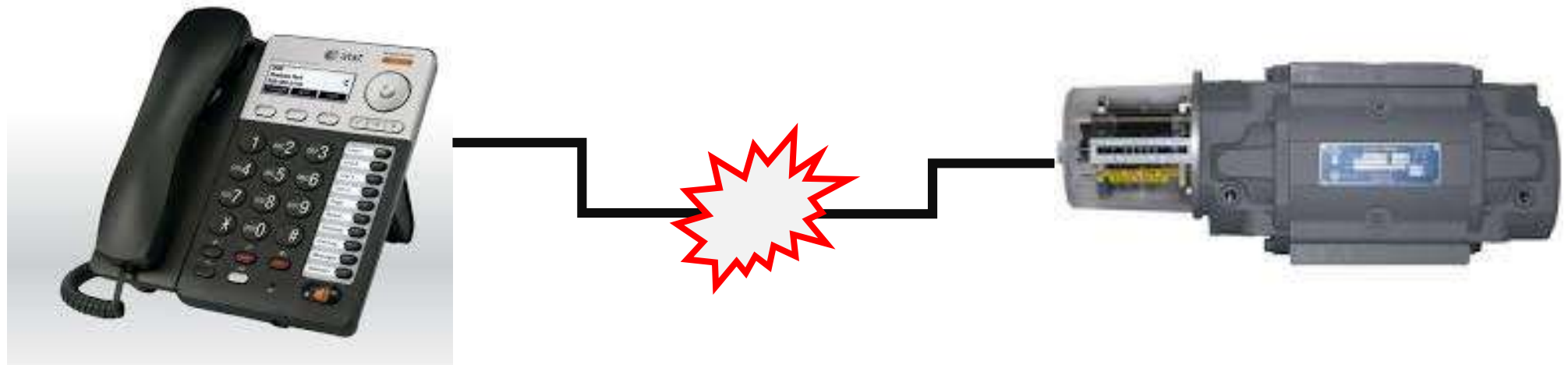
$$X_t^x = x \frac{t-s}{1-s} + X_s^x \frac{1-t}{1-s} + (1-t) \left(B_t - B_s + \int_s^t \frac{r}{1-r} dB_r \right).$$

Deduce from the above that the solution is given by

$$X_t^x = xt + (1-t) \left(B_t + \int_0^t \frac{s}{1-s} dB_s \right).$$

The Math I Do Each Month

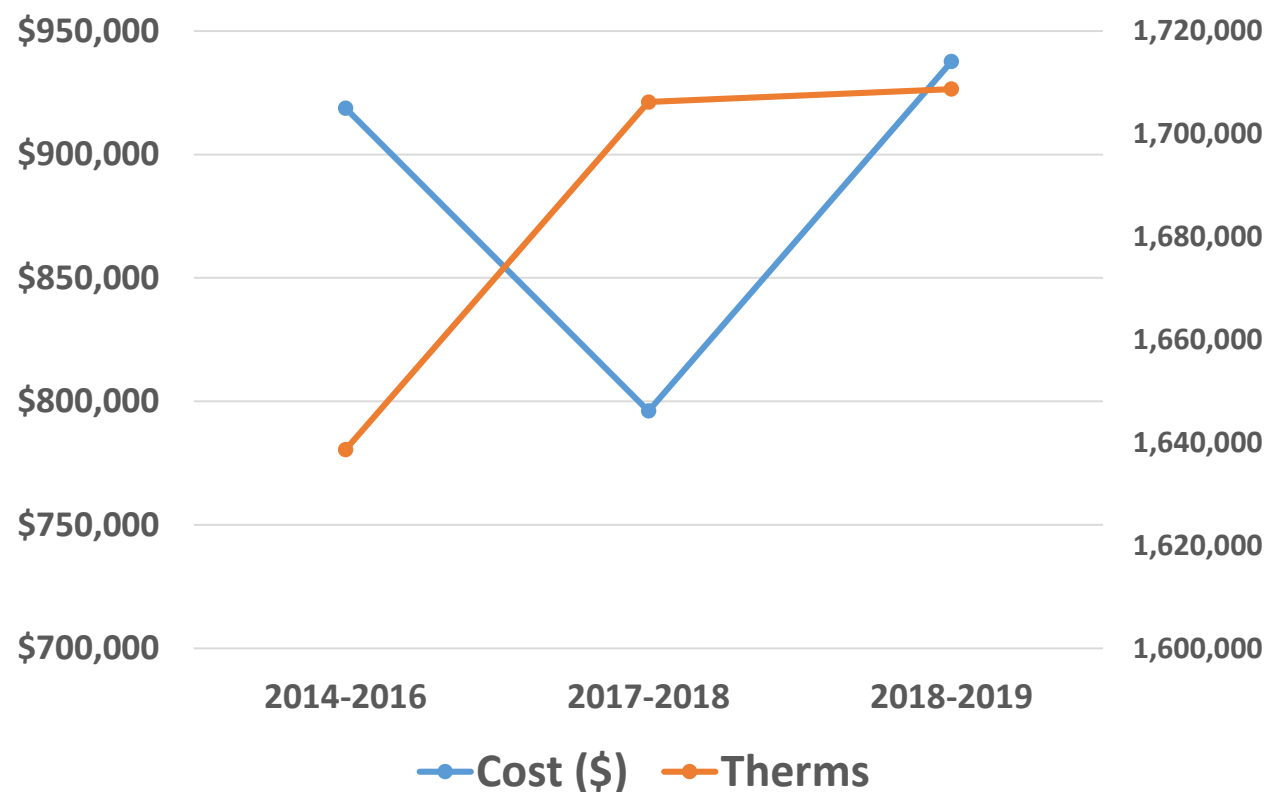
Natural Gas (most days)



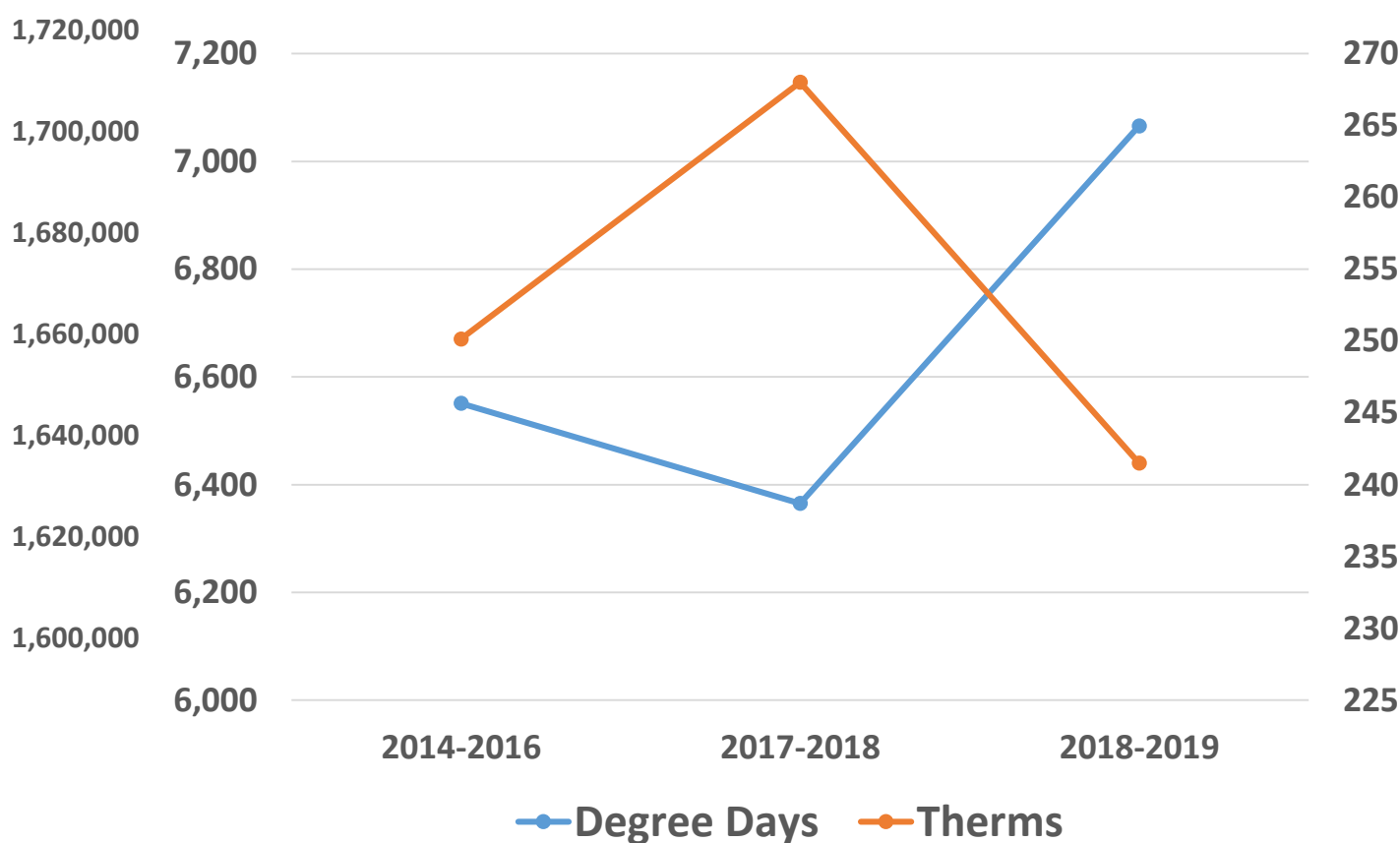
Countless connection issues with new digital switches

Natural Gas – mixed performance

Natural Gas History



Degree Days and Weather Normalized Therms



Electricity (most days)

Can we leave the lights on all night for security?

Do you have any money in your Utility budget for _____?

Can School X have a lower setpoint? One of the teachers is warm.

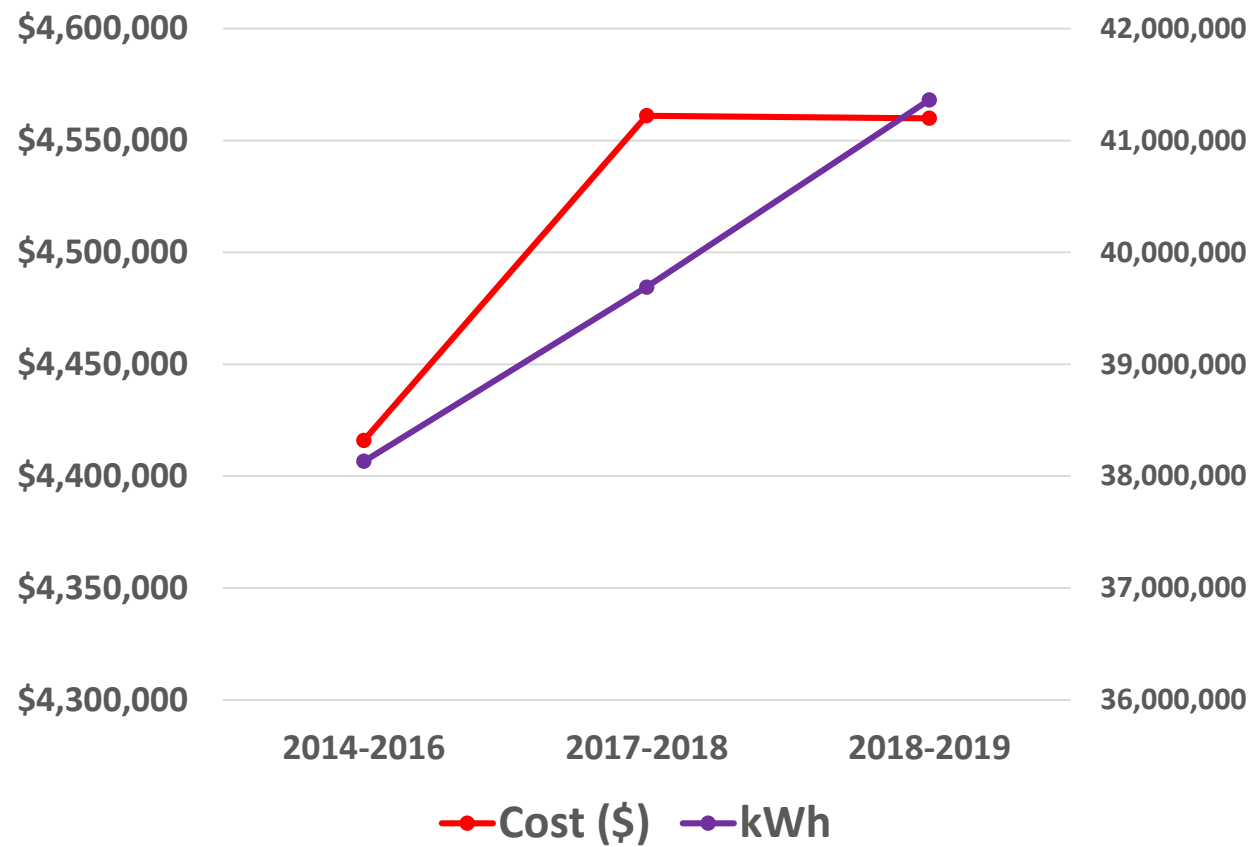
Finding this in a classroom...

The contractor wants to VE the VFDs for the VAV system.

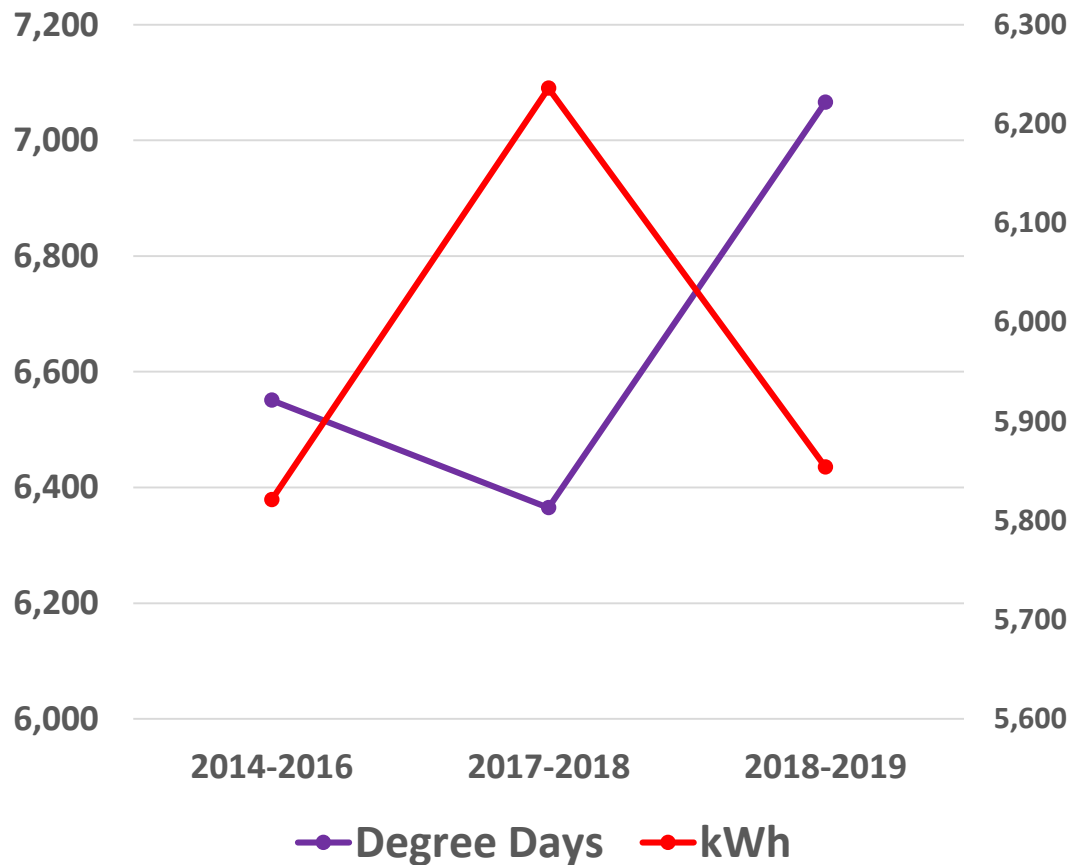


Electricity – mixed performance

kWh History



Degree Days and Weather Normalize kWh



Thanks for Listening!



**"GREAT IDEA BOSS! KEEPS KIDS OCCUPIED
AND HOOKED UP TO A GENERATOR
POWERS THE STORE'S LIGHTS!!"**

Pecha Kucha: How I've spent my time

Adam West

Project and Energy Efficiency Specialist

Sustainability, Denver Public Schools

	A	B	C	D	E	F	G
1	2018 assignments PM Assignments						
2							
3	PP	PM	Facility	Scope	Construction Budget-20.00	PM Managed Budget-All	Status
4			1855 Lincoln	Parking Garage Improvements			2017 project
5			1860 Lincoln	Elevator #1-6 Modernization			2018/2019 project
6			A. Lincoln	ADA Improvements, remodel, CC remodel & FF &E			2018 project
7			A. Lincoln	QLE-Remodel - update Tririga			2019 project
8			All City Stadium	Site Improvements GB 21144 and 60090			2017/2018 project
9			All City Stadium, T. Jefferson, Kunsmiller	Synthetic turf field			2018 project
10			All District	Cell Phone Towers			2017/2018 project
11			All District	Install Intruder Locks-All in 90.80			2017/2018 Project
12			All District	Repair Noted Deficiencies budget in			2018 project
13			Asbury, Cory, Knight, Merril, Slavens,	Full HVAC Assessment			2018 project
14			Asbury, Cory, Steele	HVAC Mechanical			2018 project
15			Barrett, Ebert, Ford, Garden Place, Hallett, Teller	Air Circulation comonents and automated controls			2018 project
16			Barrett, Pioneer Charter, Ebert, Hallett, Teller,	Full HVAC Assessments			2018 project
17			Beach Court, Remington, North	HVAC Mechanical			2018 project
18			Bryant Webster, Colfax, Cowell, Edison, Smedley	HVAC Mechanical			2018 project
19			Bryant Webster, Edison, Cowell, Fairview, Smedley	Full HVAC Assessment & Repair			2018 project
20			Byers	Warranty			2017/2018 Project
21			Cole	HVAC Mechanical			2017/2018 project
22			Cole	New Soccer Field			2017/2018 project
23			Cole	3rd floor office for DSST			2018 project
24			Cole	ceiling replacement			2018 project
25			Colfax	Kitchen Flooring-Need SSB			2017 project
26			Columbine, Gilpin,Ashley,Park	HVAC Mechanical			2018 project
27			Conservatory Green	Addition			2018 project

BOILER SCHEDULE

MARK	MANUFACTURER	MODEL	TYPE	FUEL	FUEL PRESSURE MIN/MAX (IN WC)	INPUT (MBH)	OUTPUT (MBH)	EFFICIENCY	FLUID	GPM	EWI (°F)	LWI (°F)	VOLT/PH/Hz	DIMENSIONS (WxDxH)	WEIGHT (LBS)	NOTES
B-1	RIELLO	AR 3000	CONDENSING	NG	3.5/20	3000	2160	90.0%	WATER	150	150	180	230/1/60	36x73x83	2504	1

NOTES:

1. PROVIDE BOILER WITH INTEGRAL PUMP, CONDENSATE NEUTRALIZATION KIT, AND ON-BOARD CONTROL PANEL.



PUMP SCHEDULE

MARK	MANUFACTURER	MODEL	SERVES	TYPE	GPM	HEAD (FT)	IMPELLER (")	EFF. (%)	FLUID	MOTOR (HP)	MOTOR (RPM)	VFD	VOLT/PH/Hz	NOTES
P-1,2	BELL AND GOSSETT	E-1510	HOT WATER LOOP	BASE MOUNTED	75	75	8.375	58	WATER	5	1750	YES	208/3/60	

NOTES:

BOILER	PRICE	WATER	CONDENSATE NEUTRALIZATION KIT	ON-BOARD CONTROL PANEL	WATER	PRICE	WATER	CONDENSATE NEUTRALIZATION KIT	ON-BOARD CONTROL PANEL	WATER	PRICE	WATER	CONDENSATE NEUTRALIZATION KIT	ON-BOARD CONTROL PANEL
BOILER	PRICE	WATER	CONDENSATE NEUTRALIZATION KIT	ON-BOARD CONTROL PANEL	WATER	PRICE	WATER	CONDENSATE NEUTRALIZATION KIT	ON-BOARD CONTROL PANEL	WATER	PRICE	WATER	CONDENSATE NEUTRALIZATION KIT	ON-BOARD CONTROL PANEL

GAS-FIRED WATER HEATER SCHEDULE

PLAN CODE	MANUFACTURER & MODEL OR EQUAL	SERVES	TYPE	GPH RECOVERY @ 100°F RISE	HEATING CAPACITY (BTUH)	RATED EFFICIENCY	CAPACITY (GAL)	FLUE SIZE	CONTROL VOLTAGE	DIMENSIONS (IN)		WEIGHT (LBS)	NOTES
										HEIGHT	DIAMETER		
GWH-1	PVI CONQUEST L 130A-GCML	DOMESTIC HOT WATER	CONDENSING TANK	471	399	97%	130	4"	NOTE 3	82	52	1,800	1,2,3,4
GWH-2	PVI CONQUEST L 130A-GCML	DOMESTIC HOT WATER	CONDENSING TANK	471	399	97%	130	4"	NOTE 3	82	52	1,800	1,2,3,4

NOTES:

1. REFER TO HVAC DRAWINGS FOR FLUE AND COMBUSTION AIR ROUTING.
2. LOCATE ON 6" HOUSE KEEPING PAD.
3. 120/1/60, 20 AMP, 11AMP FLA.
4. ASME RATED.

PLUMBING FIXTURE & EQUIPMENT CONNECTION SCHEDULE

FIXTURE	COMPONENT	MANUFACTURER	MODEL	COLOR	DESCRIPTION	FLOW RATE (GPM/GPF)	ACCESSIBLE	WASTE	VENT	CW	HW
WC-1	WATER CLOSET SEAT FLUSH VALVE	TOTO TOTO TOTO	CT708E SC534 TMT1LN32#CP	WHITE WHITE CHROME	WALL HUNG, SIPHON JET, TOP SPUD, ELONGATED RIM, RE: ARCH FOR MOUNTING HEIGHT. OPEN FRONT SOLID PLASTIC SEAT. MANUAL TYPE FLUSH VALVE.	1.28	NO	4"	2"	1"	-
WC-2	WATER CLOSET SEAT FLUSH VALVE	TOTO TOTO TOTO	CT708E SC534 TMT1LN32#CP	WHITE WHITE CHROME	WALL HUNG, SIPHON JET, TOP SPUD, ELONGATED RIM, RE: ARCH FOR MOUNTING HEIGHT. OPEN FRONT SOLID PLASTIC SEAT. MANUAL TYPE FLUSH VALVE.	1.28	YES	4"	2"	1"	-

GROUP

7111 17th Street, Suite 1000
DENVER, CO 80202
T: 303.733.1111
F: 303.733.1111
WWW.GROUP.COM

OWNER'S REPRESENTATIVE Name: _____ Title: _____ Company: _____	DATE: _____ TIME: _____ BY: _____	MECHANICAL SCHEDULES M-601
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Sustainability Notes

On JEEP?

Rebate
Amount
(non EMS)

Submitted?

Application
Approved?Check
Issued?

LEDS:

2gtl, 2gtl4 submitted OA0075467 OID3864918 ~\$4470

still more 2gtl4, WST submitted 8/5 OA0078912 \$405

LDN6 submitted 8/5 OA0078931 \$775, sent ESTAR listing to Mel on 8/7

2gtl4 2gtl2 gtl4 submitted 8/14 OA0080341 OID3898141 \$900

Boiler: submitted OA0067604 OID3798773 ~\$10,500 chec

Water heater: submitted OA0067562 OID3798789 ~\$1000

2x5HP HWP VFDs: submitted OA0067551 OID3796197 ~\$

MAU: 13.8 EER, VFD?; RTU 1 & 2: VFDs were factory inst
split system;

WC flush valve not WS;

^LITHONIA CO#5

This Lot Shipment Consists of:

Ord Qty Shp Qty Description

25 25 2GTL4 4400LM EL14L PWS1846

PWSLV LP840

Type: R1E

SubType:

3 3 2GTL2 3700LM EL14L PWS1846

PWSLV LP840

Type: R3E

SubType:

2 2 GTL4 3700LM EL14L PWS1846

PWSLV LP840

Type: R4E

SubType:

12 12 WGZ48

Type: S1E

SubType:

Contractor?

Invoice?



FEATURE

INTENDED USE
luminaire, wh
one-for-one t
savings, this v

Rebate Application



Sustainability Notes	On JEEP?	Rebate Amount (non EMS)	Submitted?	Application Approved?	Check Issued?
LEDs: 2gtl, 2gtl4 submitted OA0075467 OID3864918 ~\$4470 still more 2gtl4, WST submitted 8/5 OA0078912 \$405 LDN6 submitted 8/5 OA0078931 \$775, sent ESTAR listing to Mel on 8/7 2gtl4 2gtl2 gtl4 submitted 8/14 OA0080341 OID3898141 \$900 Boiler: submitted OA0067604 OID3798773 ~\$10,500 check issued Water heater: submitted OA0067562 OID3798789 ~\$1000; check issued 2x5HP HWP VFDs: submitted OA0067551 OID3796197 ~\$1800 check issued MAU: 13.8 EER, VFD?; RTU 1 & 2: VFDs were factory installed, no rebate; small split system; WC flush valve not WS;			Boiler, Water Heater, VFDs, LEDs: 2GTLs, 2gtl4+WST, LDN6, 2gtl4	Boiler, Water heater, VFDs, LEDs: 2GTLs, 2gtl4+WST, LDN6, 2gtl4	Boiler, water heater, VFDs, LEDs: LDN6,

All values are
Specifications

ORDERING

Catalog

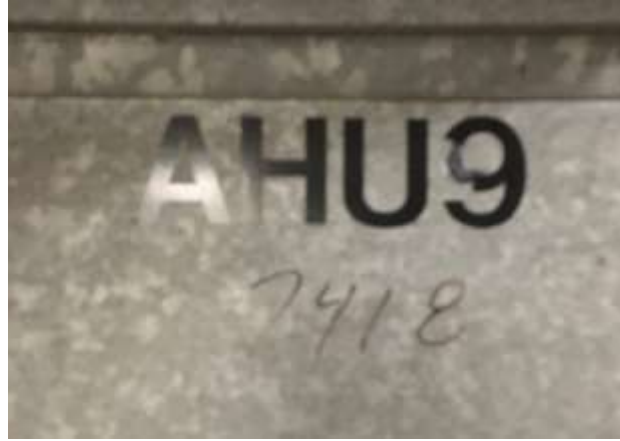
Please complete this application without logging out. If you exit, you will have to submit a new rebate request. For any questions, contact our Customer Service Center at 1-800-895-4999.

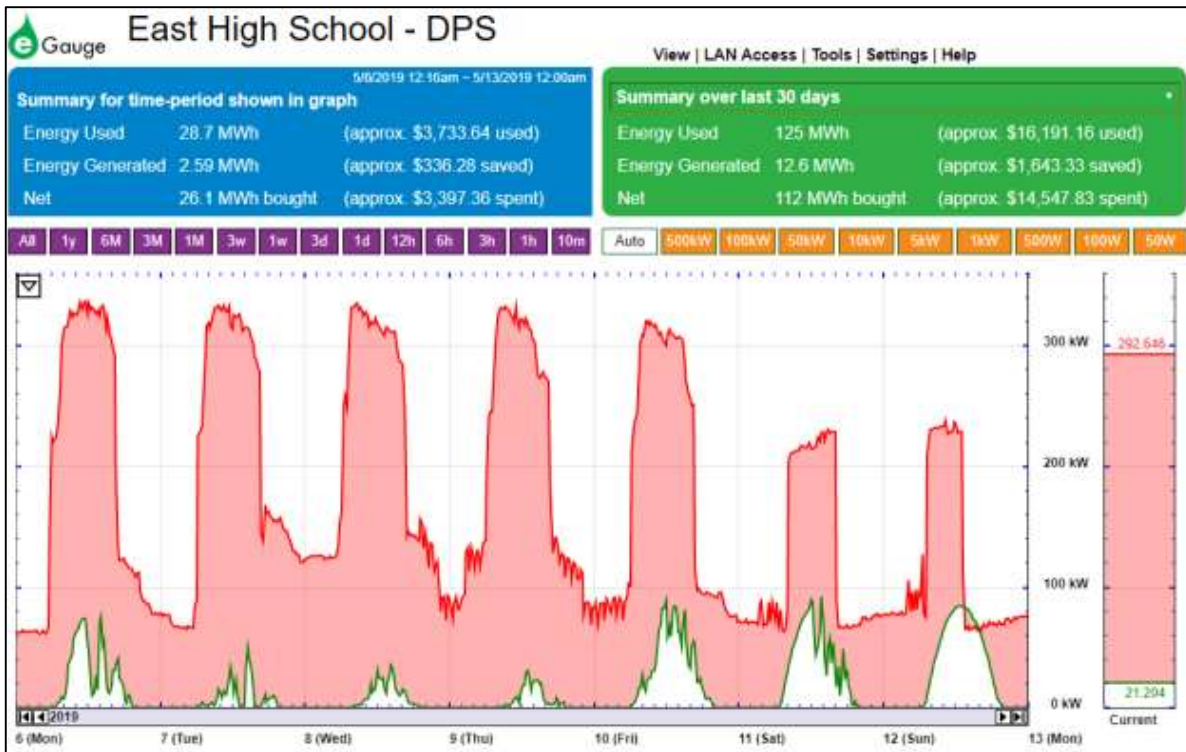
2GTL2 3300LM LP835	889804702637	2x2 LED lay-in troffer	3261	3500K	Patterned #12 acrylic	120-277	32.3	56	1
2GTL2 3300LM LP840	889804702460	2x2 LED lay-in troffer	3349	4000K	Patterned #12 acrylic	120-277	32.3	56	1
2GTL2 3300LM 347 LP835	889804703634	2x2 LED lay-in troffer, 347v	3261	3500K	Patterned #12 acrylic	347	32.3	56	1



- # Other Paths:
- Shop Installs
 - Word of mouth
 - Site visits
 - Field verification

Xcel Energy rebate - lighting at Swansea from receipts (642.00_7-30-18_conserve a watt; 140.00_8-22-18_fsgi)
Xcel Energy rebate for solar EGD Campus
MSP Master Agreement for solar sites - use fee
Xcel Energy rebate - boilers at Manuel from project, field verified
Xcel Energy rebate - 25HP Yaskawa VFD for fan at Centennial Elem
Xcel Energy rebate - 3x3HP VFDs for HWP's at Kaiser from project, field verified
Xcel Energy rebate - lighting (LDN6) at Del Pueblo from project invoice
Xcel Energy rebate - lighting at Mitchell from receipts (1354.26_8-22-18_d3 lighting; 119.84_8-13-18_d3 lighting; 1094.30_11-20-18)
Xcel Energy rebate - lighting (LDN6) at Washington from project invoice

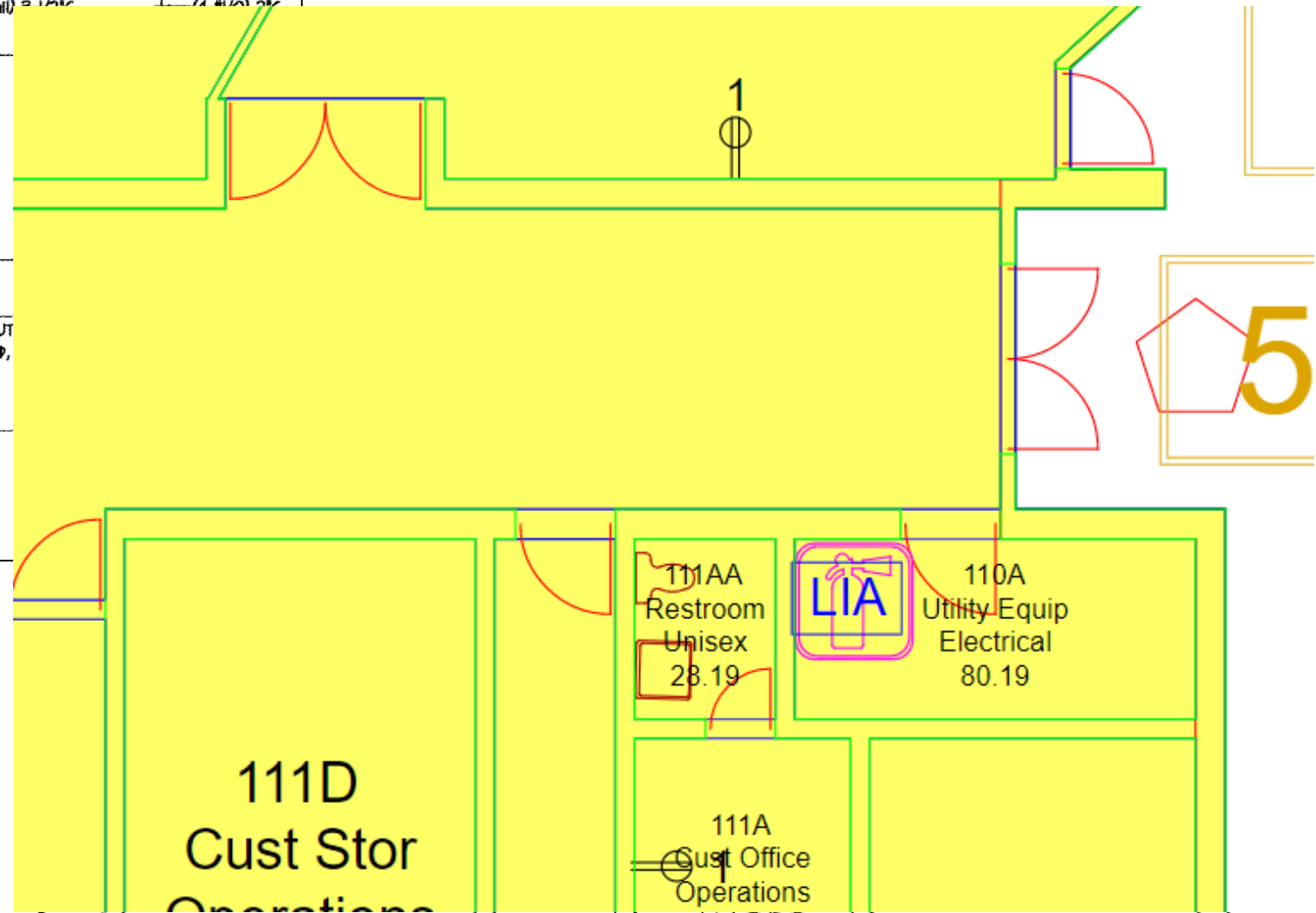
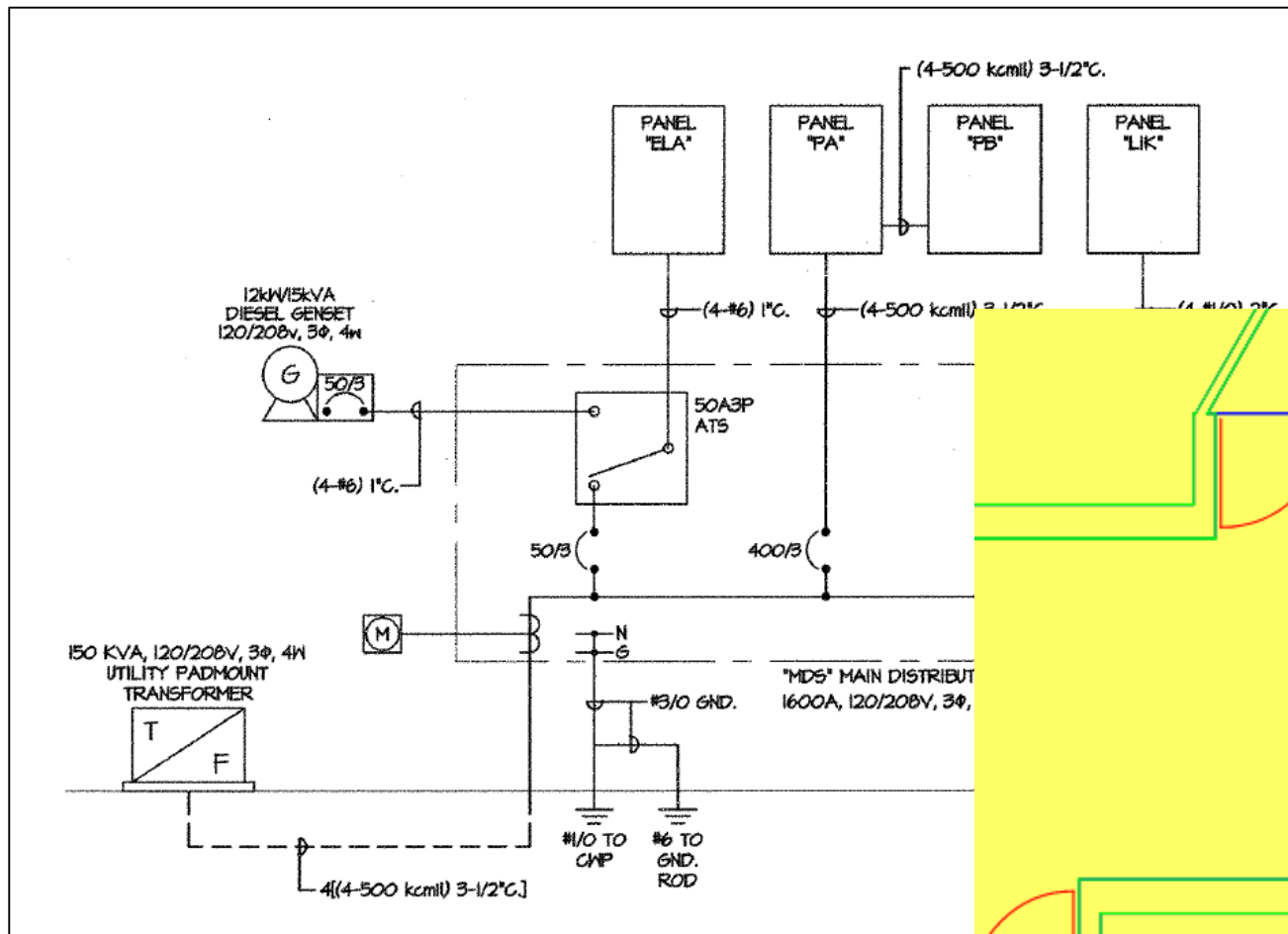




Program Name	Title I Status 2018-19		Low Grac	High Grac
P.R.E.P. Academy HS	Title I School-Wide Program	SW	9	12
P.R.E.P. Academy MS	Title I School-Wide Program	SW	6	8

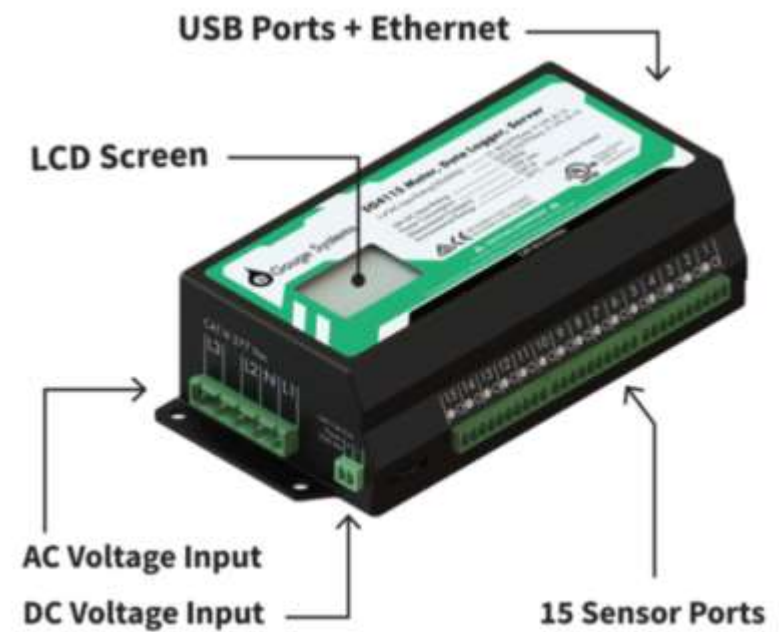
Ownership	Building Name	2018 EUI (kbtu/sq.ft./yr)	Equity ind	Planning Region
DPS Owned Facility	Prep Center	58.14	2.08	CEN
DPS Owned Facility	Prep Center	58.14	2.08	CEN

Sustainability Club or Other Support?

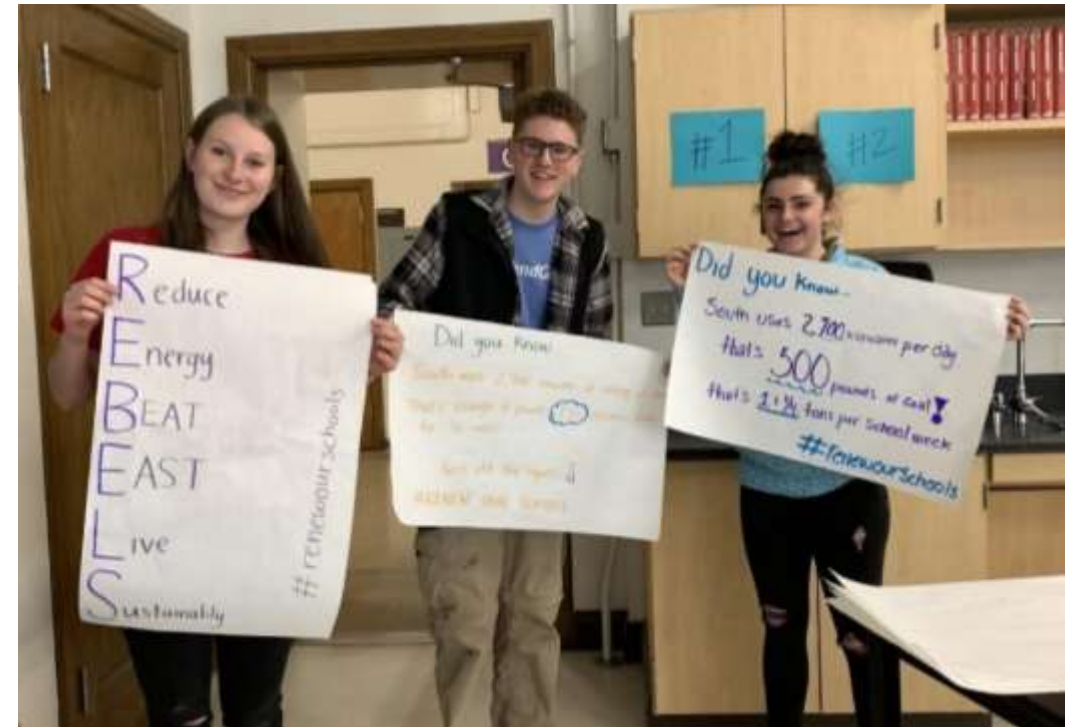
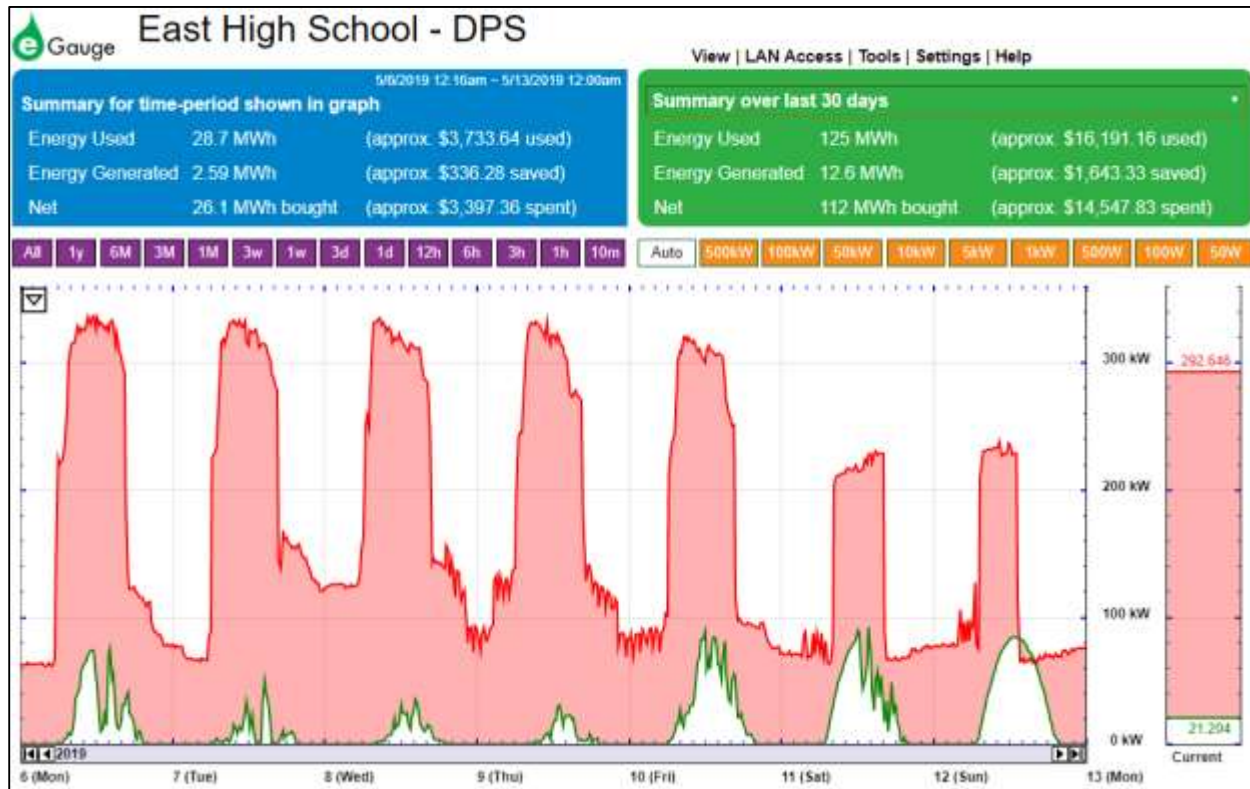




Hostname [?]	eGauge4
Automatically obtain address with DHCP [?]	<input type="checkbox"/>
IP address [?]	10
Netmask [?]	255
Network [?]	10
Broadcast address [?]	10
Gateway address [?]	10
Name server 1 [?]	10.0.200.
Name server 2 [?]	10.0.200.



- Understand Elec Use/Production
- Identify problems/opportunities
- Student Engagement



East High School

Total Power

MONTHS

DAYS

INTERVAL

Auto Axis

12:00AM

Saturday

August

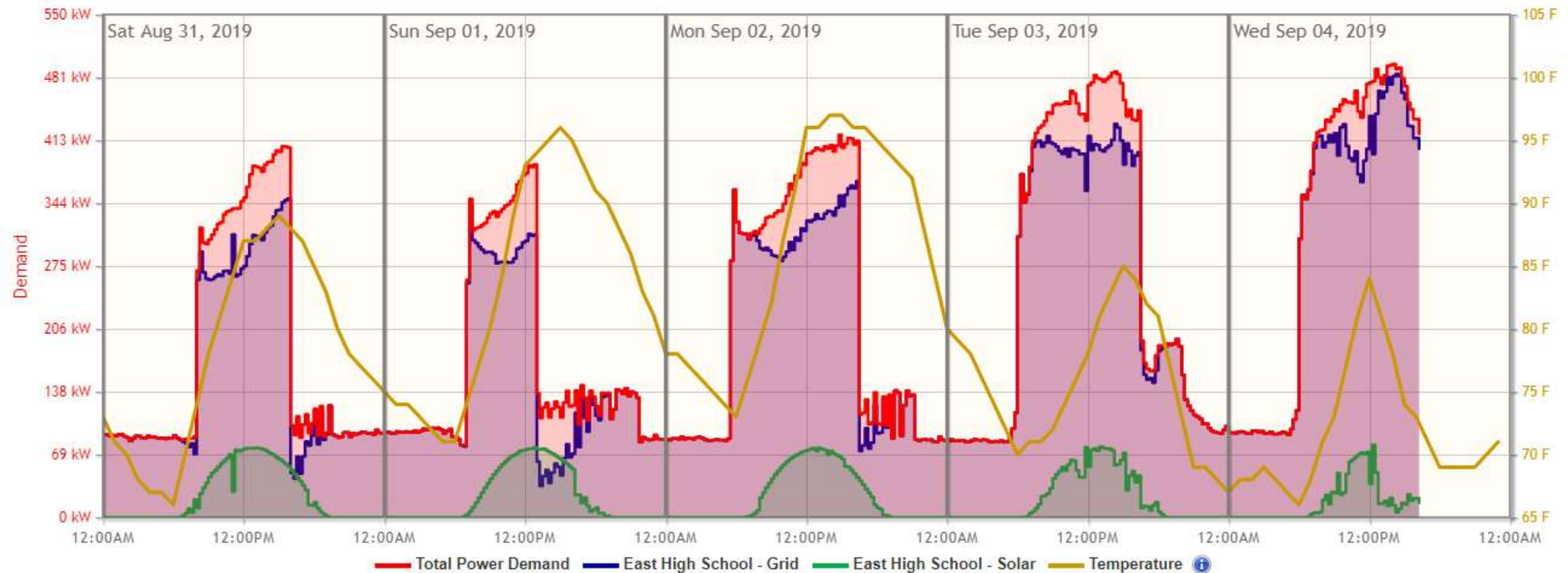
31

2019

for

5 Days

Today



Peak Demand

496 kW

2:00 PM

Total Consumption

24,919 kWh

Avg Temperature

79.1 F



Interval view:

15 minutes

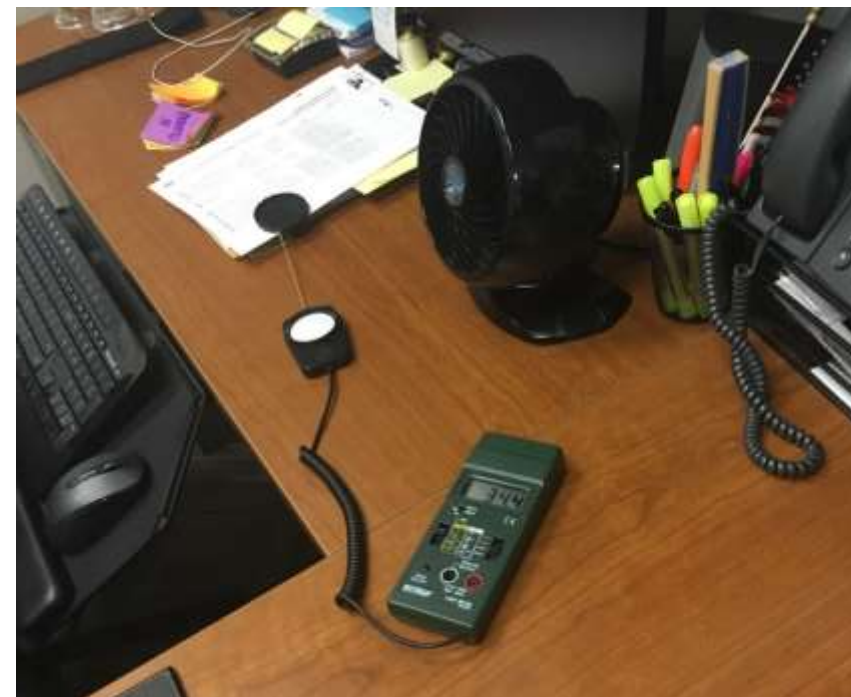
Compare with:

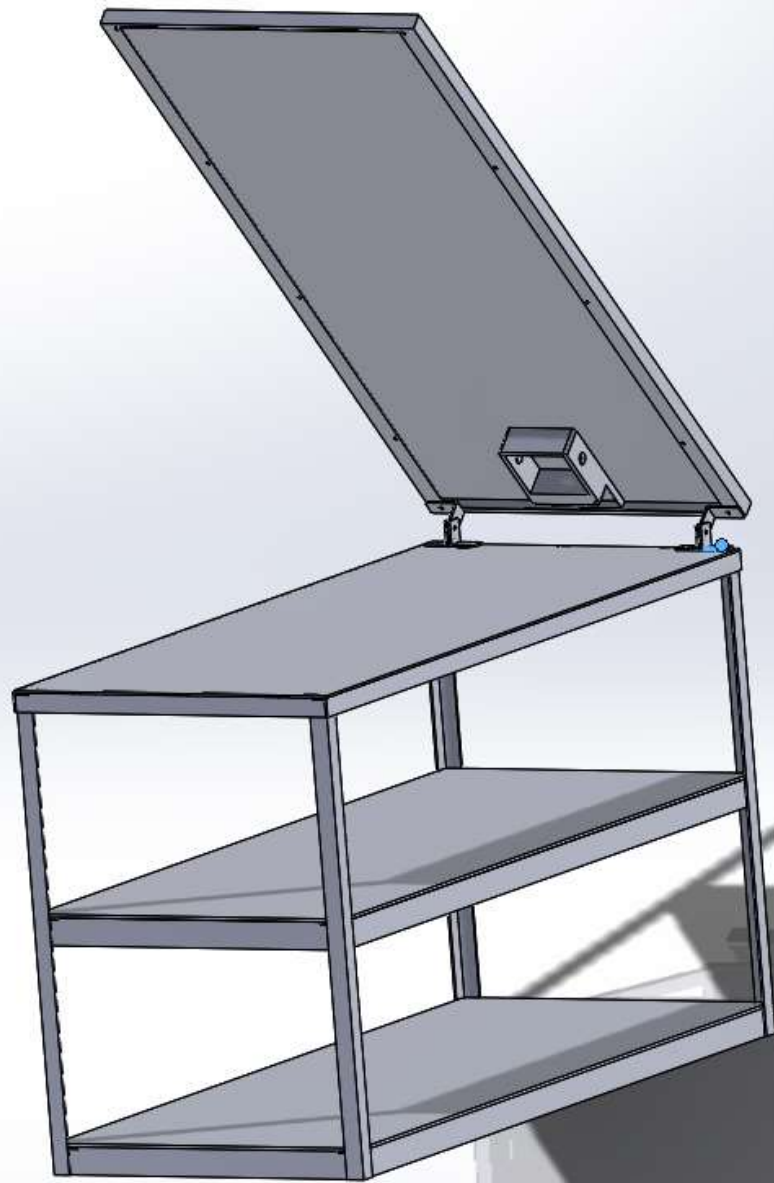
Other Data Feed(s)

[Select Data Feed\(s\)](#)

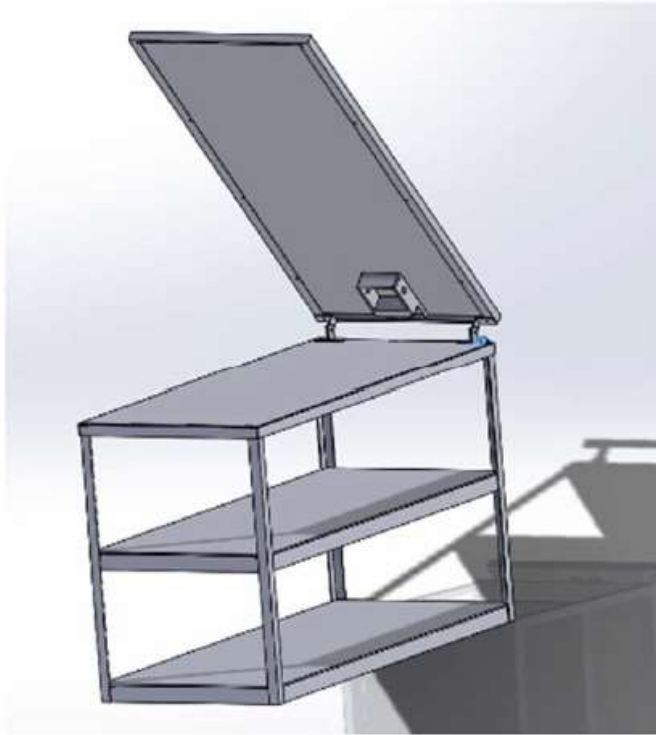
Demand line:

None





Custom Aluminum Utility Cart



(Custom Utility Cart in SolidWorks by Diego Garcia)

Total Cost: \$950

- Angle: \$148
- Sheet: \$262
- Casters: \$40
- Labor: \$500

Pros:

- Custom fit to solar panel
- Light weight
- Custom shelf height to accommodate electrical

Cons:

- More expensive

Store Bought Steel Utility Cart



(Steel Flat Handle Utility Cart Mfr. Model # RSC-2448-3-BLU-95)

Total Cost: \$647.59

- Cart \$495.77
- Estimated Standard Shipping \$151.82

Pros:

- Cheaper
- Easy grip handle

Cons:

- Weight (~150 lbs)
- Not aluminum
- Shelf Clearance is a concern



SECTION 06 10 00

ROUGH CARPENTRY



PART 1 GENERAL

1.01 GENERAL DESIGN GUIDELINES

- A. In general work in this section is not specified in other sections and is not exposed to normal view.
- B. Wood frame construction is not preferred in DPS facilities. Use of wood frame construction requires A/E coordination with building code requirements and approval of DPS.
- C. Provide continuous fire-retardant treated ¾" plywood or OSB continuous lumber blocking at all mounting locations including but not limited to:
 - 1. Handrails and guardrails
 - 2. Door stops
 - 3. Hold opens
 - 4. Grab bars
 - 5. Architectural specialties
 - 6. Plumbing fixtures
 - 7. Toilet accessories
 - 8. Luminaires (wall mounted)
 - 9. Surface mounted devices
 - 10. Casework and shelving (wall mounted)
 - 11. Industrial shelving

ADAM_WEST 7:31 AM

Reply x

Would like to add:

PART 2 PRODUCTS

2.01 MATERIALS

A. Composite Wood Products: Products shall be made using ultra-low-emitting formaldehyde resins as defined in the California Air Resources Board's "Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products" or shall be made with no added formaldehyde.

B. Multipurpose Construction Adhesive: Adhesives shall have a VOC content of 70 g/L or less.



100% Construction Documents
18 February, 2019

Denver Public Schools -
Holm Elementary
AMD #17-055 / DPS # 294-6301-RI

SECTION 01 35 46

INDOOR AIR QUALITY PROCEDURES

PART 1 - GENERAL









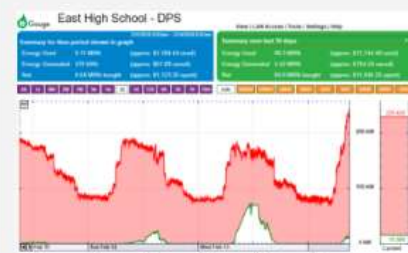
DENVER
PUBLIC
SCHOOLS

Sustainability

[Home](#)

[About Us](#)

Welcome to Sustainability at Denver Public Schools! Our team improves resource efficiency, engages students and staff, and promotes sustainability across the district. Our website is currently under construction, and we will be rolling out more content over time. For now, please check out the links below.



DPS schools are competing to save energy in Renew Our Schools 2.0!

The competition runs from February 19th to April 1st.



What are you doing for Earth Day 2020, its 50th anniversary?

Earth Day's 50th anniversary is Wednesday April 22nd, 2020! Let us know what you'd like to do or how we can help at dept_sustainability@dpsk12.net!



Garden of Youth

To learn more about our garden program, [click here!](#)



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CASDEM - ADAM_WEST@dpsk12.org - Outlook

File Home Send / Receive Folder View Tell me what you want to do...

New Email New Items New Meeting TeamViewer

Ignore Clean Up Delete Reply Reply All Forward Meeting IM More Xcel Rebates LED Retrofit To Manager Done Rules OneNote Move Unread/ Read Categorize Follow Up Search People Address Book Filter Email Report Phish PhishAlar...

Quick Steps Move Tags Find

Favorites

Inbox 167

Unread Mail 220

Sent Items

Deleted Items 121

Archive

Conversation History

Inbox 167

179D EE Comm. B...

Capital Planning

CASDEM

DoTS

All Unread Search CASDEM (Ctrl+E) Current Folder

FROM SUBJECT RECEIVED SIZE

Date: Yesterday

Leedy, Dar... CASDEM lunch Tue 9/3 9:18 AM 18 K

Sorry, I am going to be out as well. Regards, Darel Leedy Application Engineer | Sustainability

Date: Two Weeks Ago

Craig Wrig... Sept 5th CASDEM Meeting & Other News Mon 8/19 9:23 AM 408 K

Hi Jim. It's taken care of. Not sure how I missed that. Regards, Craig Wright Natural and

Date: Three Weeks Ago

Corin Hal; ... [EXTERNAL] Re: Sept CASDEM Location Wed 8/14 10:38 AM 62 K

Will do, Thanks Jim Hal Corin Energy Manager Jeffco Public Schools

Date: Older

Craig Wrig... Happy New Year Tue 7/16 10:59 AM 31 K

Reply Reply All Forward IM

Tue 9/3/2019 9:18 AM

Leedy, Darel

RE: CASDEM lunch

To: ☒ Faes, Jim; ☐ Gavin, Melanie J; ☐ Corin Hal

Cc: ☐ Punkay, Eric; ☒ West, Adam; ☐ Woodburn, Christopher

Sorry, I am going to be out as well.

Regards,

Darel Leedy

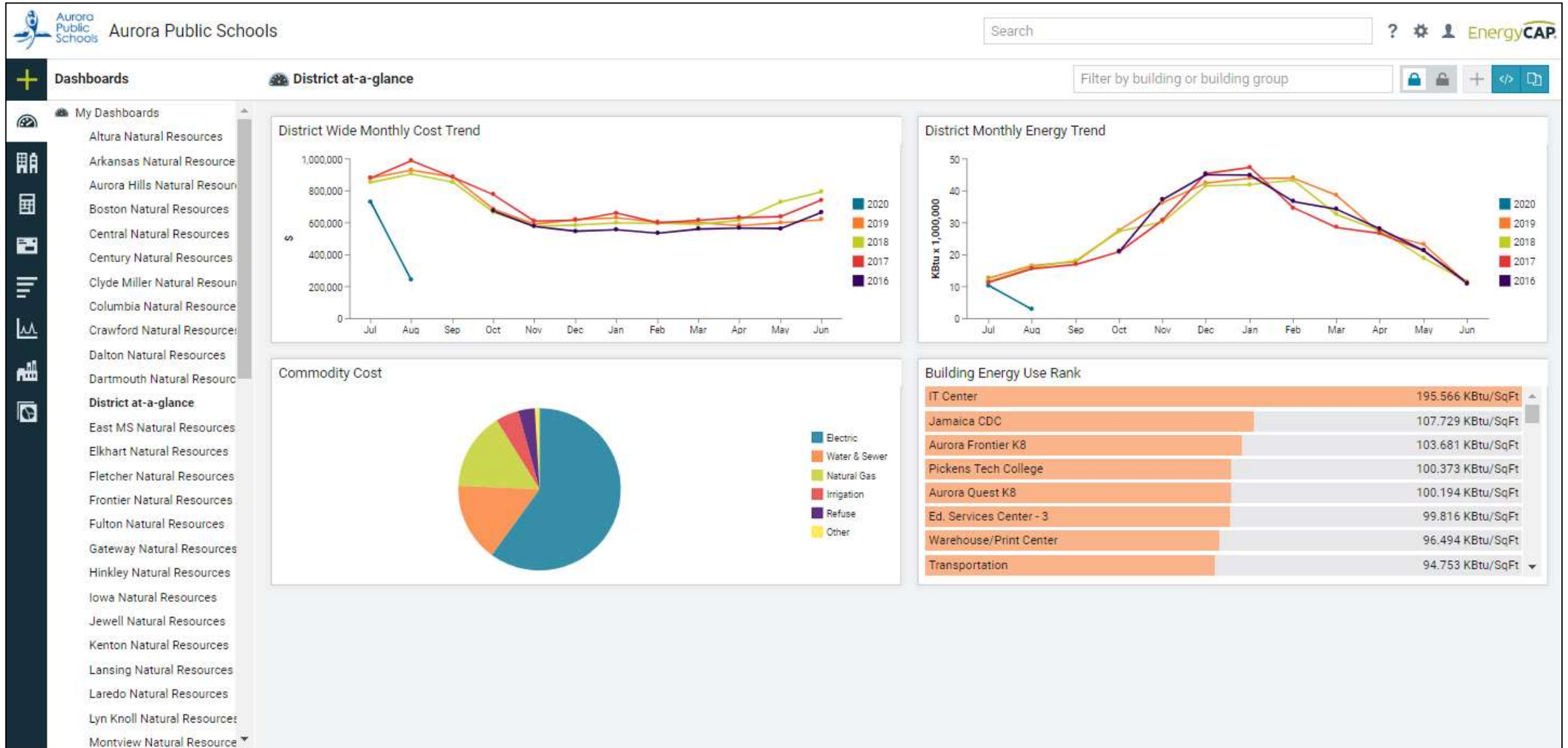




APS Energy Management Tools

Presented by:
Craig Wright – Natural and Renewable Resources Manager

EnergyCAP Portal



Main School Dashboard Page

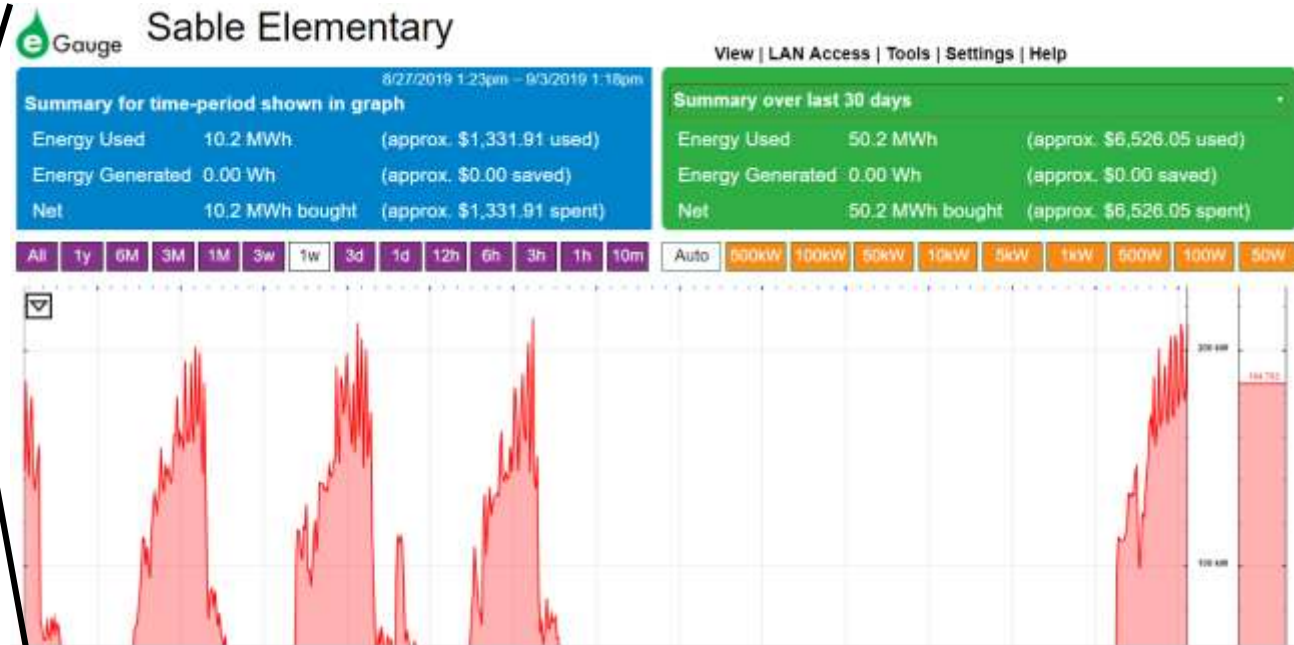
Elementary Schools (P-5)

ALTURA	ARKANSAS	CENTURY	CRAWFORD	DALTON
Altura Meter	Arkansas Meter	Century Meter	Crawford Meter	Dalton Meter
DARTMOUTH	ELKHART	FLETCHER	FULTON	IOWA
Dartmouth Meter	Elkhart Meter	Fletcher Meter	Fulton Meter	Iowa Meter
JEWELL	KENTON	LANSING	LAREDO	LYN KNOLL
Jewell Meter	Kenton Meter	Lansing Meter	Laredo Meter	Lyn Knoll Meter
MONTVIEW	PARIS	PARK LANE	PEORIA	SABLE
Montview Meter	Paris Meter	Park Lane Meter	Peoria Meter	Sable Meter
SIDE CREEK	SIXTH AVE	TOLLGATE	VASSAR	VAUGHN
Side Creek Meter	Sixth Ave Meter	Tollgate Meter	Vassar Meter	Vaughn Meter
VIRGINIA CT	WHEELING	YALE		
Virginia Ct Meter	Wheeling Meter	Yale Meter		

P-8, K-8 & Middle Schools

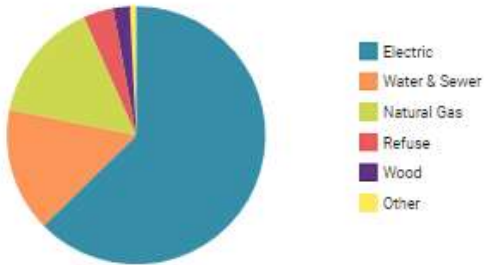
AURORA HILLS	BOSTON	CLYDE MILLER	COLUMBIA	EAST
Aurora Hills Meter	Boston Meter	Clyde Miller Meter	Columbia Meter	East Meter
FRONTIER	MOSLEY	MRACHEK	MURPHY CREEK	NORTH
Frontier Meter	Mosley Meter	Mrachek Meter	Murphy Creek Meter	North Meter

Webpage customized using WordPress

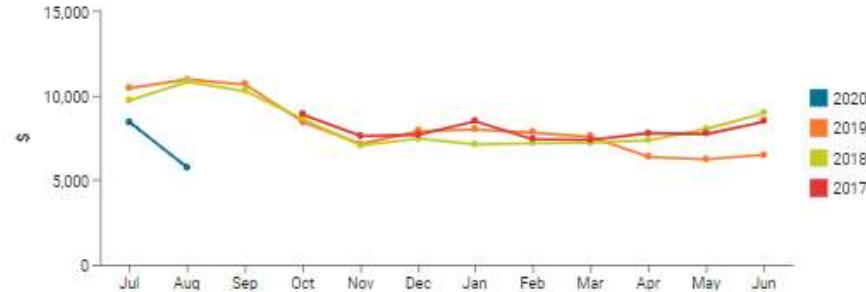


School Specific Dashboard

Sable Annual Expenses



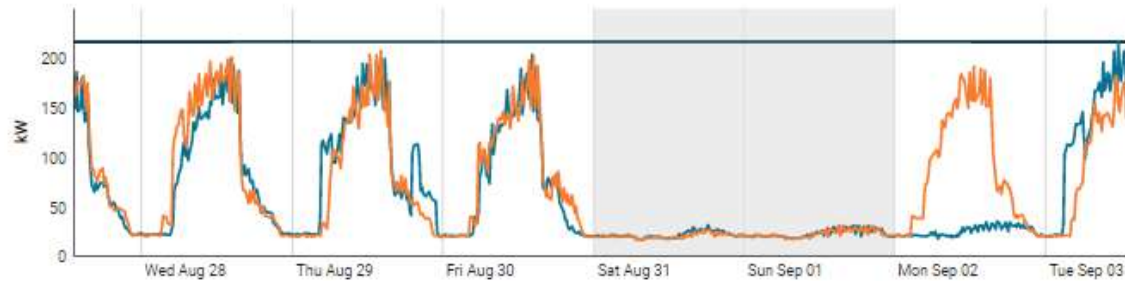
Sable Monthly Expenses



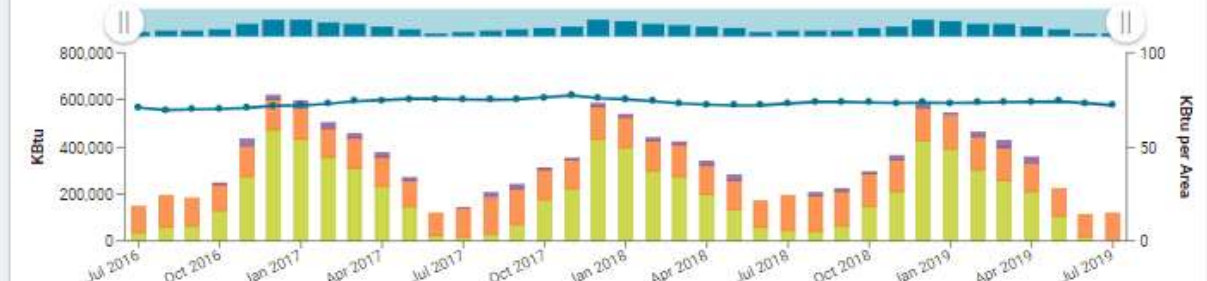
Sable Energy(Gas & Ele)By Mo



Sable Weekly Electrical Use



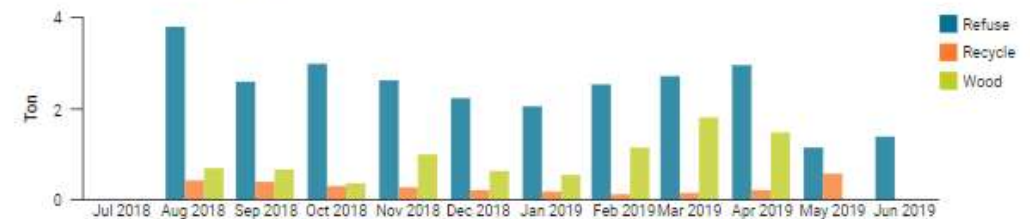
Sable Gas (Grn) Ele (Orn)



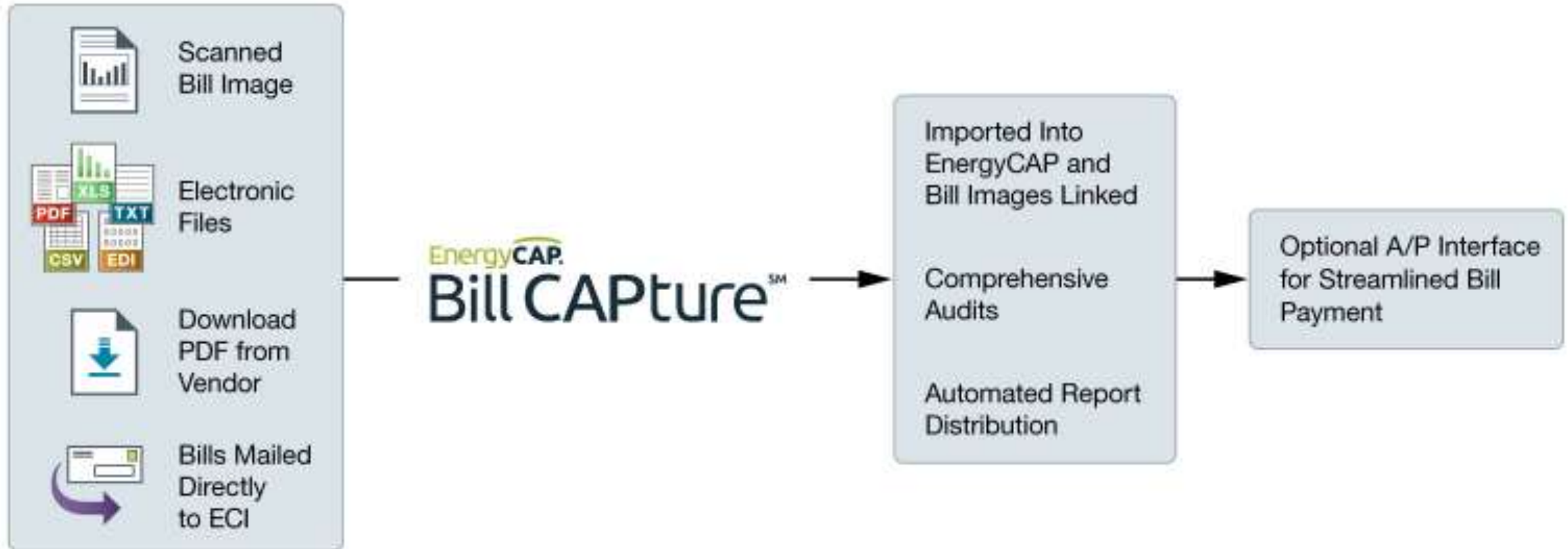
Sable Water Consumption



Sable Waste, Recycle, Compost



Bill CAPture



Bill CAPture

Buildings & Meters

- > Lyn Knoll ES
- > Montview ES
- > Paris ES
- > Park Lane ES
- > Peoria ES
- ▼ Sable ES
 - ⚡ Sable ES-Ele1
 - 🔥 Sable ES-Nat1
 - 🔥 Sable ES-Nat2
 - 🌿 Sable ES-Post
 - ♻️ Sable ES-Recycle
 - 🗑️ Sable ES-Refuse
 - 🚰 Sable ES-Wtr1

... > Elementary Schools > Sable ES > ⚡ Sable ES-Ele1 [3017]

Bills Actual Data Calendarized Data Normalized Data Inter

1 bills selected

< 1 - 86 of 86 >

\$ 416,811.62 Total Cost of 86 Bills

	Account Code	Billing Period
<input checked="" type="checkbox"/>	53-7500337-3	Aug 2019
<input type="checkbox"/>	53-7500337-3	Jul 2019
<input type="checkbox"/>	53-7500337-3	Jun 2019
<input type="checkbox"/>	53-7500337-3	May 2019
<input type="checkbox"/>	53-7500337-3	Apr 2019

DBID:98328 BBID:642571 BID:1449942 CID:59 VID:196 CAID:7437 RECEIVED ON:08/27/2019:10:33.12

PUBLIC SERVICE COMPANY OF COLORADO

Xcel Energy®
RESPONSIBLE BY NATURE®

138

SERVICE ADDRESS		ACCOUNT NUMBER	DUE DATE
APS - SABLE ELEMENTARY SCHOOL 2801 SABLE BLVD AURORA, CO 80011-2418		53-7500337-3	09/10/2019
STATEMENT NUMBER	STATEMENT DATE	AMOUNT DUE	
650579267	08/20/2019	\$6,844.59	

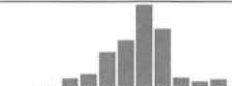
DAILY AVERAGES

	Last Year	This Year
Temperature	73° F	75° F
Electricity kWh	1426.2	1471.0
Electricity Cost	\$192.86	\$219.54

SUMMARY OF CURRENT CHARGES (detailed charges begin on page 2)

Electricity Service	07/19/19 - 08/19/19	45600 kWh	\$6,805.68
Natural Gas Service	07/22/19 - 08/20/19	0 therms	\$38.91
Current Charges			\$6,844.59

YOUR MONTHLY NATURAL GAS USAGE



ACCOUNT BALANCE (Balance de su cuenta)

Previous Balance	As of 07/19	\$4,897.98
Payment Received	Check 08/07	-\$4,897.98 CR
Balance Forward		\$0.00
Current Charges		\$6,844.59

QUESTIONS
See our website for more information.
Email us at customer.service@xcelenergy.com
Please call us at 1-800-4-A-ENERGY
Hearing impaired? Please call 1-800-4-A-ENERGY
Fax: 303-733-7333
Or write to: Xcel Energy, 2001 Sable Blvd, Aurora, CO 80011


Item	Amount	Account	Invoice number	Accounting period	Statement date
Sable ES (33-7500337-3)		2801 Sable Blvd, Aurora, CO 80011	650579267	08/2019	08/20/2019
2001 Sable Blvd, Aurora, CO 80011			1449942_XCELENERGY_53-7500337-3_20190820	08/2019	08/20/2019

Total Cost
due 09/10/2019 \$ **6844.59**

Item	Amount	Account	Invoice number	Accounting period	Statement date
Demand	219.64 kW				
Billable Demand	220 kW				
Service & Facility					
Customer Charge	\$				
Secondary General	45600 kWh	\$			
Use					
Elec Commodity Adj	45600 kWh	\$			
Info Use					
Distribution Demand	220 kW	\$			
Distribution Demand					
Gen & Transm Demand	220 kW	\$			
Transmission Demand					
Trans Cost Adj	220 kW	\$			
Info Demand					
Demand Side Mgmt Cost	220 kW	\$			
Info Demand					
Purch Cap Cost Adj	220 kW	\$			
Info Demand					
CACJA	220 kW	\$			
Info Demand					



Thornton Weather




ThorntonWeather.com

Local weather for Thornton & Denver, Colorado

[Home](#) [News](#) [Contact Us](#) [Search](#) [Mobile](#)

Thornton, Colorado, USA

Updated: 9/3/2019 2:15:18pm
Wind:  E Calm **81°F**

Navigation

- Home
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- Forecasts
- Live Conditions
- Weather Webcams
- Radar & Maps
- Lightning
- Severe Weather
- Winter Weather
- Almanac
- Weather Education
- Area Information
- About Us
- Weather Links
- Search Site
- Donate

Heating & Cooling Degree Days (°F) (65°F Base)

Data last updated 9/3/2019 2:00 PM.

Other Monthly Summary Reports

[Temperature](#) [Rain](#) [Wind](#) [Snow](#) [Barometric Pressure](#) [Sunshine](#) [Solar](#) [UV](#) [Dew Point](#) [Wet Bulb](#)

Daily Detail Reports

[Temperature](#) [Rain](#) [Wind](#) [Snow](#) [Barometric Pressure](#) [Degree Days](#) [Sunshine](#) [Solar](#) [UV](#) [Dew Point](#) [Wet Bulb](#)

Date	Heating Degree Days												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
2019	1044.0 ↓	1080.8 ↑	924.5 ↑	461.5 ↓	407.9 ↑	64.6 ↑	0.0 ↓	0.0 ↓	1.1* ↓	—	—	—	3984.4* ↓
2018	992.5 ↓	1000.4 ↑	691.5 ↑	500.4 ↓	172.0 ↓	13.2 ↓	1.1 ↓	14.2 ↑	92.2 ↓	557.7 ↑	845.0 ↑	1059.2 ↓	5939.4 ↑
2017	1098.3 ↑	696.4 ↓	516.0 ↓	461.6 ↓	296.9 ↑	23.8 ↓	0.0 ↓	16.2 ↑	149.8 ↑	505.8 ↑	624.7 ↓	1026.9 ↓	5416.4 ↓
2016	1067.2 ↑	765.7 ↓	728.5 ↑	508.3 ↑	337.6 ↑	5.3 ↓	0.0 ↓	20.8 ↑	91.9 ↓	284.7 ↓	630.4 ↓	1142.7 ↓	5583.1 ↓
2015	969.3 ↓	858.7 ↓	623.0 ↓	478.9 ↓	398.2 ↑	17.2 ↓	9.5 ↑	14.6 ↑	15.3 ↓	331.8 ↓	841.1 ↑	1103.7 ↓	5661.3 ↓
2014	1042.9 ↓	1020.5 ↓	738.9 ↑	461.1 ↓	271.1 ↓	38.5 ↑	9.4 ↑	13.2 ↑	118.1 ↑	379.2 ↓	896.5 ↑	1108.3 ↓	6097.7 ↑
2013	1091.9 ↑	970.4 ↑	826.9 ↑	680.9 ↑	255.9 ↓	26.9 ↓	3.1 ↓	0.9 ↓	110.4 ↑	590.5 ↑	761.0 ↓	1108.2 ↓	6427.0 ↑
2012	876.9 ↓	1029.5 ↓	476.9 ↓	333.3 ↓	185.6 ↓	2.0 ↓	0.0 ↓	1.9 ↓	101.3 ↑	538.5 ↑	714.8 ↓	1066.3 ↓	5327.0 ↓
2011	1087.6 ↑	990.2 ↑	649.2 ↓	506.8 ↑	381.1 ↑	28.2 ↓	0.0 ↓	0.0 ↓	125.4 ↑	452.1 ↑	773.8 ↑	1191.2 ↓	6185.6 ↑
2010	1126.6 ↑	1022.5 ↓	755.6 ↑	506.4 ↑	341.8 ↑	43.7 ↑	11.6 ↑	0.4 ↓	48.9 ↓	377.7 ↓	843.9 ↑	962.5 ↓	6041.6 ↑
2009	930.1 ↓	761.9 ↓	687.6 ↓	563.4 ↑	212.4 ↓	103.1 ↑	21.1 ↑	14.7 ↑	144.2 ↑	710.0 ↑	758.5 ↓	1273.7 ↓	6180.7 ↑
2008	1138.7 ↑	870.6* ↓	763.4 ↑	518.2 ↑	275.8 ↓	47.6 ↑	0.0 ↓	35.1 ↑	161.0 ↑	476.1 ↑	682.8 ↓	1135.1 ↓	6104.4* ↑
2007	1307.9 ↑	956.8 ↑	583.0 ↓	525.8 ↑	217.3 ↓	37.1 ↑	0.0 ↓	1.4 ↓	101.8 ↑	408.4 ↓	741.3 ↓	1178.5 ↓	6059.3 ↑
2006	—	—	—	—	—	—	—	—	—	146.4* ↓	782.4 ↑	1050.4 ↓	1979.2* ↓
Avg	1059.5	925.0	689.6	500.5	288.7	34.7	4.3	10.3	97.0	443.0	761.2	1108.2	5922.0

Date	Cooling Degree Days											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

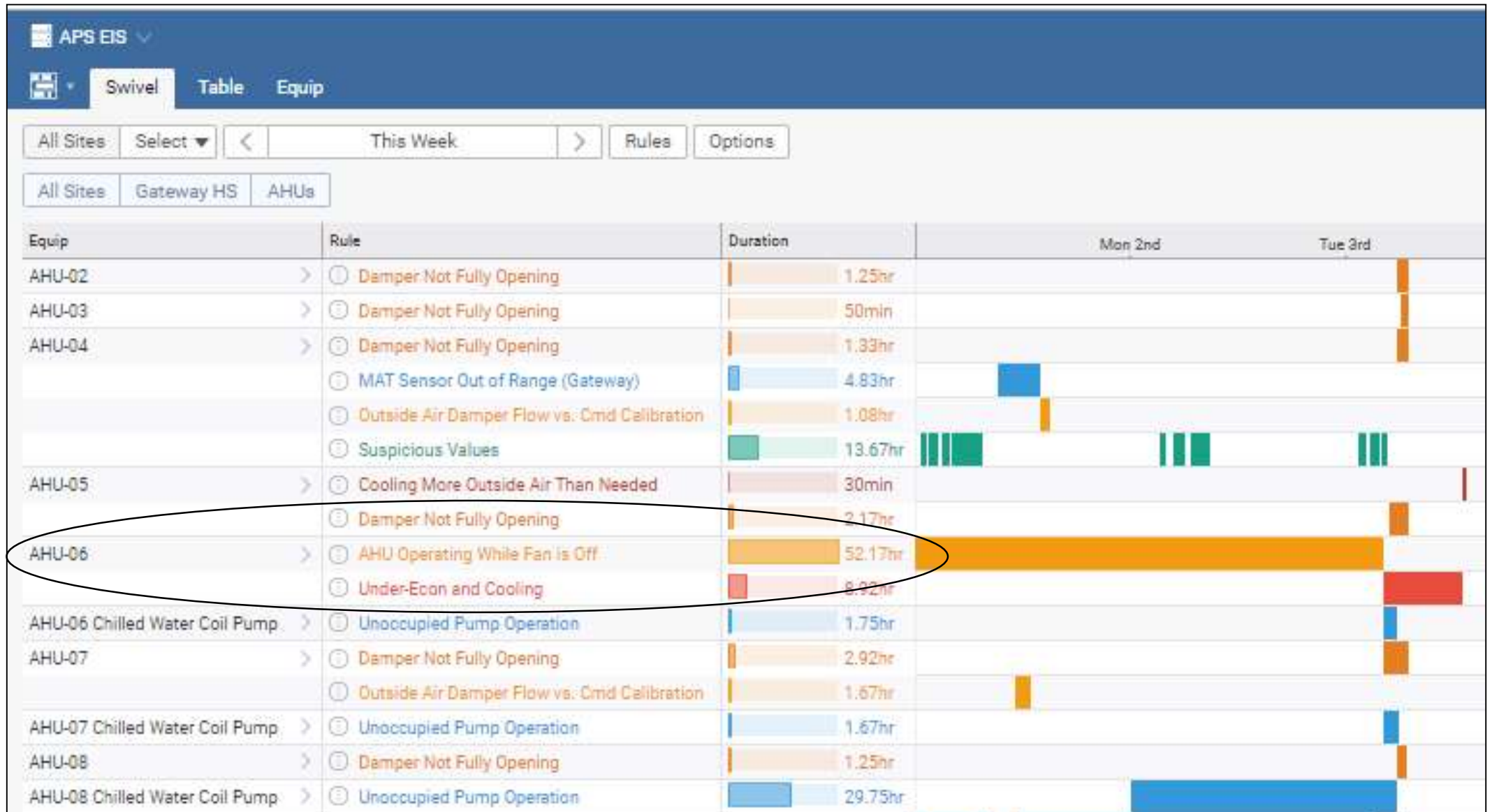
Active Alerts

NONE

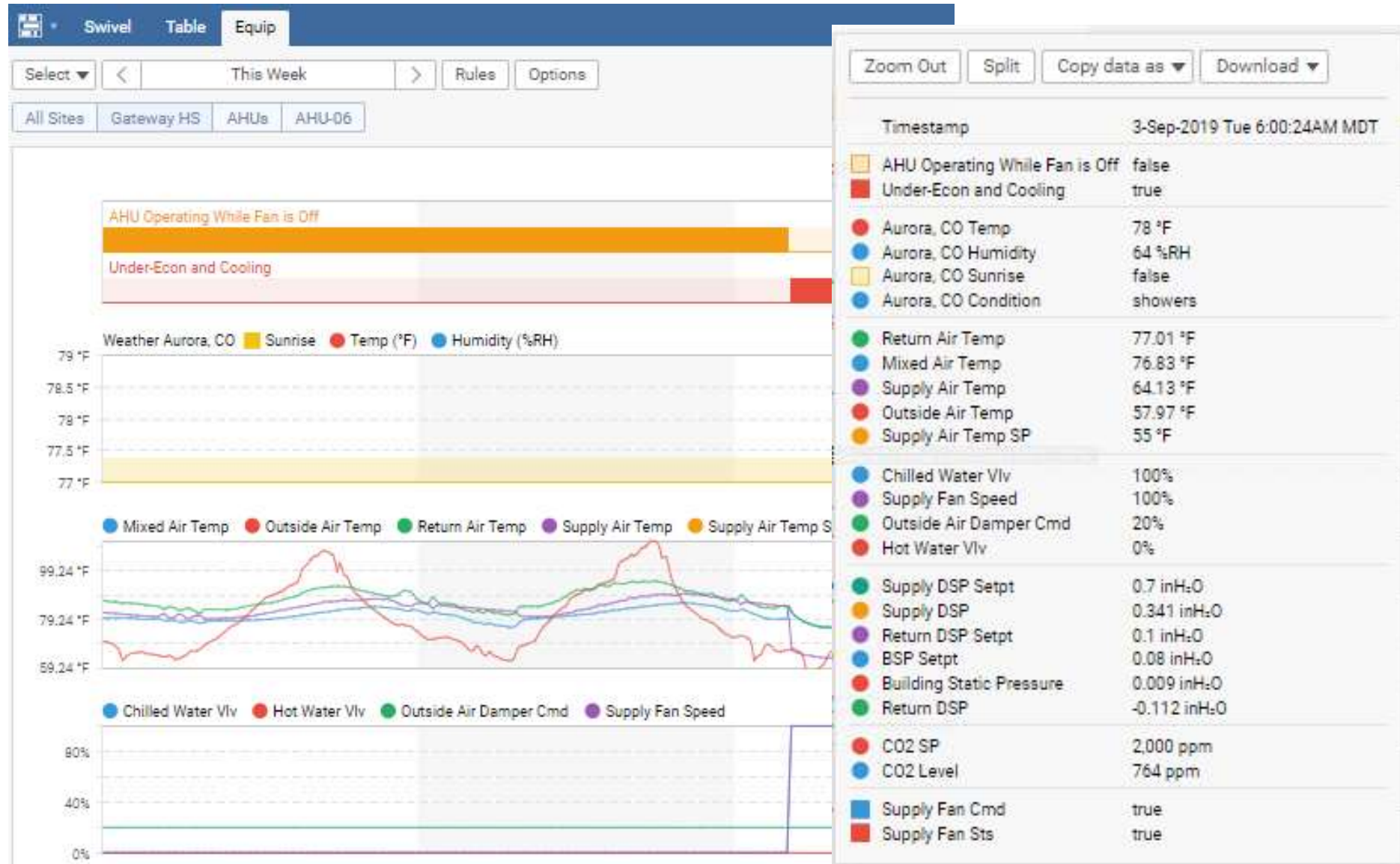
[Twitter](#) [Connect](#)



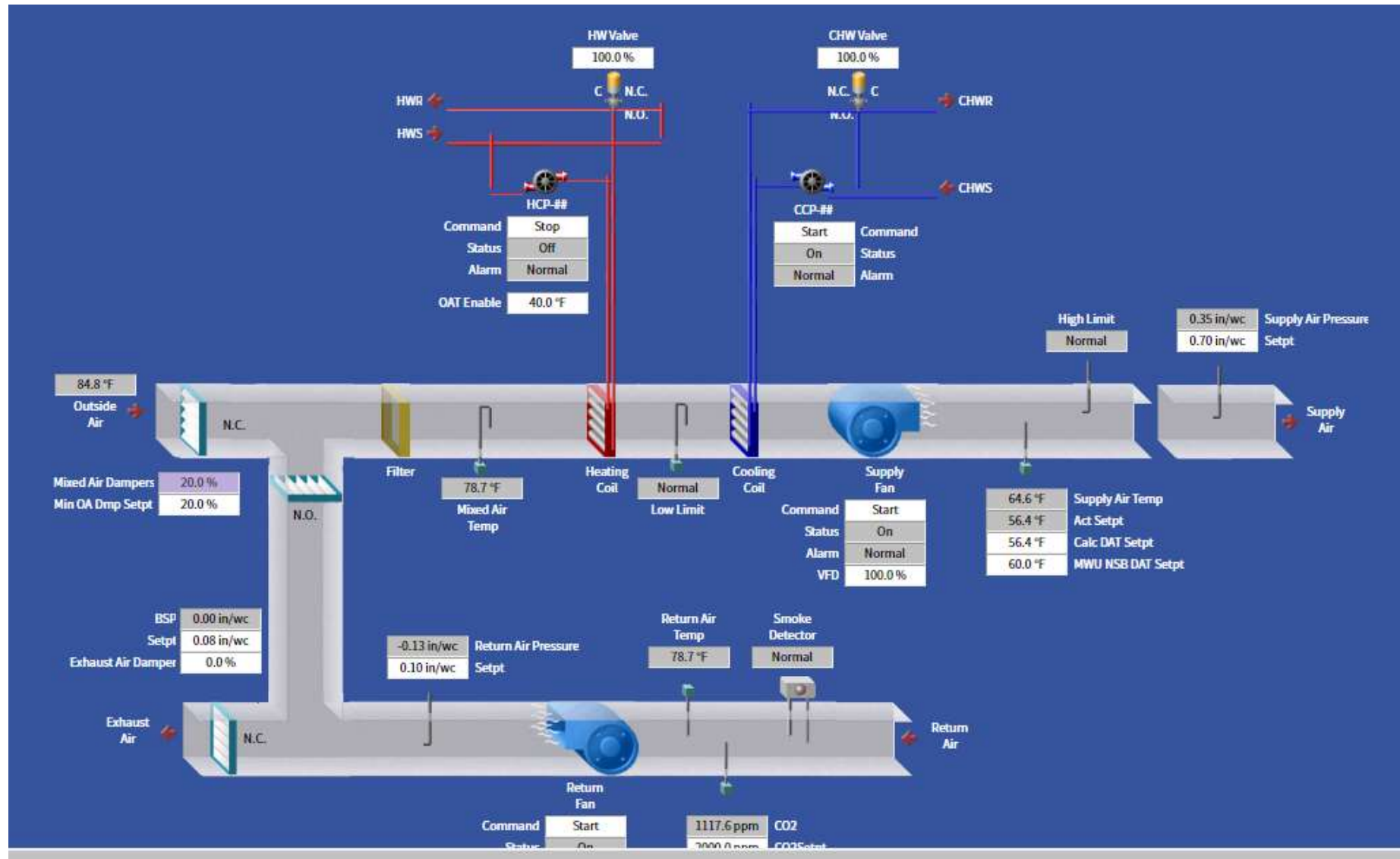
SkySpark



SkySpark





Niagara




SkySpark



School Dude



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 [Advanced Search](#) [Services](#) | [Help](#)

Actions: [Add](#) | [List](#) | [Graph](#) | [Report](#)

[Work Order](#) [Shortcuts](#) [Related Links](#) [Legend](#)

[Add/Update Work Order](#)

Work Order: NEW

Status ☒

Priority ☒

Created By
Craig Wright

Date Created


Status Date

Request Info

Location

Building

Area

Request Date ☒
 

Request Description ☒

Area Number

☐ **Emergency?**



Air Pressure Meter



Portable Power Meter



Favorite Tool



The End



1. SAFETY for humans

2. SAFETY for equipment & systems

3. Energy, Water, Waste Diversion Measures do not mess with building Occupants mission

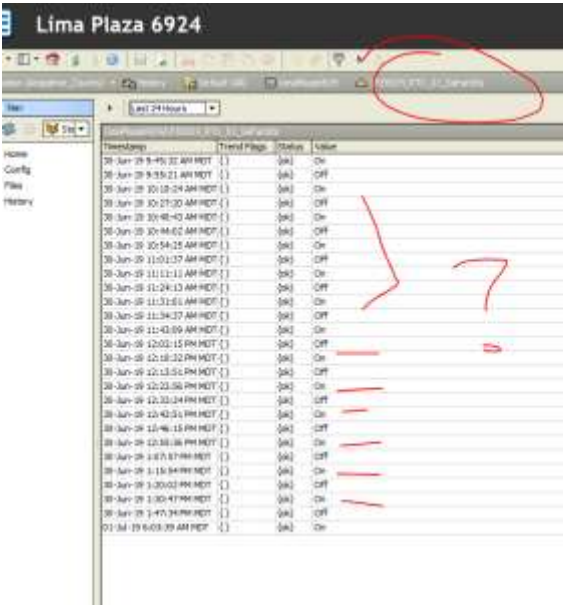
4. Have Fun. Stay Professional. Shrug off the haters 😊

“Tools” used daily...

TEST and visually site verify all

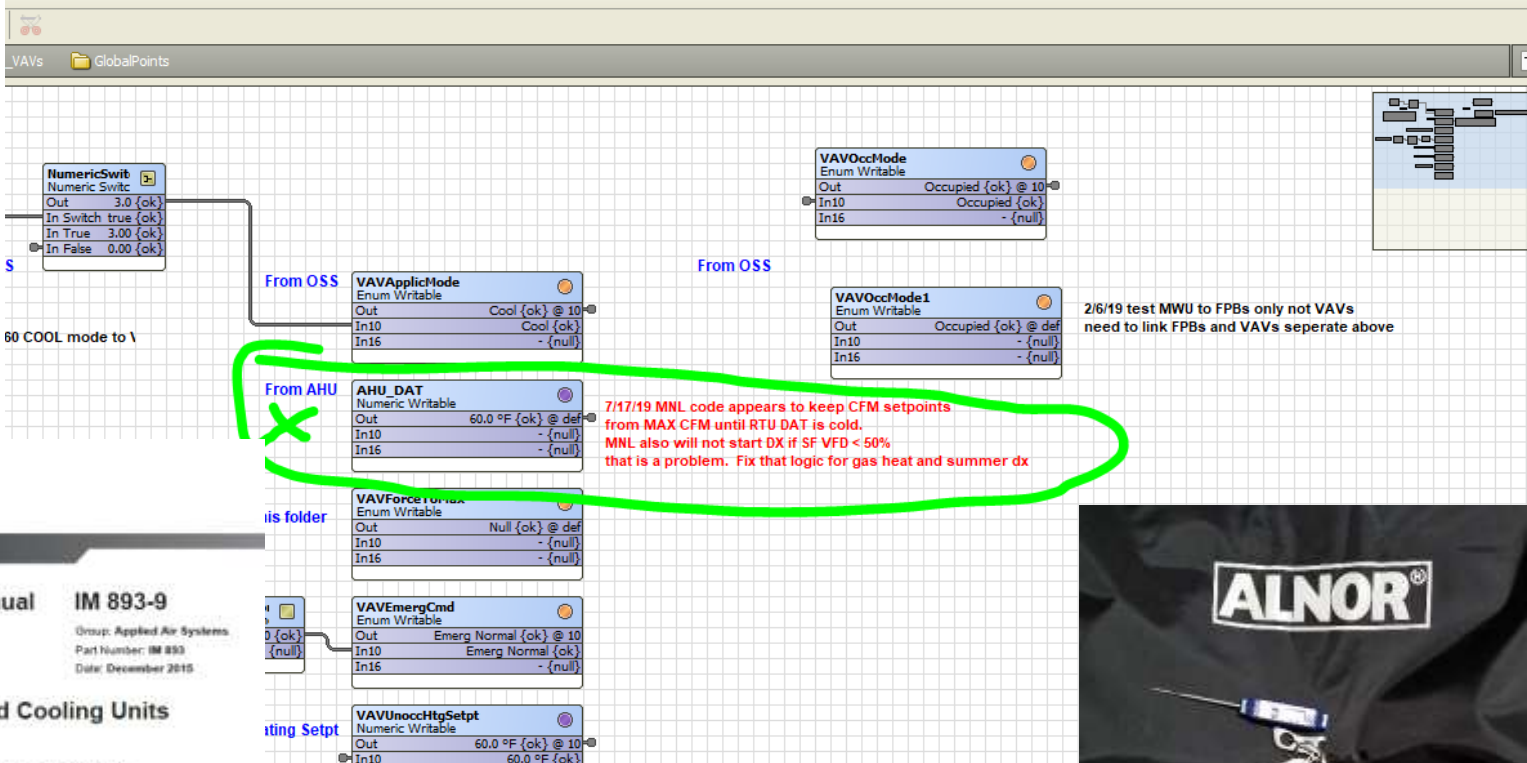


Cannot assume



Installation and Maintenance Manual IM 893-9
Group: Applied Air Systems
Part Number: IM 893
Date: December 2015

RoofPak™ Singlezone Heating and Cooling Units
RPS/RDT/RFS/RCS 015D—140D
with MicroTech® III Unit Controller and Refrigerant R-410A



UNIT DATA	
Make	McQuay
Model	RPS105CLA
Serial Number	FBOU010700414 02
Arr./Class	Blow Through
Discharge	Horizontal
Make Sheave	Browning
Sheave Diam./Bore	3B160/2 15/16"
No. Belts/make/size	3/Opt/BX136
No. Filters/type/size	33/Pleated/24x15x2
No. Filters/type/size	11/Pleated/20x15x2

MOTOR	
Make/Frame	Baldor
H. P. /RPM	60/1725
Volts/Phase/Hertz	230/4
F. L. Amps/S. F.	144/7.5
Make Sheave	Browning
Sheave Diam/Bore	3B5V110/2 3/8"
Sheave Distance	48 1/4"

TEST DATA	DESIGN	ACTUAL
Total CFM	44,250	47,185
Total S. P.	5.11	5.19
Fan RPM	NG	1220
Motor Volts	460	468/470/470
Motor Amps	72	63.5/73.5/71.1
Outside Air CFM	4760	5076
Return Air CFM	39,490	42,109

TEST DATA	DESIGN	ACTUAL
Discharge S. P.		2.75
Suction S. P.		-2.44
Reheat Coil S. P.		
Cooling Coil S. P.		2.75/2.04/7.1
Preheat Coil S. P.		
Filters S. P.		-2.25/-2.44/1.19





County Fair Sustainability Team Awareness for Energy, Water, Waste Diversion



MANDATED
WATER
RESTRICTIONS
IN EFFECT



Arapahoe County Facilities and Fleet Management
303-750-4579 • Feedback@arapahoe.org

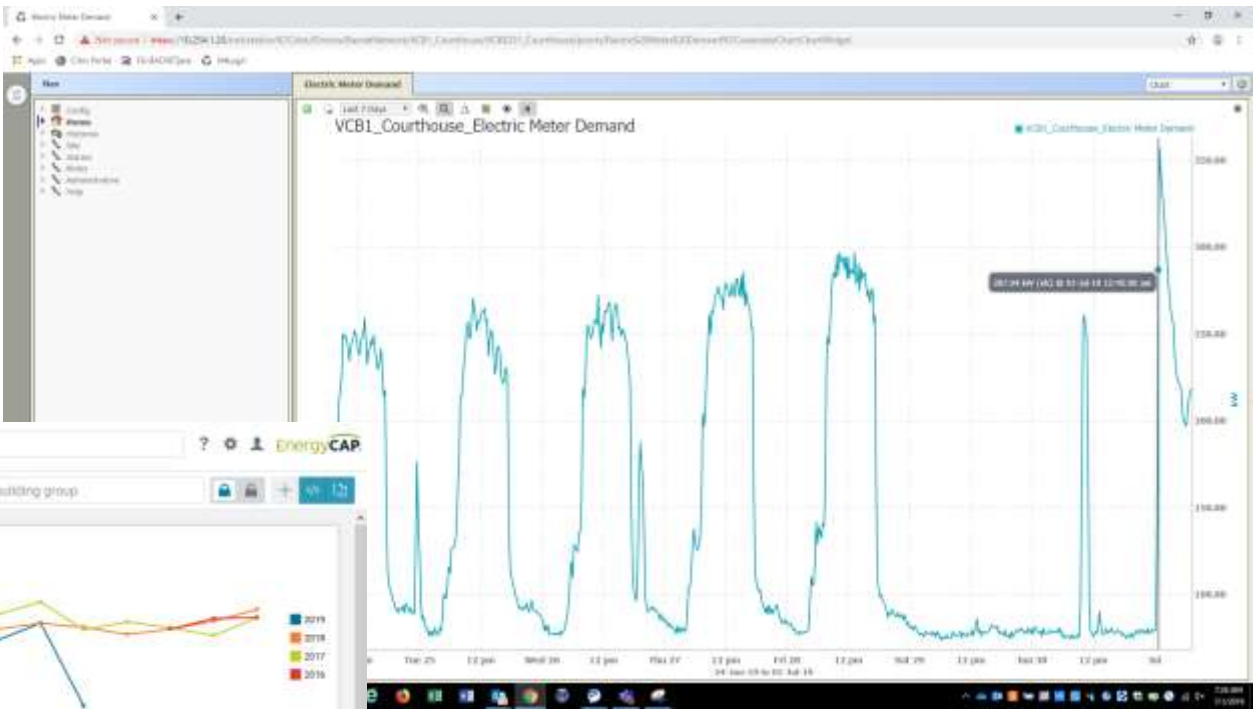
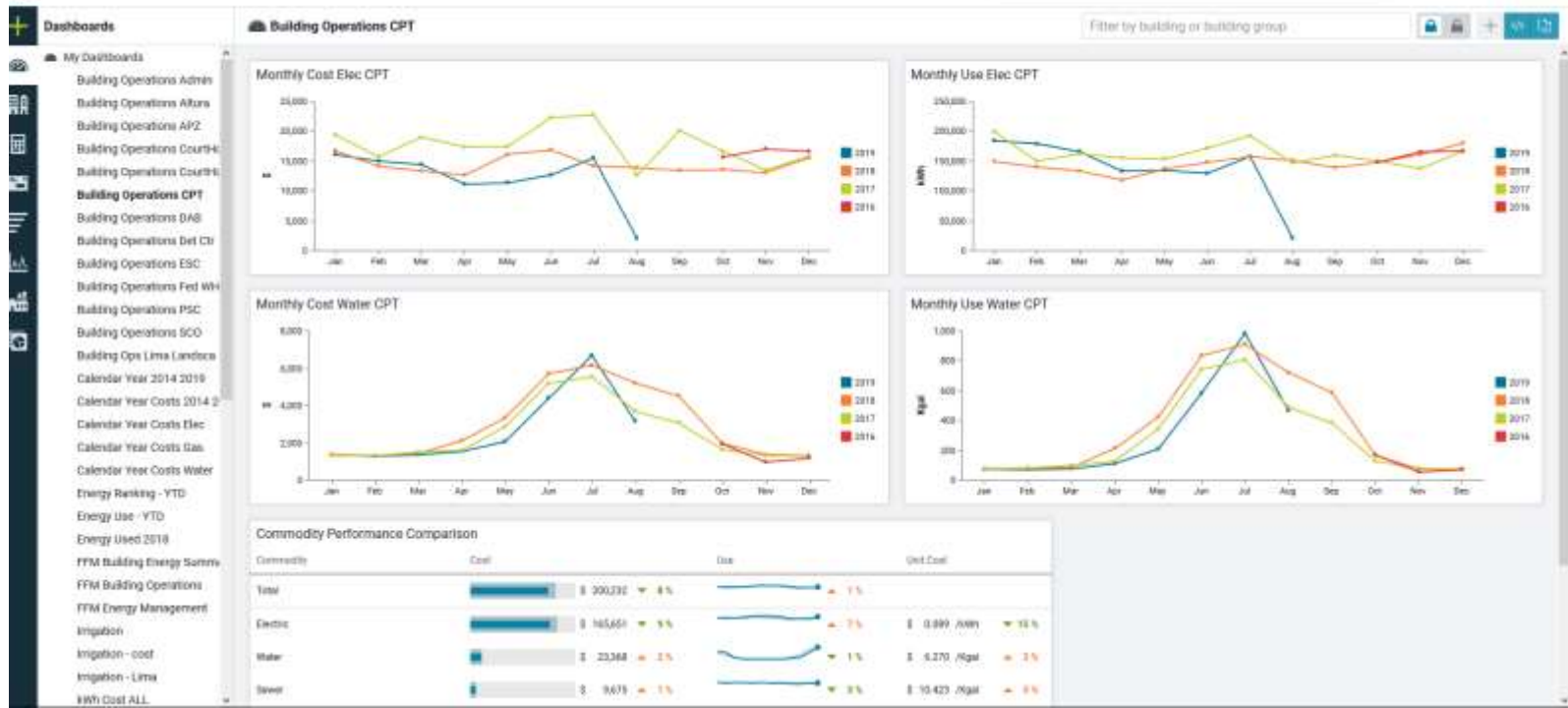


Arapahoe County Facilities and Fleet Management
www.arapahoe.org

Promote Energy & Water consumption and cost with Facilities staff.... Hopeful some will take an interest 😊

Utility meter Interval data is so very cool!

Poor mans dashboard share with Maint, Controls, & HVAC techs and building supervisors.



Programmed interval data alerts in Tridium wiresheet to email if meter measures a spike.

I thought pretty cool NO COST helper....

Sadly one HVAC Preventive Maintenance tech told me to remove alerts since it annoyed him ☹️

Even after I explained we pay \$20 per peak kW and an accidental 20kW increase for 15 minutes costs us \$400...Our buildings are not pharmacies or surgical suites.

Delete

Respond

Quick Steps


Move

Tags

Editing

Zoom

OneNote



hvacalarms_N4@arapahoegov.com

David Shaw; Keith Jones; Dawn Smith; John Hall; John Judge; Randy Bonel

Niagara Alarm From Alt_Plz_kW_Hi_Alert

Retention Policy ACG 24 Months (2 years)

Expires 9/2/2021

Source: Alt_Plz_kW_Hi_Alert

Timestamp: 03-Sep-19 1:00:04 PM MDT

Normal Time: null

State: Offnormal / Unacked

Alarm Class: Critical_Alarms

Text: Electric meter indicates kW is high
above normal for 15 minutes. 150 kW for hot peak summer.

Alarm Value: true

Present Value: true

Most important tool I use is my
RADIO to **keep calm &
stay smiling**



Employee A “I am freezing!” same time
Employee B next cubicle “I am Hot!”

Employee A “the office grass is dying!” same time
Employee B “we are wasting water!”

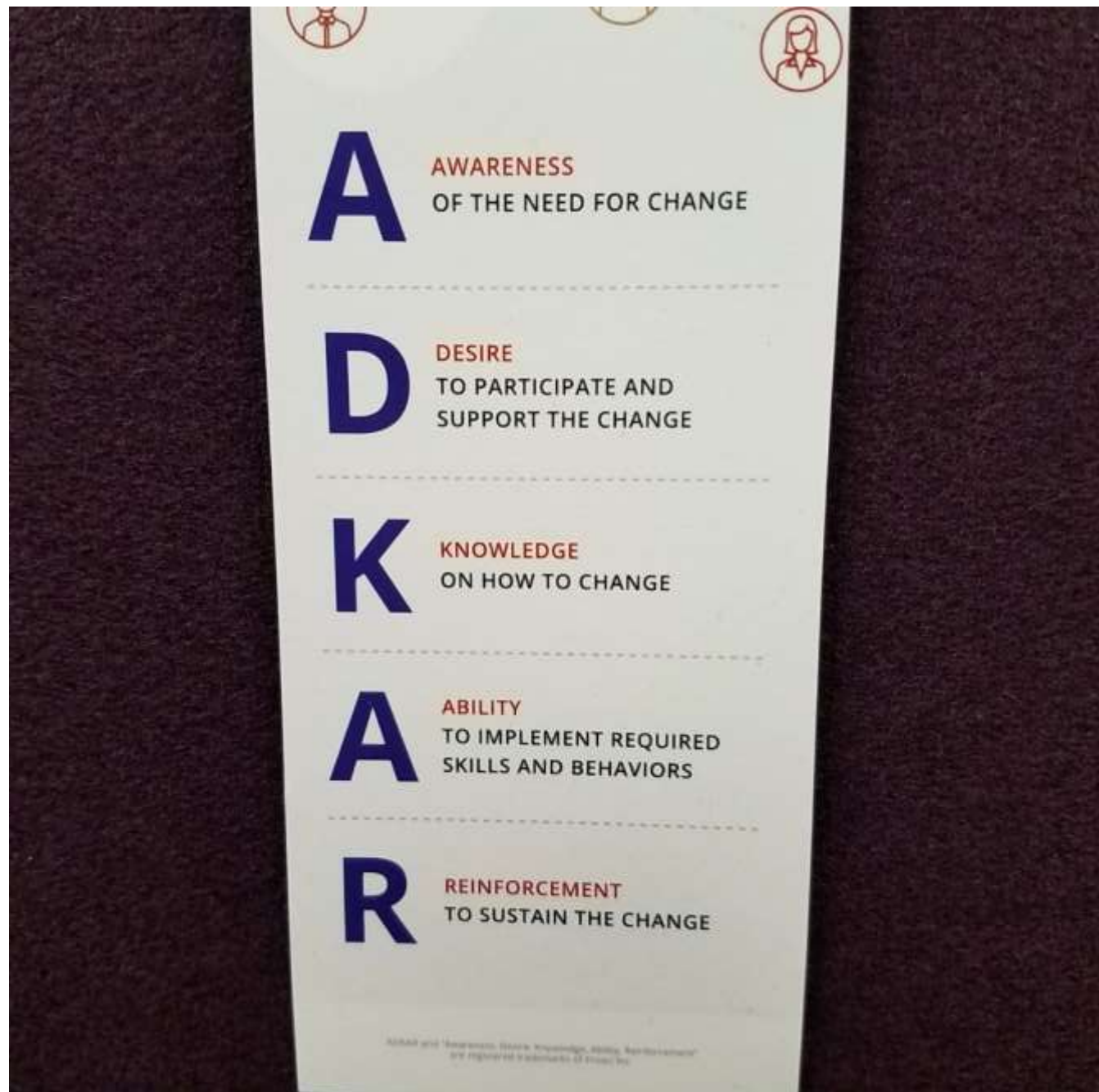


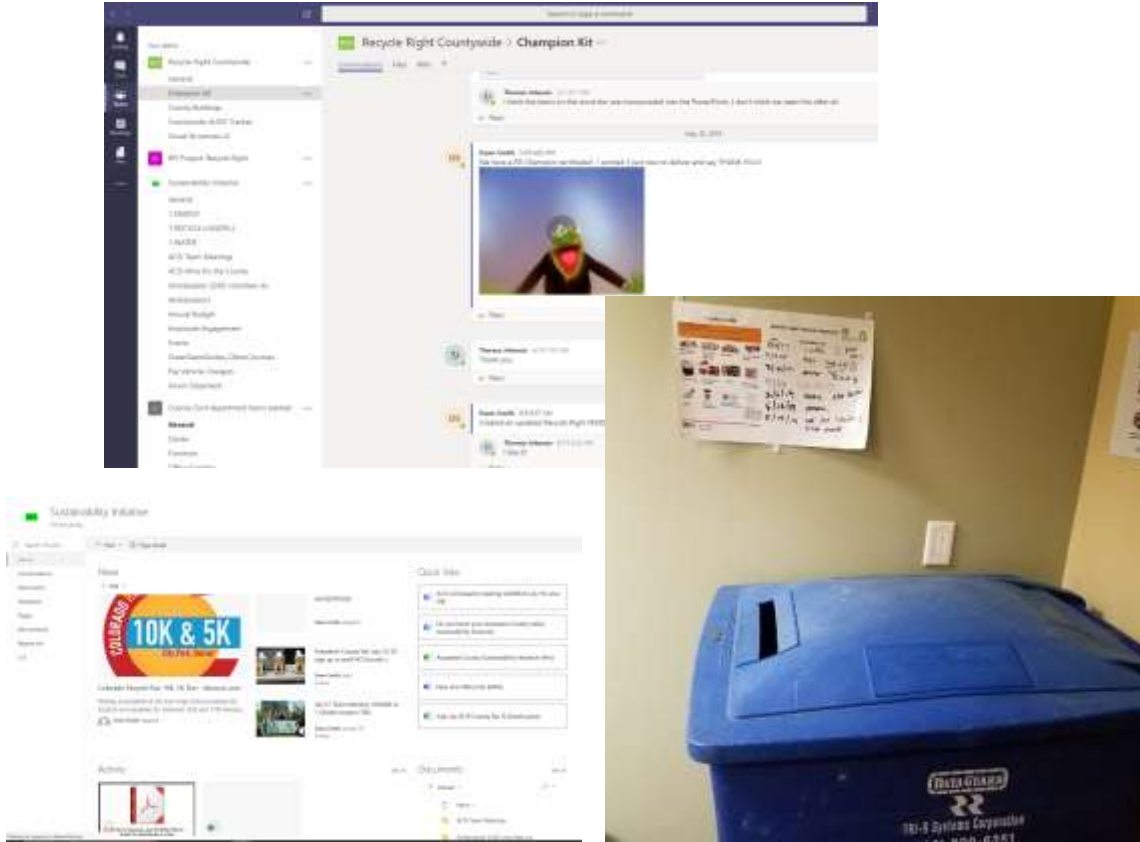


Hmm RADIO, real coffee cups, and plastic lined coffee cups.. ☹️

Wishful recycling?

Human Behavior training

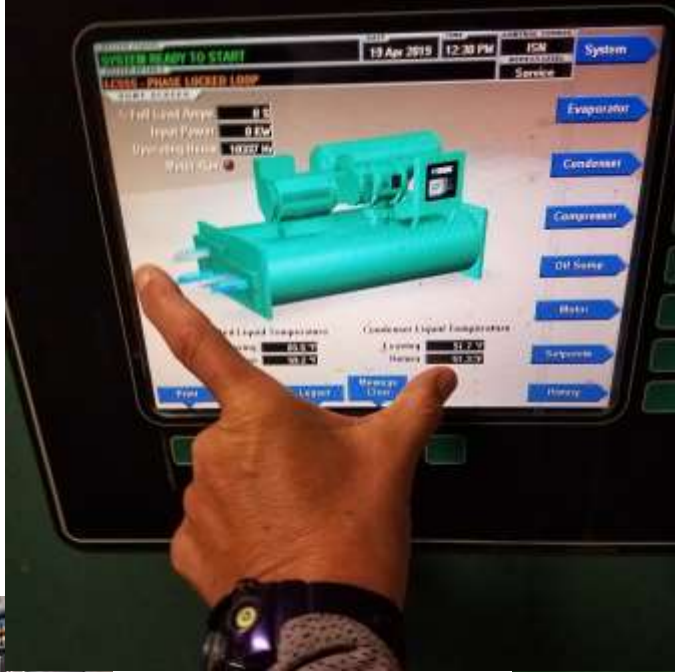




Sustainability Volunteer Team promotes ALL EMPLOYEE engagement for Water, Energy, or Waste Diversion.

When employees are aware they understand and help ☺







We all have similar existing building challenges....

Stay strong when you see
NEW remodel or construction
issues and everyone wants to
close out the project 😊

