

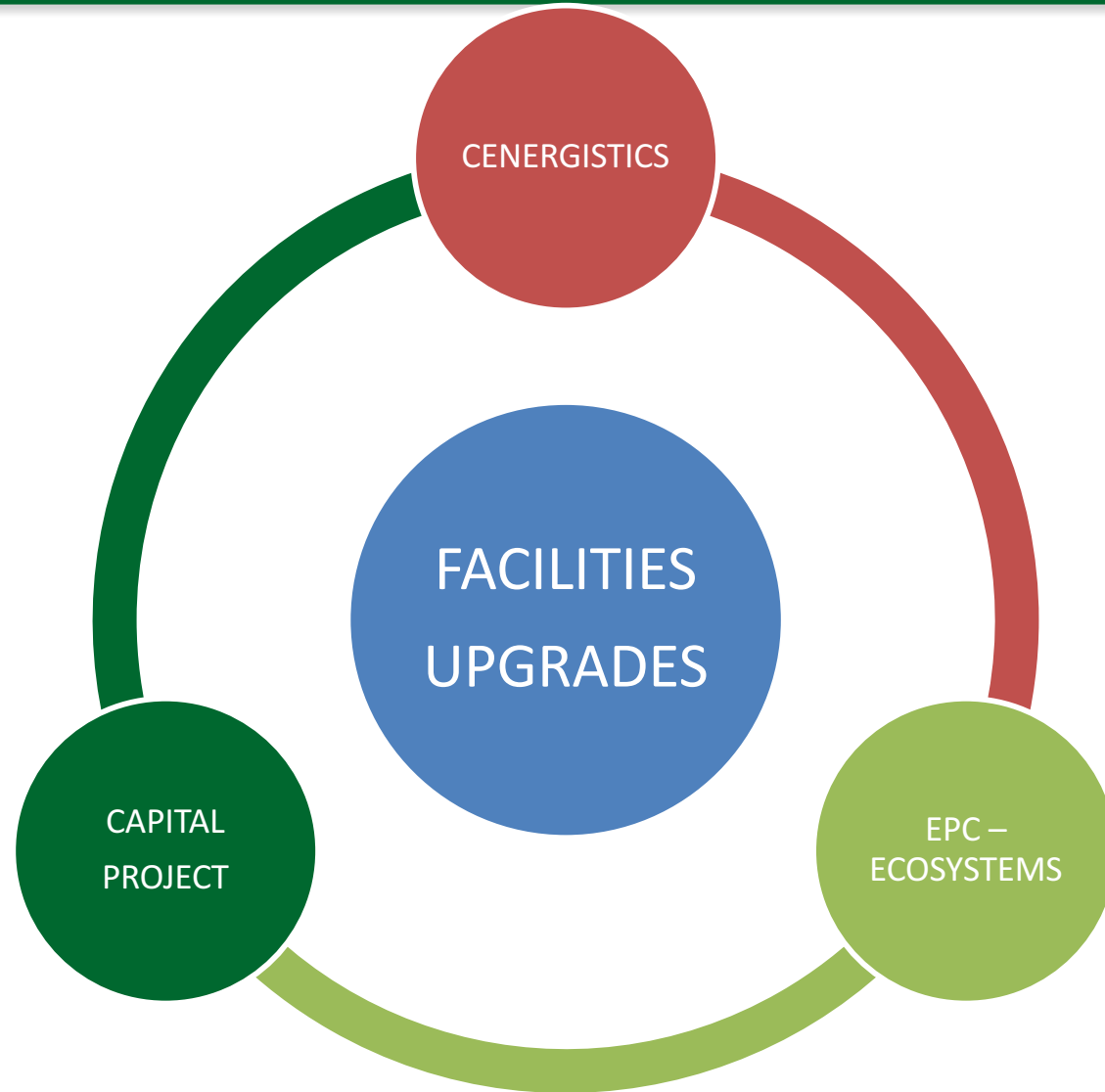
William Floyd School District

CAPITAL PROJECT REVIEW ***#3***

JUNE 27, 2017



Overview



June 27, 2017



CENERGISTICS

June 27, 2017



Efforts to Date

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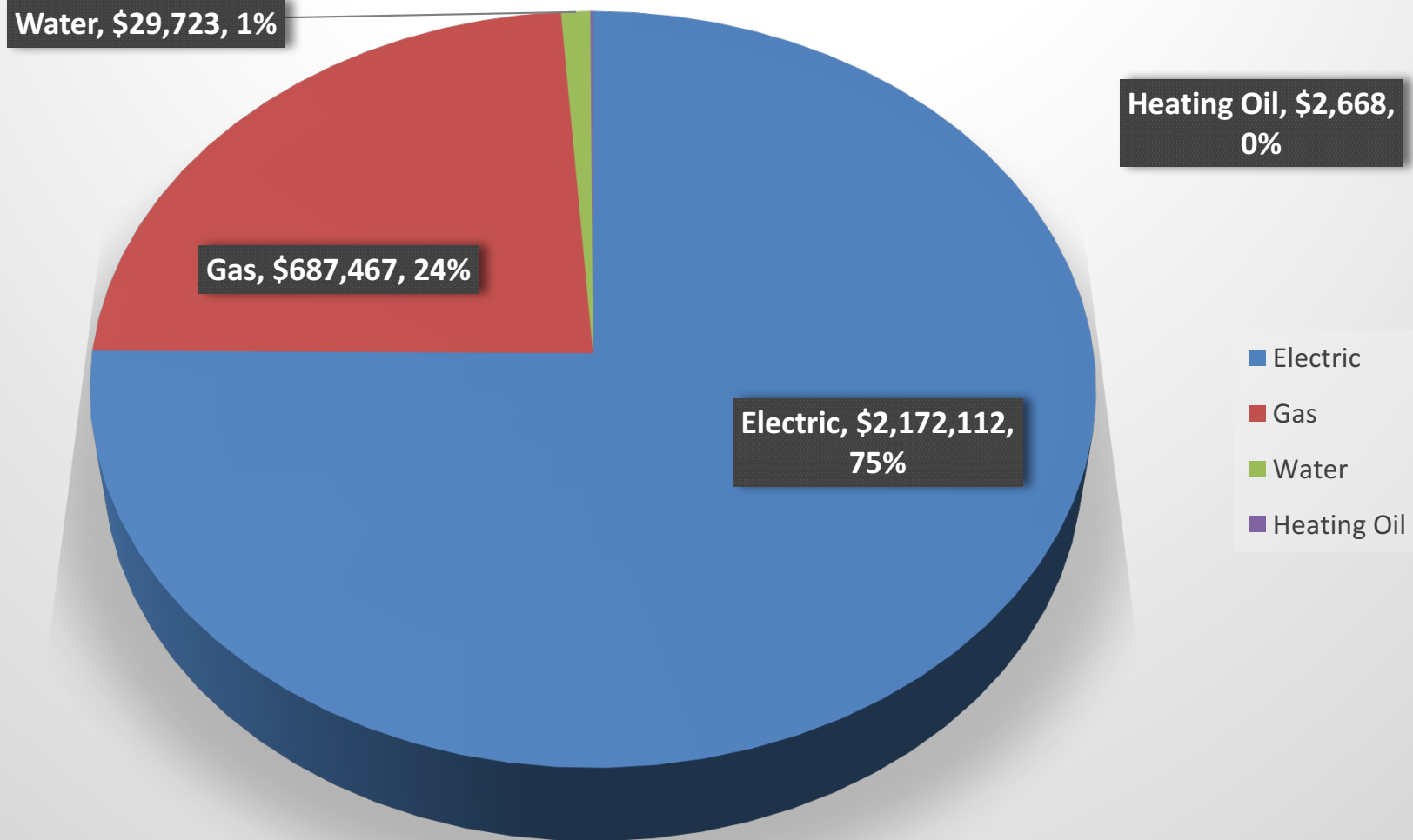
- Coordinated 5 major shutdowns
- Completed over 1,000 daily building audits
- Continuously monitor BAS for variance and compliance
- Established cohesive partnership with the operations team to identify energy conservation priorities and projects
- Continued to develop building optimization plans for each site
- Reduced William Paca Middle School building cost by 27.5%
- “Energy Start” partner and submitted application for energy star awards



Utility Cost Distribution

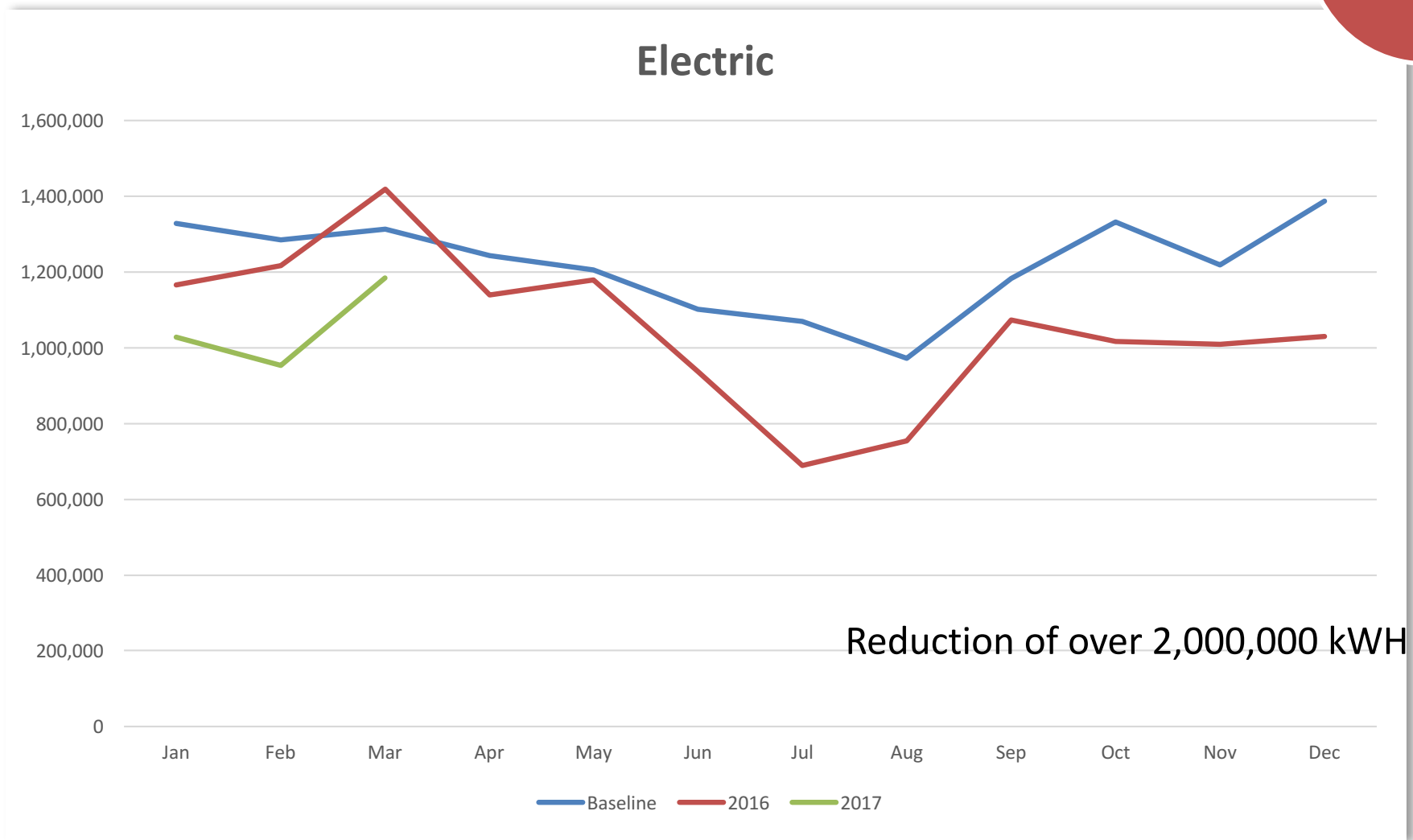
CENERGISTICS

Utility Spend (Baseline)



Energy Reduction

CENERGISTICS



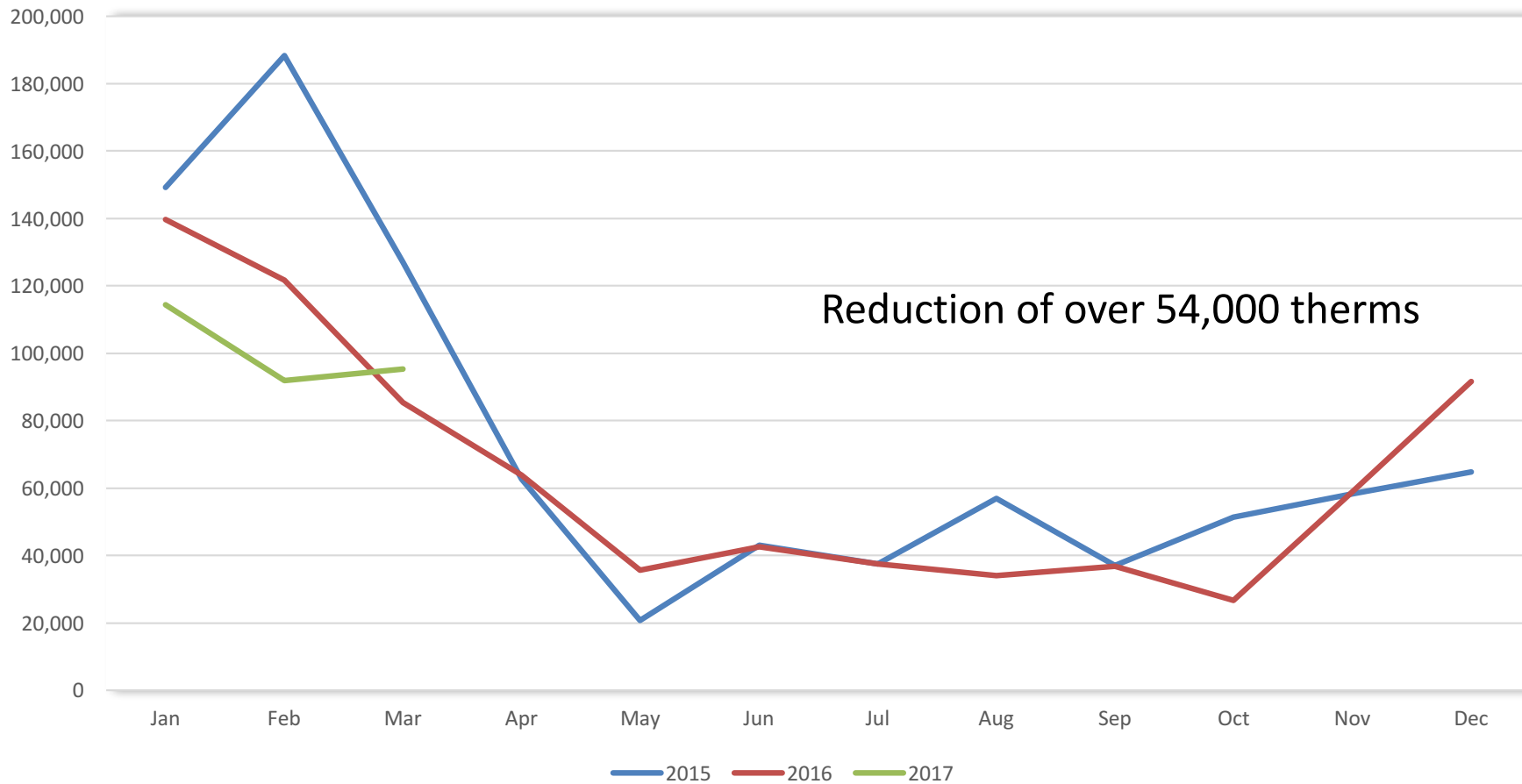
June 27, 2017



Energy Reduction

CENERGISTICS

Natural Gas

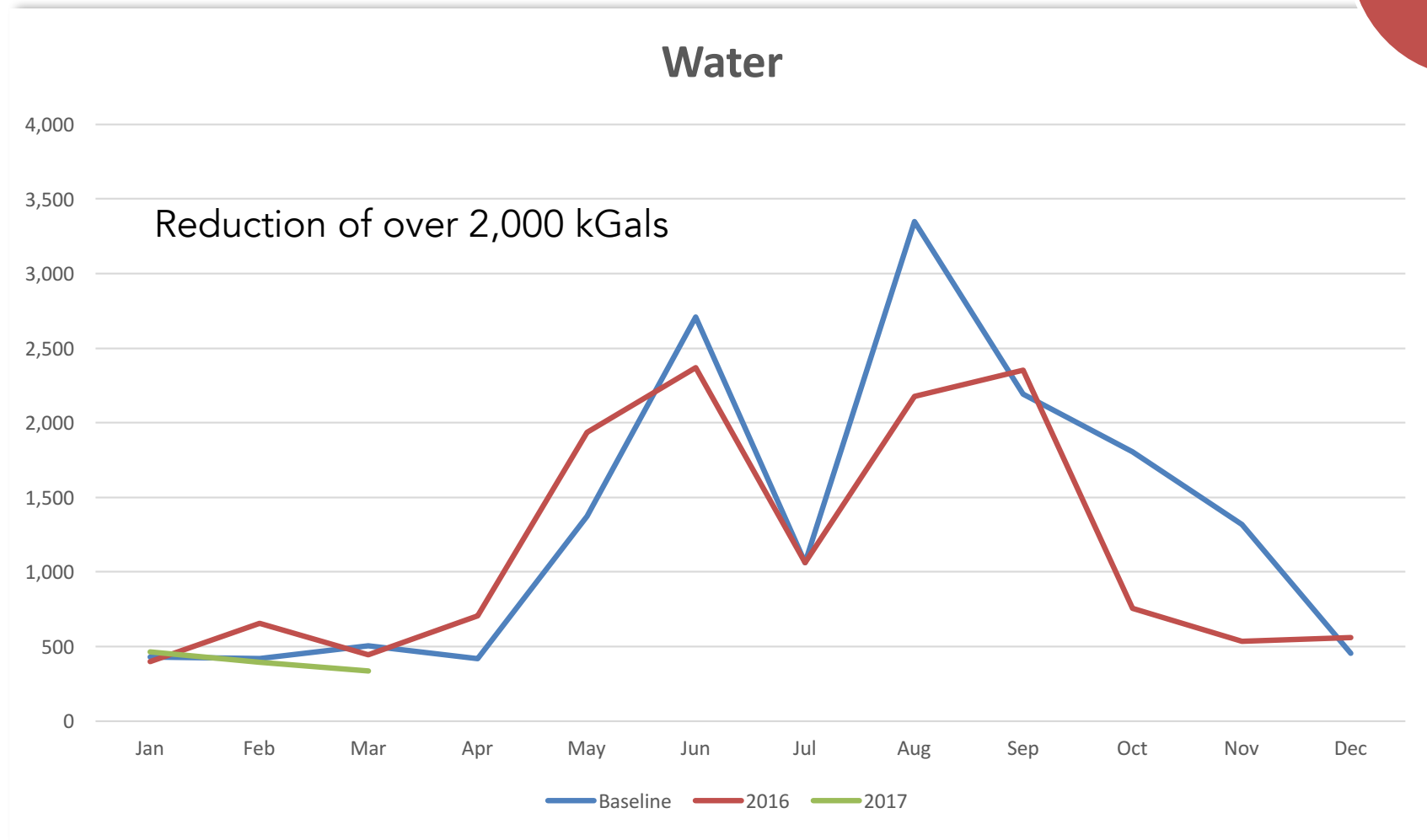


June 27, 2017



Energy Reduction

CENERGISTICS



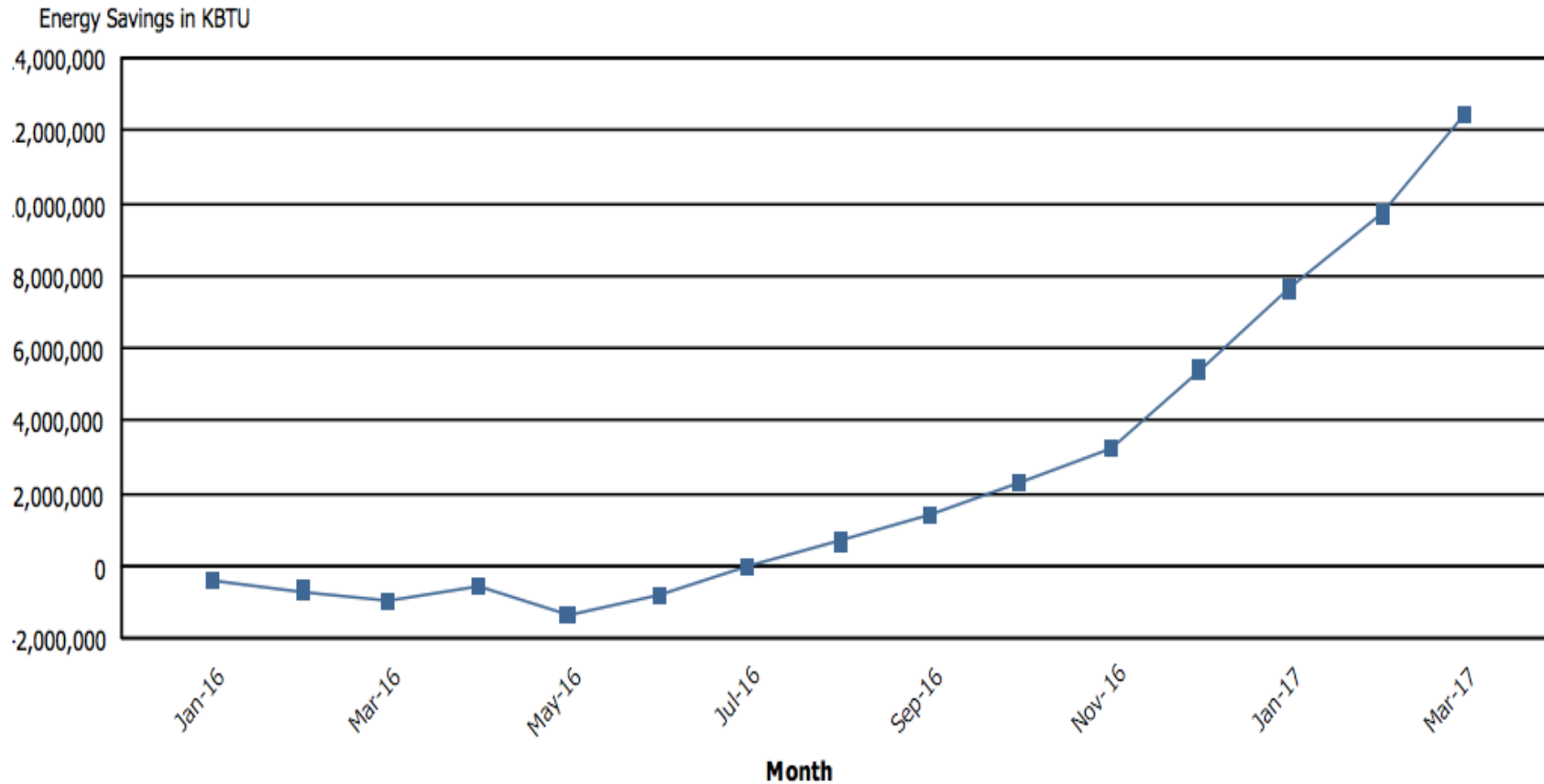
June 27, 2017



Cumulative Energy Use Savings

CENERGISTICS

Cumulative Energy Savings



June 27, 2017



Energy Savings JANUARY 2016 – MARCH 2017

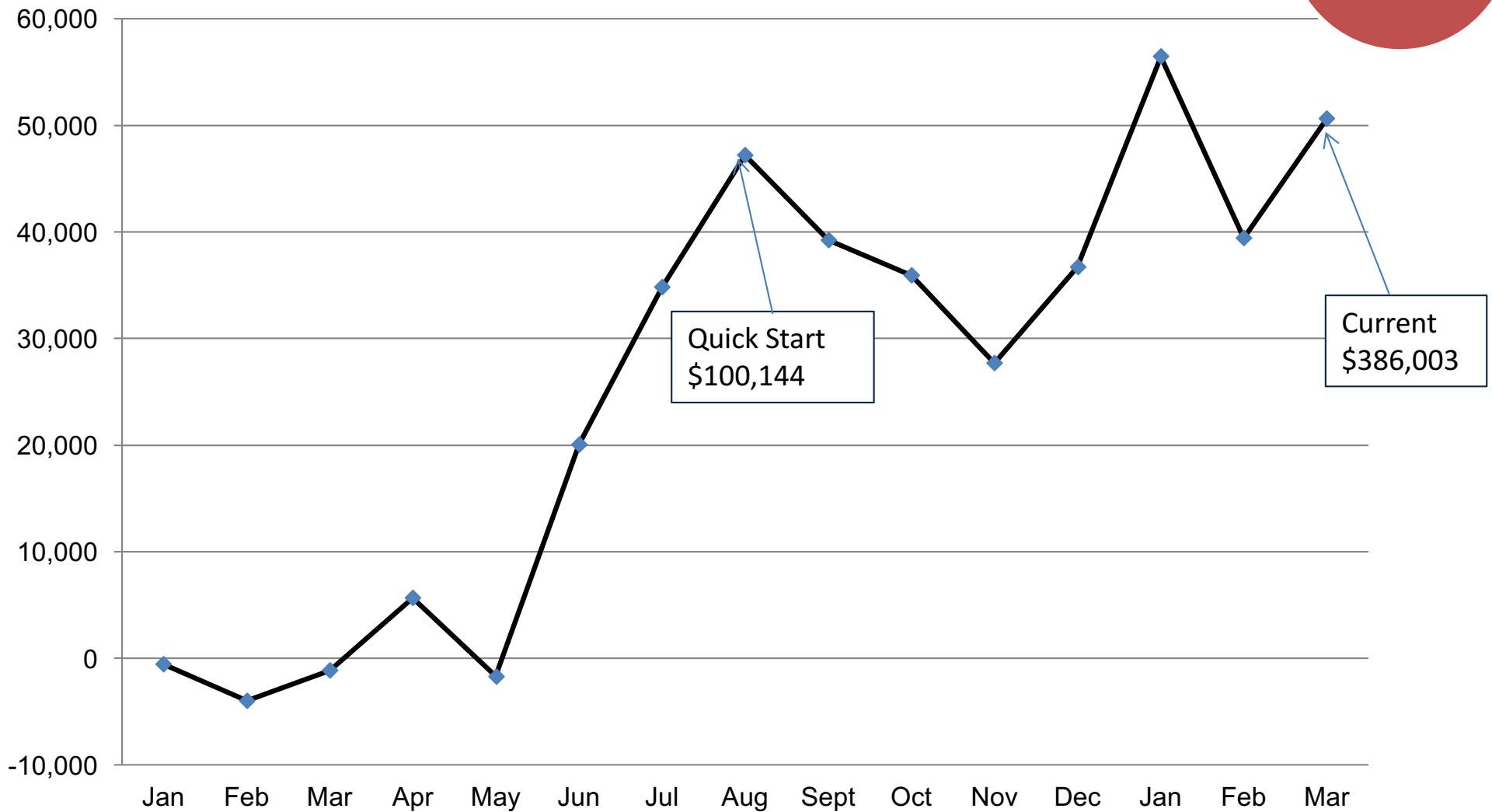
\$386,003

16.3%

Monthly Savings Trend (Cumulative)

Total Savings: \$386,003

CENERGISTICS



June 27, 2017



Savings In Period

A red circle containing the word CENERGISTICS in white capital letters.

Total Savings by (Utility Type)

▪ Electricity	\$331,845
▪ Natural Gas	\$ 49,750
▪ Water & Sewer	\$ 4,408

Total Savings by (Period)

Quick Start (January '16-August '16)	\$100,144
Performance Period (September '16 - present)	<u>\$285,859</u>

Savings (Total) (16.3%)	\$386,003
--	------------------

Environmental Benefits

CENERGISTICS

We have saved:

- Over 2,000,000 kWh of Electricity
- Over 54,000 therms of Natural Gas
- Over 2,000 kGals of Water

The environmental impact of which can be measured as one of the following:

- Preventing 831 Metric Tons of CO₂
- Removing 173 automobiles for an entire year
- Planting 21,296 tree seedlings over 10 years



Teamwork

CENERGISTICS

The success of the program depends on everyone!

Special thanks go out to

- **Board of Education**
- **Superintendent, Kevin Coster**
- **Facilities Staff**
- **Principals & Staff**
- **Teachers & Students**
- **Community**



The Future of Our Energy Program



- Meet/Exceed 24% savings expectation (\$707,000 annually)
- Maintain good stewardship of public funds
- Continue to reduce the environmental impact of WFSD
- Identify reduction opportunities with electrical, natural gas, and water consumption
- Plan and prepare for shoulder months vs extreme weather needs
- Coordinate daily classroom shut downs
- Continue developing an “energy conservation culture”



EPC – ECOSYSTEMS



Project Economic Summary

EPC –
ECOSYSTEMS

80%

Electric savings

\$1,370,214

Guaranteed
Energy savings

17.94

Simple Payback
(Years)

100%

Fuel oil savings
district-wide

57%

In district-wide
energy reduction

\$1,647,832

Guaranteed
Incentives

Economic Benefits

EPC –
ECOSYSTEMS

Investment	\$24,072,000
Guaranteed O&M Savings	- \$120,396
Guaranteed Energy Savings	\$1,370,214
Net Guaranteed Annual Savings	\$1,249,818
Guaranteed Incentives	\$1,647,832
Simple Payback (Years)	17.94
NPV 18 Years	\$15,839,717
Project Payback with State Aid (Years)	7.97

- » District leveraged the majority of savings to get more done
- » Savings are net of all maintenance expenses
- » The district will have the choice of equipment and contractors at due time



Expected Cash Flow

EPC –
ECOSYSTEMS

Year	0	1	2	3	4	5	6		
	Construction Year								
	Savings @ 50%								
Annual Energy Cost without Improvements	\$2 903 683	\$2 820 000	\$2 876 400	\$2 933 928	\$2 992 607	\$3 052 459	\$3 113 508	\$3 175 778	\$3 239 294
Annual Energy Cost with Improvements	\$2 218 576	\$1 449 786	\$1 478 782	\$1 508 357	\$1 538 525	\$1 569 295	\$1 600 681	\$1 632 695	\$1 665 348
Annual Energy Cost Savings	\$685 107	\$1 370 214	\$1 397 618	\$1 425 571	\$1 454 082	\$1 483 164	\$1 512 827	\$1 543 084	\$1 573 945
Guaranteed Incentives	\$823 916	\$823 916							
Annual O&M Savings	\$0	(\$120 396)	(\$122 804)	(\$125 260)	(\$127 765)	(\$130 321)	(\$132 927)	(\$135 585)	(\$138 297)
Payment for Financing Project - Principal	\$0	(\$1 291 197)	(\$1 336 389)	(\$1 383 162)	(\$1 431 573)	(\$1 481 678)	(\$1 533 537)	(\$1 587 210)	(\$1 642 763)
Payment for Financing Project - Interest	\$0	(\$872 008)	(\$826 816)	(\$780 043)	(\$731 632)	(\$681 527)	(\$629 668)	(\$575 994)	(\$520 442)
Payment for Ongoing Services	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cost of Ongoing Monitoring & Verification (M&V)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Net Annual Benefits without State Aid	\$1 509 023	(\$89 471)	(\$888 391)	(\$862 894)	(\$836 888)	(\$810 362)	(\$783 305)	(\$755 707)	(\$727 557)
State Financial assistance - Principal	\$0	\$1 054 229	\$1 079 267	\$1 104 900	\$1 131 141	\$1 158 006	\$1 185 508	\$1 213 664	\$1 242 489
State Financial assistance - Interest	\$0	\$444 916	\$419 878	\$394 246	\$368 004	\$341 140	\$313 637	\$285 481	\$256 657
Net Annual Benefits with State Aid	\$1 509 023	\$1 409 674	\$610 755	\$636 251	\$662 257	\$688 783	\$715 840	\$743 438	\$771 588
Cumulative Cash Flow with State Aid	\$1 509 023	\$2 918 697	\$3 529 452	\$4 165 703	\$4 827 960	\$5 516 743	\$6 232 584	\$6 976 022	\$7 747 610
Net Present Value of Cumulative Cash Flow	\$1 509 023	\$2 891 057	\$3 478 095	\$4 077 648	\$4 689 472	\$5 313 324	\$5 948 970	\$6 596 178	\$7 254 721

- » This cash flow assumes 20% Discount Rate, 3.5% Interest Rate, 2.0% Energy Inflation Rate
- » Loan repayment follows SED Aid over 15 years. 77% Aid Ratio applied
- » All Net Annual Benefits are to the benefit of the district.



Expected Cash Flow

EPC –
ECOSYSTEMS

Year	9	10	11	12	13	14	15	16	17	18	19
Annual Energy Cost without Improvements	\$3 304 079	\$3 370 161	\$3 437 564	\$3 506 316	\$3 576 442	\$3 647 971	\$3 720 930	\$3 795 349	\$3 871 256	\$3 948 681	\$63 286 404
Annual Energy Cost with Improvements	\$1 698 655	\$1 732 628	\$1 767 281	\$1 802 627	\$1 838 679	\$1 875 453	\$1 912 962	\$1 951 221	\$1 990 245	\$2 030 050	\$33 261 847
Annual Energy Cost Savings	\$1 605 424	\$1 637 533	\$1 670 283	\$1 703 689	\$1 737 763	\$1 772 518	\$1 807 968	\$1 844 128	\$1 881 010	\$1 918 630	\$30 024 557
Guaranteed Incentives											\$1 647 832
Annual O&M Savings	(\$141 063)	(\$143 884)	(\$146 762)	(\$149 697)	(\$152 691)	(\$155 745)	(\$158 860)	(\$162 037)	(\$165 278)	(\$168 583)	(\$2 577 957)
Payment for Financing Project - Principal	(\$1 700 260)	(\$1 759 769)	(\$1 821 361)	(\$1 885 108)	(\$1 951 087)	(\$2 019 375)	(\$2 090 053)	(\$0)	(\$0)	(\$0)	\$(24 914 520)
Payment for Financing Project - Interest	(\$462 945)	(\$403 436)	(\$341 844)	(\$278 097)	(\$212 118)	(\$143 830)	(\$73 152)	\$0	\$0	\$0	\$(7 533 554)
Payment for Ongoing Services	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$-
Cost of Ongoing Monitoring & Verification (M&V)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$-
Net Annual Benefits without State Aid	(\$698 844)	(\$669 557)	(\$639 684)	(\$609 213)	(\$578 134)	(\$546 432)	(\$514 097)	\$1 682 090	\$1 715 732	\$1 750 047	\$(3 353 641)
State Financial assistance - Principal	\$1 271 998	\$1 302 208	\$1 333 135	\$1 364 797	\$1 397 211	\$1 430 395	\$1 464 366				\$18 733 312
State Financial assistance - Interest	\$227 148	\$196 938	\$166 010	\$134 348	\$101 934	\$68 751	\$34 779				\$3 753 866
Net Annual Benefits with State Aid	\$800 301	\$829 588	\$859 461	\$889 932	\$921 012	\$952 713	\$985 049	\$1 682 090	\$1 715 732	\$1 750 047	\$19 133 537
Cumulative Cash Flow with State Aid	\$8 547 912	\$9 377 500	\$10 236 962	\$11 126 893	\$12 047 905	\$13 000 618	\$13 985 667	\$15 667 757	\$17 383 490	\$19 133 537	\$19 133 537
Net Present Value of Cumulative Cash Flow	\$7 924 377	\$8 604 929	\$9 296 162	\$9 997 867	\$10 709 839	\$11 431 876	\$12 163 782	\$13 389 094	\$14 614 405	\$15 839 717	\$15 839 717

Project NPV 18 Years	\$15 839 717
Project Simple Payback (Years)	17,94
Project Payback with State Aid (Years)	7,97



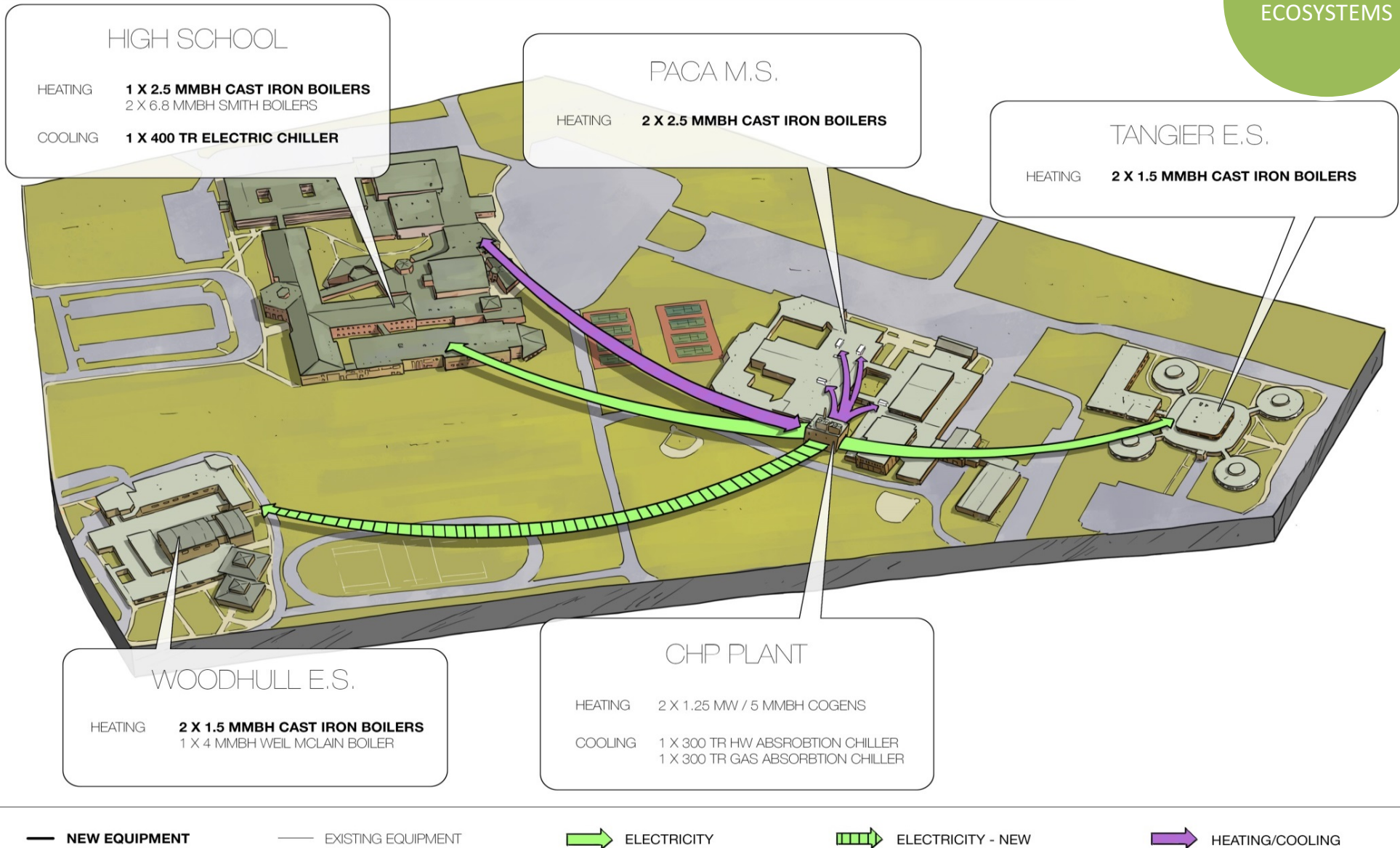
MEASURES

		WF ELEMENTARY	WOODHULL	MORICHES	TANGIER	PACA	HOBART	WF MIDDLE SCHOOL	WF HIGH SCHOOL
1	INTERIOR LIGHTING UPGRADE	●	●	●	●	●	●	●	●
2	EXTERIOR LIGHTING UPGRADE	●	●	●	●	●	●	●	●
3	PACA COMPLEX OPTIMIZATION								
	ELECTRIC EXPANSION		●						
	CHHP CONTROL OPTIMIZATION					●			
	HEAT REJECTION OPTIMIZATION					●			●
	CHILLED WATER SYSTEM UPGRADE					●			●
4	PUMP AND NETWORK OPTIMIZATION	●	●	●	●	●	●	●	●
5	BOILER REPLACEMENT	●	●	●	●	●	●	●	●
6	VENTILATION AND CONTROLS UPGRADE								
	NEW VENTILATION SYSTEMS	●			●	●	●		●
	ROOF REPLACEMENT	●							
	VENTILATION SYSTEM OVERHAULS					●			●
	NEW UNIT VENTILATORS	●		●					
	VFDs ON FAN MOTORS	●				●	●	●	●
	CONTROL OPTIMIZATION		●		●				●
7	DHW HEATER UPGRADE	●	●	●		●	●	●	
8	NEW COMBINED HEAT AND POWER UNITS	●					●	●	
9	COMPUTER ENERGY MANAGEMENT	●	●	●	●	●	●	●	●

EPC –
ECOSYSTEMS

Optimization of the Existing CHP

EPC –
ECOSYSTEMS



Key Asset Upgrades & Design Benefits

EPC –
ECOSYSTEMS

- ›› The replacement of 10 roof top units at the William Paca Middle School, along with their full integration with the new optimized central plant cooling system and removal of 4 obsolete R22 DX system.
- ›› Improve the humidity and air quality at the HS original wing through complete system rebalancing and commissioning and the replacement of key equipment.
- ›› The complete replacement of unit ventilators throughout William Floyd Elementary (add cooling) and Moriches Elementary.
- ›› The **redesign and complete replacement** of the district lighting system to take advantage of existing LED savings and fixture technologies as per the district's long-term vision.



Key Asset Upgrades & Design Benefits

EPC –
ECOSYSTEMS

- The replacement of both troublesome air handling units at William Floyd Elementary School.
- The replacement of 19 old inefficient boilers with 17 new cast iron, high-efficiency boilers to improve modulation and minimize operational and maintenance costs.
- Optimization of the existing CHP plant for maximum cost savings and reliability, and centralizing the delivery of heating and chilled water for maximum asset utilization.
- Extending the existing Building Management System to remaining pneumatic areas in High School.
- Partial roof replacement at the William Floyd Elementary School.



Capital Bond Measures (Additions)

EPC –
ECOSYSTEMS

Paca

- New semi-instantaneous water heater

WF Elementary

- Air conditioning – Replace 2 rooftop units with DX coil
- Replace 56 classroom unit ventilators with new cooling capacity units
- Partial roof replacement

Moriches Elementary School

- Replace 17 classroom unit ventilators with new cooling capacity units

Tangier Smith Elementary School

- Air conditioning capability for 8 new rooftop units with DX cooling and modulation

Hobart Elementary School

- Air conditioning capability for 2 new rooftop units with DX cooling

Environmental & Investment Benefits

A green circular logo with the text "EPC – ECOSYSTEMS" in white.

EPC –
ECOSYSTEMS

- **4,400** metric tons of GHG emissions reduced annually
- **100%** reduction in fuel oil consumption annually
- **79%** in electric load reduction annually
- **71%** of electric energy generation, with only 14% reliance on the grid

CAPITAL PROJECT

June 27, 2017

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High School

CAPITAL
PROJECT

Item No.	William Floyd HS	PRIORITY 1	PRIORITY 2	SCOPE TO BE DONE UNDER EPC	SCOPE TO BE DONE UNDER SMART
1	HVAC Systems	\$1,210,000	\$0		
2	Boiler			*	
3	Water Cooled Chillers			*	
4	HVAC EQUIPMENT			*	
5	HVAC EQUIPMENT	\$165,000			
6	Unit Ventilators	\$1,045,000			
7	Fire Safety Systems	\$1,430,000	\$0		
8	Fire Alarm Systems (H)	\$1,430,000			
9	Electrical Systems	\$214,500	\$0		
10	Circuit Breaker Panels	\$214,500	\$0		
11	Lighting			*	
12	Technology				
13	Phone system:				**
14	Additional Access Points				**
15	Security				
16	Video Surveillance System				**
17	Access Control System				**
	TOTALS BY PRIORITY:	\$2,854,500	\$0		
	BUILDING TOTAL(Not including Contingency and incidental Budget)	\$2,854,500			



PACA Middle School

CAPITAL
PROJECT

Item No.	Paca MS	PRIORITY 1	PRIORITY 2	SCOPE TO BE DONE UNDER EPC	SCOPE TO BE DONE UNDER SMART
1	HVAC Systems	\$495,000	\$0		
2	Boiler Kitchen			*	
3	Water Heater			*	
4	Water Cooled Chillers			*	
5	Air handling and ventilation equipment			*	
6	Fire Safety Systems	\$539,000	\$0		
7	Fire Alarm Systems (H)	\$539,000	\$0		
8	Electrical Systems	\$330,000	\$0		
9	Circuit Breaker Panels	\$330,000	\$0		
10	Lighting			*	
11	Technology				
12	Phone system:				**
13	Additional Access Points				**
14	Security				
15	Video Surveillance System				**
16	Access Control System				**
	TOTALS BY PRIORITY:	\$1,364,000	\$0		
	BUILDING TOTAL(Not including Contingency and incidental Budget)	\$1,364,000			

June 27, 2017

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William Floyd Middle School

CAPITAL
PROJECT

Item No.	Wm. Floyd MS	PRIORITY 1	PRIORITY 2	SCOPE TO BE DONE UNDER EPC	SCOPE TO BE DONE UNDER SMART
1	HVAC Systems	\$396,000	\$0		
2	Boilers			*	
3	Air handling and ventilation equipment	\$242,000	\$0		
4	Ventilation	\$99,000	\$0		
5	HVAC Equipment	\$55,000	\$0		
6	Fire Safety Systems	\$412,500	\$0		
7	Fire Alarm Systems (H)	\$412,500	\$0		
8	Electrical Systems				
9	Lighting			*	
10	Technology				
11	Telephone System				**
12	Additional Access Points				**
13	Security				
14	Video Surveillance System				**
15	Access Control System				**
	TOTALS BY PRIORITY:	\$808,500	\$0		
	BUILDING TOTAL(Not including Contingency and incidental Budget)	\$808,500			



Hobart Elementary School

CAPITAL
PROJECT

Item No.	Hobart ES	PRIORITY 1	PRIORITY 2	SCOPE TO BE DONE UNDER EPC	SCOPE TO BE DONE UNDER SMART
1	Building Envelope	\$80,000	\$0		
2	1992 Addition	\$80,000	\$0		
3	Plumbing (Excluding HVAC Systems)	\$16,500	\$0		
4	Oil Fired Water Heater	\$16,500	\$0		
5	HVAC Systems	\$110,000	\$2,156,250		
6	Air Conditioning	\$0	\$2,156,250		
7	Boilers			*	
8	Rooftop Equipment			*	
9	Rooftop Fans/Hoods	\$110,000	\$0		
10	Fire Safety Systems	\$341,000	\$0		
11	Fire Alarm Systems (H)	\$341,000	\$0		
12	Electrical Systems	\$0	\$0		
13	Lighting fixtures			*	
14	Technology				
15	Phone system				* *
16	Additional Access Points				* *
17	Security				
18	Video Surveillance System				* *
19	Access Control System				* *
	TOTALS BY PRIORITY:	\$547,500	\$2,156,250		
	BUILDING TOTAL(Not including Contingency and incidental Budget)	\$2,703,750			



Moriches Elementary School

CAPITAL
PROJECT

Item No.	Moriches ES	PRIORITY 1	PRIORITY 2	SCOPE TO BE DONE UNDER EPC	SCOPE TO BE DONE UNDER SMART
1	Building Envelope	\$2,278,000	\$0		
2	Original Building Roof	\$2,135,000	\$0		
3	1992 Addition Roof	\$143,000	\$0		
4	HVAC Systems	\$0	\$0		
5	Unit Ventilators			*	
6	Boiler			*	
7	Fire Safety Systems	\$247,500	\$0		
8	Fire Alarm Systems (H)	\$247,500	\$0		
9	Electrical Systems	\$203,500	\$0		
10	Circuit Breaker Panels	\$203,500	\$0		
11	Lighting fixtures			*	
12	Technology				
13	Phone system				**
14	Additional Access Point				**
15	Security				
16	Video Surveillance System				**
17	Access Control System				**
	TOTALS BY PRIORITY:	\$2,729,000	\$0		
	BUILDING TOTAL(Not including Contingency and incidental Budget)	\$2,729,000			

Tangier Smith Elementary School

CAPITAL
PROJECT

Item No.	Tangier ES	PRIORITY 1	PRIORITY 2	SCOPE TO BE DONE UNDER EPC	SCOPE TO BE DONE UNDER SMART
1	Building Envelope	\$210,000	\$0		
2	Option B - Reseam Original & Addition	\$210,000	\$0		
3	HVAC Systems	\$0	\$0		
4	Rooftop Units			*	
5	Boiler			*	
6	Fire Safety Systems	\$247,500	\$0		
7	Fire Alarm Systems (H)	\$247,500	\$0		
8	Electrical Systems	\$203,500	\$0		
9	Circuit Breaker Panels	\$203,500	\$0		
10	Lighting fixtures			*	
11	Technology				
12	Phone system:				**
13	Additional Access Points				**
14	Security				
15	Video Surveillance System				**
16	Access Control System				**
	TOTALS BY PRIORITY:	\$661,000	\$0		
	BUILDING TOTAL(Not including Contingency and incidental Budget)	\$661,000			

William Floyd Elementary School

CAPITAL
PROJECT

Item No.	Wm. Floyd ES	PRIORITY 1	PRIORITY 2	SCOPE TO BE DONE UNDER EPC	SCOPE TO BE DONE UNDER SMART
1	Building Envelope	\$1,311,000	\$0		
2	Windows:	\$671,000	\$0		
3	Roofs 1992 Addition	\$640,000	\$0		
4	Plumbing (Excluding HVAC Systems)	\$385,000	\$0		
5	Domestic Water Piping	\$385,000	\$0		
6	HVAC Systems	\$0	\$2,903,750		
7	Boilers			*	
8	Unit Ventilators			*	
9	Air Conditioning	\$0	\$2,903,750		
10	Central Air Handlers			*	
11	Fire Safety Systems	\$346,500	\$0		
12	Fire Alarm Systems (H)	\$346,500	\$0		
13	Electrical Systems	\$220,000	\$0		
14	Circuit Breaker Panels	\$220,000	\$0		
15	Lighting fixtures			*	
16	Technology	\$71,500	\$0		
17	Telephone System				**
18	Additional Access Points				**
19	Clock system:	\$71,500	\$0		
20	Security	\$0	\$0		
21	Video Surveillance System				**
22	Access Control System				**
	TOTALS BY PRIORITY:	\$2,334,000	\$2,903,750		
	BUILDING TOTAL(Not including Contingency and incidental Budget)	\$5,237,750			



District wide Upgrades

CAPITAL
PROJECT

Adaptive Playground- One	\$400,000
Reconstruction of Main Sports Area Syn	\$3,915,000
New Pre-Fabricated Press Box 30' x 10'	\$265,000
Provide Syn Turf Practice Flds - 200 x 380	\$1,315,000
Provide 2nd Syn Turf Practice Flds - 200 x	\$1,315,000
Turf/Track Lighting upgrades Main Sports	\$450,000
Reconstruction of Original Track / Natural	\$1,830,000
New Scoreboard for Original Fld	\$80,000
Upgrades to High School/Paca MS/WFMS	\$2,625,000
Sub-Total	\$12,195,000

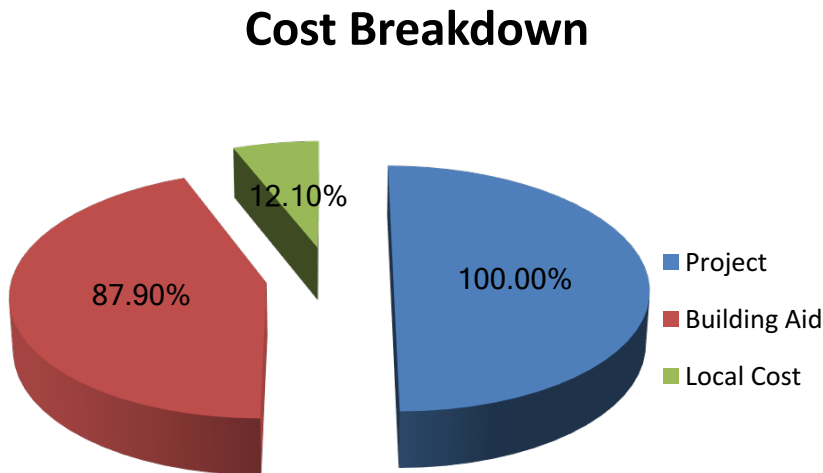
June 27, 2017



Total Projected Capital Cost

Wm Floyd SD - Capital Improvement Summary			
District-wide Totals by Building - Executive Summary	Priority 1 - Capital reconstruction work required - TPC	Priority 2 - AC improvements - TPC	Totals
			\$44,805,000
William Floyd HS	\$3,770,000		\$3,770,000
Paca MS	\$1,800,000		\$1,800,000
Wm. Floyd MS	\$1,070,000		\$1,070,000
Wm. Floyd ES	\$3,080,000	\$3,835,000	\$6,915,000
Woodhull ES	\$2,575,000	\$2,125,000	\$4,700,000
Hobart ES	\$725,000	\$2,845,000	\$3,570,000
Moriches ES	\$3,605,000	\$0	\$3,605,000
Tangier ES	\$875,000	\$0	\$875,000
Sub-Total	\$17,500,000	\$8,805,000	\$26,305,000
District Wide			
Adaptive Playground- One		\$400,000	\$400,000
Reconstruction of Main Sports Area Syn		\$3,915,000	\$3,915,000
New Pre-Fabricated Press Box 30' x 10'		\$265,000	\$265,000
Provide Syn Turf Practice Flds - 200 x 380		\$1,315,000	\$1,315,000
Provide 2nd Syn Turf Practice Flds - 200 x		\$1,315,000	\$1,315,000
Turf/Track Lighting upgrades Main Sports		\$450,000	\$450,000
Reconstruction of Original Track / Natural		\$1,830,000	\$1,830,000
New Scoreboard for Original Fld		\$80,000	\$80,000
Upgrades to High School/Paca MS/WMMS		\$2,625,000	\$2,625,000
Sub-Total		\$12,195,000	\$12,195,000
Total Project Cost (TPC includes Contingency)	\$17,500,000	\$21,000,000	\$38,500,000

District Building Aid Ratio



For all approved Capital Projects the district only pays \$.1210 of each dollar spent



June 27, 2017

