

# Cambrian School District:

Energy and Water Optimization  
Project:  
Investment Grade Audit 90%



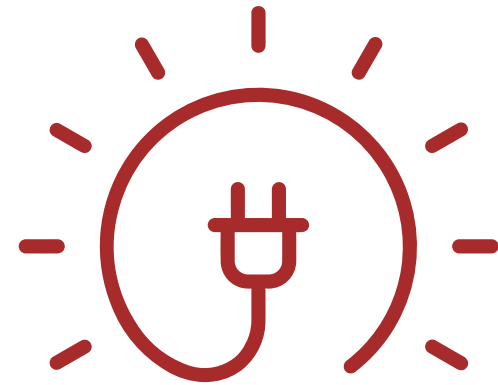
September 21, 2023



**centrica**  
Business Solutions

# Agenda

- Executive Summary
- Project Snapshot
- Energy Conservation Measures (ECM)
- Drop Ceiling Discussion
- Project Financials
- Schedule / Milestones



## Executive Summary

- Upgrade all lighting at the District, both interior and exterior, incorporating Title24 Energy Code compliant controls, LED technology, and new look fixtures
  - More energy efficient, less cost to operate
  - Visible upgrade will improve aesthetics to students and employees
  - Higher quality lighting system that will improve student and faculty experience in the facilities
- Increase solar production at 6 sites and take advantage of Inflation Reduction Act incentives
- Install District-wide irrigation controls for better management of exterior water use
- Install touch-free plumbing fixtures to comply with current and future water conservation mandates, and reduce the spread of germs
- EV Chargers at all schools and the District Office
- **Paid for through utility savings**
- **Net savings of over \$18 million over 20 years**
- **Reducing Greenhouse Gas Emissions by 918 tons**
- **Saving over 740,000 gallons of water annually.**







## 90% Snapshot

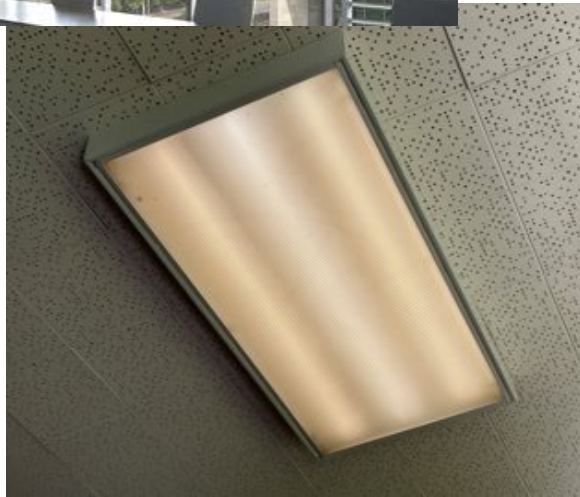
### Investment Grade Analysis

Project Financials	
Proposed Project Investment	\$7,285,889
Utility Savings % (savings/utility cost)	40%
Year 1 Utility Cost Savings	\$322,156
Year 1 Maintenance Cost Savings	\$101,919
Inflation Reduction Act, DirectPay for ITC for Tax-Exempt Entities/State Governments	\$1,009,527
Net Project Investment (after incentives & DirectPay)	\$6,276,363
Annual Greenhouse Gas Emissions (tons)	918
Equivalent Number Passenger Vehicles per Year	185
Equivalent Number of Trees Planted to Offset Tons of CO2	42,228
Simple Payback	14.3





# ECM (Energy Conservation Measure) #1a – Interior/Exterior LED Lighting & Controls



Lighting costs include fixture update without hazardous material displacement.

## Affected Sites

- Bagby Elementary
- Ida Price School
- Fammatre School
- Farnham School
- Sartorette School
- District Office

## ECM Description

Replace / retrofit incandescent, fluorescent, and HID lighting with LED. Install occupancy controls where required to meet CA Title 24 energy standards.

Special scope items include RGB (multi-color spectrum) lighting in elementary school special need classrooms and RGB theatrical lighting in the multipurpose rooms.

Location	Electricity Savings (kWh)	Electricity Cost Savings	Annual Maint Savings	Total Savings	ECM Cost	Simple Payback	Greenhouse Gases Reduced (tons/yr)
Bagby Elem School	105,175	\$25,202	\$800	\$26,002	\$511,486	19.7	82
Ida Price Middle School	124,702	\$33,653	\$1,568	\$35,221	\$446,677	12.7	97
Fammatre School	67,424	\$18,194	\$599	\$18,793	\$249,786	13.3	53
Sartorette School	64,511	\$16,847	\$414	\$17,261	\$322,488	18.7	50
Farnham School	72,206	\$18,856	\$574	\$19,430	\$226,651	11.7	56
District Office	84,396	\$24,861	\$1,296	\$26,157	\$233,619	8.9	66
<b>Totals</b>	<b>518,413</b>	<b>\$137,613</b>	<b>\$5,251</b>	<b>\$142,864</b>	<b>\$1,990,707</b>	<b>13.9</b>	<b>405</b>



# Savings Over Rated Life of Lighting Equipment

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Rated life: 120,000 hours

Annual hours of use (conservative estimate):  
1,825 hours

Annual savings: \$142,864

Usable life of equipment: 65 years

**Savings Over Rated Life:**

\$9,286,160

**Savings over rated life (5% energy inflation  
rate):**

\$65,259,992





## ECM #1b – Interior/Exterior LED Lighting & Controls

- Vastly improved exterior illumination
- improved safety and security
- Dark Sky compliant







# ECM #2a – Solar Photovoltaics



## Affected Sites

- Bagby Elem School
- Ida Price School
- Steindorf Steam School
- Fammatre School
- Sartorette School
- District Office

## ECM Description

Install solar photovoltaic carport & rooftop structures to offset electric consumption. With the passing of the Inflation Reduction Act (IRA), schools can now take advantage of the DirectPay plan in which the school district will receive a payment of 30% of the cost of the solar upon installation.

Location	Electricity Savings (kWh)	Electricity Cost Savings	ECM Cost	Simple Payback	Greenhouse Gases Reduced (tons/yr)
District Office	53,840	\$19,400	\$234,535	8.5	42
Bagby Elem School	147,500	\$34,230	\$748,652	15.3	115
Ida Price Middle School	132,300	\$46,340	\$656,458	9.9	103
Fammatre School	110,500	\$18,074	\$596,249	23.1	86
Steindorf Steam School	106,700	\$39,050	\$584,554	10.5	83
Sartorette School	106,000	\$27,449	\$544,642	13.9	83
Totals	656,840	\$184,543	\$3,365,090	12.8	513
30% Solar ITC Directpay <sup>1</sup>			\$1,009,527		
Net Solar Cost			\$2,355,563		

Note 1: The DirectPay for the Solar PV from the Inflation Reduction Act is 30% of the solar cost.





# Savings Over Rated Life of Solar Equipment

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Rated life: 25 years

Annual savings: \$184,543

**Savings Over Rated Life:**

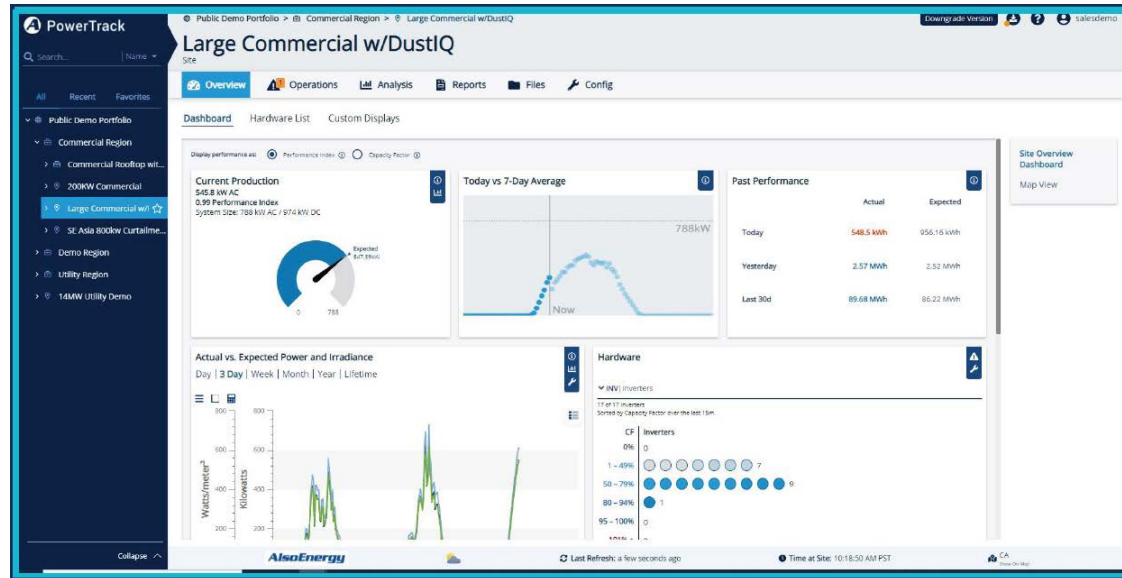
\$4,613,575

**Savings Over Rated Life with 5% energy inflation rate):**

\$8,807,702



# ECM #2b – Solar Photovoltaics Operations and Maintenance Package



## Affected Sites

- Bagby Elem School
- Ida Price School
- Steindorf Steam School
- Fammatre School
- Sartorette School
- Farnham School
- District Office

## ECM Description

- Retro-commission existing system
- Monitor and maintain existing system as well as expanded PV system on the same platform

Costs being assessed to be included in 90% IGA presentation

**PowerTrack** Public Demo Portfolio

Overview Operations Analysis Reports Files Config

Dashboard Sites

Name	DC Size	Average kW	Reminder	Availability L...	Availability	Irradiance	Now	Inverter Fail...	Expected
14MW Utility Demo	14,053.5 kW	9,696 kW		0 kWh	2 1 1 1	100 %	574 W/m²	9,676.8 kW	9,527
22MW Utility with DC Zones, Inv Control	22,743 kW	4,737.3 kW		1,109.4 kWh	3 1 1 2	93.8 %	85.3 W/m²	-35.3 kW	4,990
200kW Commercial	199.9 kW	-0.1 kW	Check Inverter 2	0 kWh	2 1 - 1	100 %	119.5 W/m²	0 kW	0
DC Coupled Utility Site w/ Storage	1,741.7 kW	106.9 kW	Check on inv 3 r	0 kWh	- 1 2 1	100 %	321.3 W/m²	85.7 kW	497
Inverter Map/Power Plant Control & V...	6,164 kW	4,495.4 kW		0 kWh	- 1 1 1	100 %	602.5 W/m²	571.3 kW	4,291
Large Commercial w/DustIQ	574 kW	-313.3 kW	Awaiting Respo...	236.1 kWh	3 - 3 2	70 %	559.1 W/m²	454 kW	3
SE Asia 800kw Curtailment Dashboard	996.5 kW	-0.1 kW		0 kWh	2 3 1 2	100 %	0 W/m²	-0 kW	4
Storage + PV Demo	357 kW	22.8 kW	Invert Comms E...	0 kWh	2 1 3 4	100 %	68.3 kW	3	0
Tracker Control	18,023.4 kW	4,385.4 kW	Shade Model	825.7 kWh	1 1 1 -	93.9 %	380.5 W/m²	-17.6 kW	4.8
Zero Net Export	2,450.2 kW	124 kW		24.4 kWh	2 1 1 -	99 %	50.3 W/m²	-0.1 kW	119

10 Sites 67.68 MW 23.88 MW 11.2 MW 24.21

Last Refresh: 23 seconds ago Current Time: 11:30:36



# ECM #3 – WeatherTrak Smart Irrigation System



## Affected Sites

- Bagby Elem School
- Sartorette School
- Farnham School
- Ida Price School
- Fammatre School
- Steindorf Steam School

## ECM Description

WeatherTrak irrigation controllers reduce water waste outdoors while keeping landscapes healthy. Weather-based irrigation controllers (WBICS) are one option to achieve water-efficient irrigation scheduling.

By using local weather data and landscape conditions to tailor water schedules, weather-based irrigation controllers determine when and how much to water.

ECM Description	Annual Maint. Savings <sup>1</sup>	ECM Cost	Simple Payback
Weathertrak System	\$96,668	\$1,281,382	13.3

Note 1: Annual Maintenance Savings for the WeatherTrak Irrigation system based on an estimated 22 hours per week for Groundskeepers and Irrigation Specialists to maintain system and review timers/valves/etc.



# ECM #4 – Hands-Free WC Operation



SLOAN.



## Affected Sites

- Bagby Elementary
- Ida Price School
- Fammatre School
- Steindorf Steam School
- Sartorette School
- Farnham School
- District Office

## ECM Description

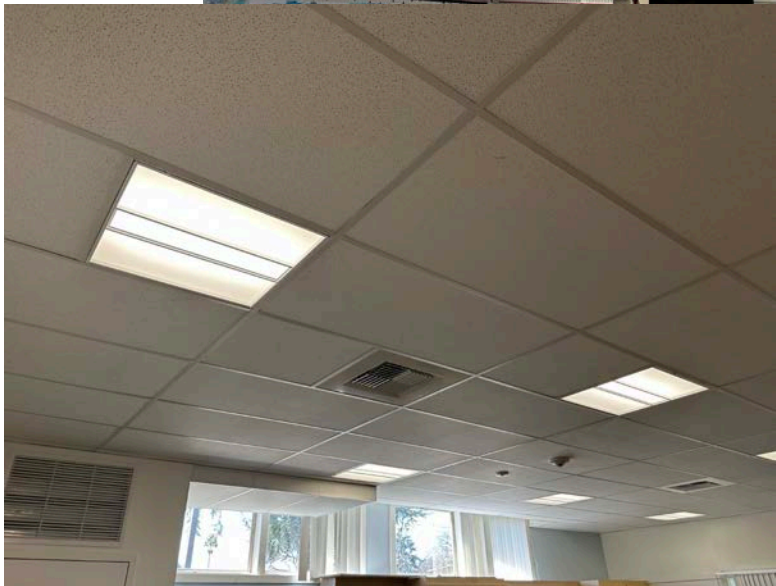
Replace faucets and flushometers for all restrooms in each facility with high efficiency touchless systems to minimize transmission of germs. Each restroom will contain one non-sensored standard operated faucet to ensure successful operation under any conditions.

ECM Description	Annual Water Savings (Gals)	Annual Savings	ECM Cost	Simple Payback
Touchless Fixtures	742,448	\$14,387	\$458,619	31.9





# Drop Ceiling Retrofit Discussion



## Affected Sites

- Bagby Elementary
- Sartorette School
- Fammatre School
- Farnham School

## ECM Description

Add drop ceilings in classrooms decreasing the space required for heating and cooling. This will include removal of all hazardous materials, installing lighting in the new ceiling as well as re-connecting ductwork for proper operation of the heating and cooling systems as well as adding additional insulation at the ceiling.

Location	Electricity Savings (kWh)	Electricity Cost Savings	Natural Gas Savings (Therms)	Gas Cost Savings	Total Savings	ECM Cost	Simple Payback	Greenhouse Gases Reduced (tons/yr)
Bagby Elem School	5,434	\$1,302	427	\$649	\$1,951	\$963,659	494.1	6
Fammatre School	5,509	\$1,487	997	\$1,329	\$2,816	\$810,195	287.8	6
Sartorette School	5,214	\$1,208	407	\$767	\$1,975	\$809,466	409.8	6
Farnham School	4,083	\$1,206	282	\$431	\$1,637	\$794,785	485.4	4
Totals	20,240	\$5,203	2,114	\$3,176	\$8,379	\$3,378,105	403.2	21

\* Due to the high simple payback; Centrica does not recommend this as an Energy Conservation Measure

# Project Financials

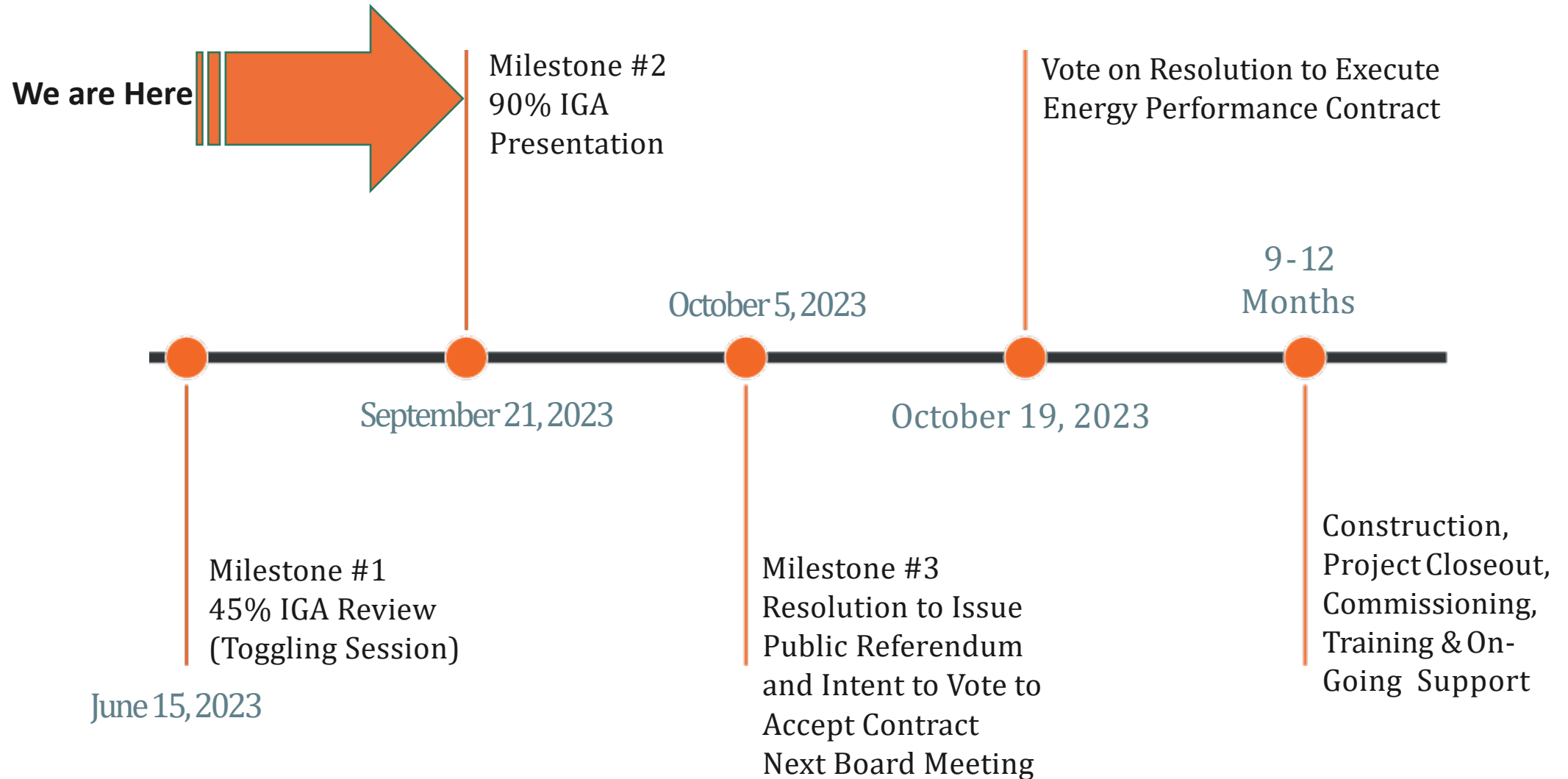
ECM #	ECM Description	Electricity Savings (kWh)	Electricity Cost Savings	Annual Maint Savings	Total Savings	ECM Cost	Simple Payback	Greenhouse Gases Reduced (tons/yr)
1	Int/Ext Lighting Retrofit & Control	518,413	\$137,613	\$5,251	\$142,864	\$1,990,707	13.9	405
2	Solar PV	656,840	\$184,543	-	\$184,543	\$3,365,090	12.8	513
3	WeatherSmart Irrigation System <sup>1</sup>	-	-	\$96,668	\$96,668	\$1,281,382	13.3	-
4	Hand's Free WC Operation	-	-	-	\$14,387	\$458,619	31.9	-
5	5yr Solar O&M Plan	-	-	-	-	\$190,092	-	-
Totals		1,175,253	\$322,156	\$101,919	\$438,462	\$7,285,889	14.3	918
30% Solar ITC DirectPay <sup>2</sup>						\$1,009,527		
Net Project Cost						\$6,276,363		

## Notes:

- 1) Annual Maintenance Savings for the WeatherSmart system based on estimated 22 hours total time spent per week for groundskeepers and Irrigation Specialists to maintain system and review timers/valves/etc.
- 2) The DirectPay for the Solar from the Inflation Reduction Act is 30% of the solar cost which is then calculated as  $\$3,365,090 \times 0.3 = \$1,009,527$  paid to the District at solar implementation. DirectPay value is based on publically available information at the time of this publication and is subject to change.



# Next Steps





# Thank you

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