



Guaranteed Energy Savings

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- + Pre-Scoping Audit
 - September
- + Investment Grade Audit
 - October West Perry Tour
 - November
- + GESA Contract Approval
 - January/February
- + Construction
 - March/April
 - Potential areas for Early Start
- + Major Construction
 - June



Recommendations

1

STEP 1 SCOPING LEVEL AUDIT

- Identify Goals
- Data Collection & Survey
- Detailed Energy Analysis
- Present Project Cost & Savings Budget

2

STEP 2 INVESTMENT GRADE AUDIT

- Generate Final Report
- Present to Administration
- Review & Approval
- Execute Contract

3

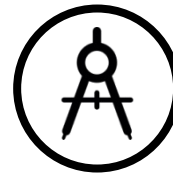
STEP 3 FINAL DESIGN

- Final Engineering
- Permit Submission
- Owner Final Design Review
- Procure Major Equipment

4

STEP 4 CONSTRUCTION

- Installation Coordination
- Commissioning
- Owner Training
- Measurement and Verification





+ Working with Committee to adjust scope

- Establishing what can be “self performed” by the District
- Establishing facility renewal programs that will be implemented by the District
 - Painting
 - Carpet

+ Biglerville Elementary School HVAC

- Modification to the direct replacement scope to create similar capabilities between the systems
- Ensure maintenance staff can maintain the equipment safely
- Harden the system against failures that will impact the learning environment



Bendersville Elementary School

+ LED Upgrades

- Interior & Exterior Fixture Retrofits

+ Building Envelope Upgrades

- Seal Exterior of the Building

+ Mechanical Insulation

- Insulate Exposed Mechanical Heat Sources

+ MEP Upgrades

- Library and Office are not included, currently have cooling
- New Central Hot Water Plant
- New RTU for Multipurpose Room
- VUV Units in all Classrooms
- Control Upgrade

+ Windows & Door Upgrades

- Remove and Replace Existing Windows
- New Storefront Entrance
- Replace Wood Exterior Doors





Bendersville Elementary School

+ Bathroom Renovations

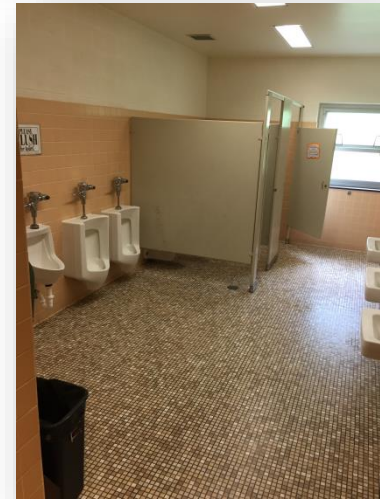
- Renovate Bathrooms
- New Fixtures
- New Dividers

+ Music Room Carpet Replacement

- New Carpet

+ Generator Replacement

- Direct Replacement of the Generator





Bendersville Elementary School Costs

Upper Adams School District Energy Conservation Measures				
Description	ECM Cost	ECM 20 Year Savings	Development Status	Program 1
<i>Bendersville Elementary School</i>				
Bendersville Elementary LED Upgrades	\$42.5K-\$47.0K	\$105K-\$117K	Budget	
Bendersville Elementary Building Envelope Upgrades	\$6.6K-\$7.28K	\$37.6K-\$41.6K	Budget	
Bendersville Elementary Mechanical Insulation	\$9.5K-\$10.5K	\$21.2K-\$23.4K	Budget	
Bendersville Elementary MEP Upgrades	\$1.52M-\$1.68M	\$48.8K-\$54.0K	Budget	
Bednersville Elementary Windows & Doors Upgrades	\$193.6K-\$214.0K	\$7.87K-\$8.70K	Budget	
Bendersville Elementary Bathroom Renovations	\$223.1K-\$246.5K	\$4.5K-\$5.0K	Budget	
Bendersville Elementary Music Room Carpet Replacement	\$3.99K-\$4.41K	\$ -	Budget	
Bendersville Elementary Generator Replacement	\$84.62K-\$93.53K	\$ -	Budget	
Bendersville Elementary School				Program 1
Total Hard Costs				\$1.77M-\$1.96M
Engineering Costs (Mechanical, Electrical, Energy, Structural, Etc.)				\$88.61K-\$97.94K
Construction Management				\$26.58K-\$29.38K
Permits & Bonds				\$28.36K-\$31.34
Commissioning				\$15.95K-\$17.63K
Measurement & Verification				\$12.41K-\$13.71K
Total Soft Costs				\$171.90K-\$190.00K
Total Project Costs (TPC):				\$1.94-\$2.15M
20 Year Energy and Operational Savings (S):				\$220K-\$245K
Actual Project Cost (TPC-S):				\$1.72M-1.91M



Arendtsville Elementary School

+ LED Upgrades

- Interior & Exterior Fixture Retrofits

+ Building Envelope Upgrades

- Seal Exterior of the Building

+ Mechanical Insulation

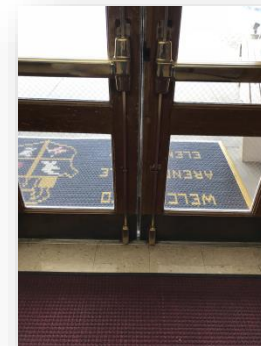
- Insulate Exposed Mechanical Heat Sources

+ MEP Upgrades

- Cafeteria, Library and Office are not included, currently have cooling
- New Central Hot Water Plant
- New RTU for Multipurpose Room
- VUV Units in all Classrooms
- Control Upgrade

+ Windows & Door Upgrades

- Remove and Replace Existing Windows
- New Storefront Entrance
- Replace Wood Exterior Doors





Arendtsville Elementary School

+ Bathroom Renovations

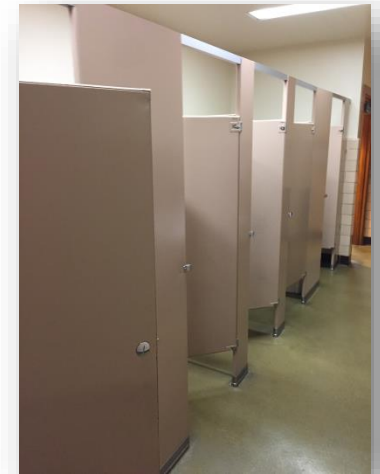
- Renovate Bathrooms
- New Fixtures
- New Dividers

+ Library Room Carpet Replacement

- New Carpet

+ Generator Replacement

- Direct Replacement of the Generator





Arendtsville Elementary School Costs

Upper Adams School District Energy Conservation Measures				
Description	ECM Cost	ECM 20 Year Savings	Development Status	Program 1
Arendtsville Elementary School				
Arendtsville Elementary LED Upgrades	\$34.79K-\$38.45K	\$94.97K-\$104.97K	Budget	
Arendtsville Elementary Building Envelope Upgrades	\$12.14K-\$13.42	\$20.86K-\$23.06K	Budget	
Arendtsville Elementary Mechanical insulation	\$7.63K-\$8.43	\$18.11K-\$20.02K	Budget	
Arendtsville Elementary MEP Upgrades	\$1,45M-\$1.60M	\$50.47K-\$55.78K	Budget	
Arendtsville Elementary Windows & Doors Upgrades	335.70K-371.04K	\$25.45K-\$28.12K	Budget	
Arendtsville Elementary Bathroom Renovations	\$223.1K-\$246.55K	\$4.57K-\$5.05K	Budget	
Arendtsville Elementary Library Carpet Replacement	\$11.28K-\$12.47K	\$ -	Budget	
Arendtsville Elementary Generator Replacement	\$84.63K-\$93.53K	\$ -	Budget	
Arendtsville Elementary School				Program 1
Total Hard Costs				\$1.84M-\$2.03M
Engineering Costs (Mechanical, Electrical, Energy, Structural, Etc.)				\$92.01K-\$101.57K
Construction Management				\$27.60K-30.47K
Permits & Bonds				\$29.44K-\$32.50K
Commissioning				\$16.56K-\$18.28K
Measurement & Verification				\$12.88K-\$14.22K
Total Soft Costs				\$178.51K-\$197.04K
Total Project Costs (TPC):				\$2.02M-\$2.23M
20 Year Energy and Operational Savings (S):				\$209K-\$232K
Actual Project Cost (TPC-S):				\$1.81M-\$2.00M



Biglerville Elementary School

+ LED Upgrades

- Interior & Exterior Fixture Retrofits

+ Building Envelope Upgrades

- Seal Exterior of the Building

+ Mechanical Insulation

- Insulate Exposed Mechanical Heat Sources

+ Transformer Upgrades

- Replace Transformers with Energy Efficient Transformers

+ Windows Upgrades

- Replace Wood Core Windows

+ Gutter System Replacement

- Replace Gutter System





Biglerville Elementary School

+ Bathroom Renovations

- Renovate Bathrooms
- New Fixtures
- New Dividers

+ Gym/Cafeteria Divider Replacement

- Existing divider is not operational

+ Generator Replacement

- Direct Replacement of the Generator





Biglerville Elementary School

+ HVAC Upgrades

- Provided 2 Options
- Both include Control Upgrade

+ Option 1 – Direct Replacement

- Air Handler Replacements in Kind

+ Option 2 – VUV Upgrade

- Abandon Air Handling Units and VAVs and install VUV Units in Classrooms





Biglerville Elementary School

	Direct Replacement	VUV Upgrade
Safe Maintenance		X
Serviceability		X
Active Dehumidification		X
Minimal Impact to Space		X
Room-By-Room Operation		X

+ HVAC Comparison

- Provide additional cost to create similar capabilities for the systems
 - System of catwalks in the ceiling
 - Control upgrades required to do active dehumidification
 - Unit upgrades to minimize failure impacts
- Nothing can be done for the Room-By-Room Operation

+ System Enhancement Cost: \$1.0M-\$1.25M

- Energy Impact: \$20k-\$30K per year (Boilers)





Biglerville Elementary School Costs

Upper Adams School District Energy Conservation Measures					
Description	ECM Cost	ECM 20 Year Savings	Development Status	Program 1	Program 2
Biglerville Elementary School					
Biglerville Elementary LED Upgrades	\$94.47K-\$104.41K	\$216.79K-\$239.61K	Budget		
Biglerville Elementary Buidling Envelope Upgrades	\$12.58K-\$13.90K	\$48.55K-\$53.66K	Budget		
Biglerville Elementary Mechanical Insulation	\$8.25K-\$9.12K	\$16.62K-\$18.27K	Budget		
Biglerville Elementary Transformer Upgrade	\$52.08K-\$57.56K	\$106.04K-\$117.20K	Budget		
Biglerville Elementary MEP Upgrades (Direct Replacement)	\$678.23K-\$749.62K	\$75.44K-\$83.38K	Budget		
Biglerville Elementary MEP Upgrades (VUV Upgrade)	\$2.97M-\$3.29M	\$94.45K-\$104.39K	Budget		
Biglerville Elementary Windows Upgrades	\$225.91K-\$249.69K	\$7.87K-\$8.70K	Budget		
Biglerville Elementary Bathroom Renvoations	\$111.53K-\$123.27K	\$1.63K-\$1.80K	Budget		
Biglerville Elementary Gutter System Replacement	\$125.71K-\$138.94K	\$ -	Budget		
Biglerville Elementary Gym/Cafeteria Divider Replacement	\$30.69K-\$33.92K	\$ -	Budget		
Biglerville Elementary School				Program 1	Program 2
Total Hard Costs				\$1.20M-\$1.32M	\$3.49M-\$3.87M
Engineering Costs (Mechanical, Electrical, Energy, Structural, Etc.)				\$59.86K-\$66.16K	\$174.45K-\$193.18K
Construction Management				\$17.96K-\$19.85K	\$52.34K-\$57.95K
Permits & Bonds				\$19.16K-\$21.17K	\$55.82K-\$61.82K
Commissioning				\$10.78K-\$11.91K	\$31.40K-\$34.77K
Measurement & Verification				\$8.38K-\$9.26K	\$24.42K-\$27.05K
Total Soft Costs				\$116.13K-\$128.35K	\$338.43K-\$374.77K
Total Project Costs (TPC):				\$1.31M-\$1.45M	\$3.83M-\$4.24M
20 Year Energy and Operational Savings (S):				\$471.31K-\$521.00K	\$490.32K-\$541.94K
Actual Project Costs (TPC-C)				\$842.05K-\$930.56K	\$3.34M-\$3.70M



+ LED Upgrades

- Interior & Exterior Fixture Retrofits

+ Building Envelope Upgrades

- Seal Exterior of the Building

+ Mechanical Insulation

- Insulate Exposed Mechanical Heat Sources

+ Transformer Upgrades

- Replace Transformers with Energy Efficient Transformers

+ MEP Upgrades

- Replace 14 Roof Top Units
- Replace Gym Heating Only Units with Cooling RTUs
- New Cooling Units for the Wrestling Room and Cardio Room
- Control Upgrade
- Federal Pacific Electrical System Upgrade





Middle/High School

+ Locker Room Renovations

- Renovate Existing Space

+ Team Room Renovations

- Renovate Existing Space

+ Admin Board Room Carpet Renovations

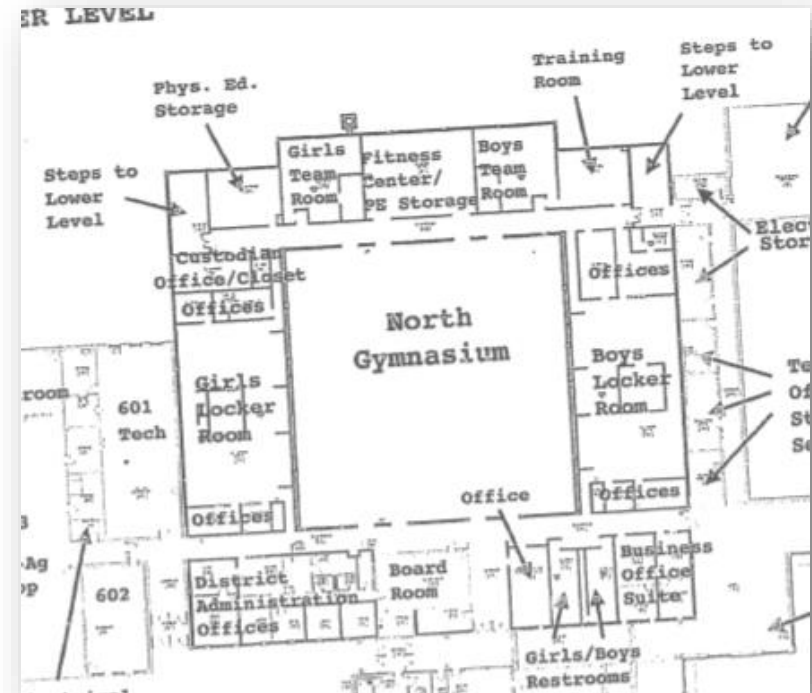
- Replace Carpet

+ Generator Upgrade for IT & Walk-In Coolers

- Upgrade Generator to add capacity

+ Administration Area Fit-out

- Repurpose space for classrooms





MS/HS Costs

Upper Adams School District Energy Conservation Measures					
Description	ECM	ECM	Development	Program	Program
	Cost	20 Year Savings	Status	1	2
Middle/High School					
MS/HS LED Upgrades	\$272.19K-\$300.84K	\$724.76K-\$801.05K	Budget		
MS/HS Building Envelope Upgrades	\$16.77K-\$18.53K	\$63.97K-\$70.71K	Budget		
MS/HW Mechanical Insulation	\$11.15K-\$12.33K	\$26.04K-\$28.79K	Budget		
MS/HS Transformer Upgrade	\$46.77K-\$51,70K	\$84.79K-\$93.72K	Budget		
MS/HS MEP Upgrades	\$2.38M-\$2.64M	\$ -	Budget		
MS/HS Locker Room Renovations	\$858.54K-\$948.91K	\$ -	Budget		
MS/HS Team Room Renovations	\$290.98K-\$321.60K	\$ -	Budget		
MS/HS Admin Board Room Carpet Replacement	\$3.76K-\$4.16K	\$ -	Budget		
MS/HS Generator Upgrade for IT & Walk-In Coolers	\$127.43K-\$140.85K	\$ -	Budget		
Middle/High School				Program 1	Program 2
Total Hard Costs				\$4.01M-\$4.43M	\$2.86M-\$3.16M
Engineering Costs (Mechanical, Electrical, Energy, Structural, Etc.)				\$200.59K-\$221.70K	\$142.92K-\$157.97K
Construction Management				\$60.18K-\$66.51K	\$42.88K-\$47.39K
Permits & Bonds				\$64.19K-\$70.94K	\$45.74K-\$50.55K
Commissioning				\$36.11K-\$39.91K	\$25.73K-\$28.43K
Measurement & Verification				\$28.08K-\$31.04K	\$20.01K-\$22.12K
Total Soft Costs				\$389.14K-\$430.10K	\$277.27K-\$306.46K
Total Project Costs (TPC):				\$4.40M-\$4.86M	\$3.14M-\$3.47M
20 Year Energy and Operational Savings (S):				\$900K-\$994K	\$900K-\$994K
Actual Project Costs (TPC-S):				\$3.50M-\$3.87M	\$2.24M-\$2.47M



Total Project Costs/Options

Description	ECM	ECM	Development	Program	Program	Program	
	Cost	20 Year Savings					Status
Bendersville Elementary School							
Bendersville Elementary LED Upgrades	\$42.5K-\$47.0K	\$105K-\$117K	Budget				
Bendersville Elementary Building Envelope Upgrades	\$6.6K-\$7.28K	\$37.6K-\$41.6K	Budget				
Bendersville Elementary Mechanical Insulation	\$9.5K-\$10.5K	\$21.2K-\$23.4K	Budget				
Bendersville Elementary MEP Upgrades	\$1.52M-\$1.68M	\$48.8K-\$54.0K	Budget				
Bendersville Elementary Windows & Doors Upgrades	\$193.6K-\$214.0K	\$7.87K-\$8.70K	Budget				
Bendersville Elementary Bathroom Renovations	\$223.1K-\$246.5K	\$4.5K-\$5.0K	Budget				
Bendersville Elementary Music Room Carpet Replacement	\$3.99K-\$4.41K	\$	-				
Bendersville Elementary Generator Replacement	\$84.62K-\$93.53K	\$	-				
Arendtsville Elementary School							
Arendtsville Elementary LED Upgrades	\$34.79K-\$38.45K	\$94.97K-\$104.97K	Budget				
Arendtsville Elementary Building Envelope Upgrades	\$12.14K-\$13.42	\$20.86K-\$23.06K	Budget				
Arendtsville Elementary Mechanical Insulation	\$7.63K-\$8.43	\$18.11K-\$20.02K	Budget				
Arendtsville Elementary MEP Upgrades	\$1.45M-\$1.60M	\$50.47K-\$55.78K	Budget				
Arendtsville Elementary Windows & Doors Upgrades	\$35.70K-\$37.04K	\$25.45K-\$28.12K	Budget				
Arendtsville Elementary Bathroom Renovations	\$223.1K-\$246.55K	\$4.57K-\$5.05K	Budget				
Arendtsville Elementary Library Carpet Replacement	\$11.28K-\$12.47K	\$	-				
Arendtsville Elementary Generator Replacement	\$84.63K-\$93.53K	\$	-				
Biglerville Elementary School							
Biglerville Elementary LED Upgrades	\$94.47K-\$104.41K	\$216.79K-\$239.61K	Budget				
Biglerville Elementary Building Envelope Upgrades	\$12.58K-\$13.90K	\$48.55K-\$53.66K	Budget				
Biglerville Elementary Mechanical Insulation	\$8.25K-\$9.12K	\$16.62K-\$18.27K	Budget				
Biglerville Elementary Transformer Upgrade	\$52.08K-\$57.56K	\$106.04K-\$117.20K	Budget				
Biglerville Elementary MEP Upgrades (Direct Replacement)	\$678.23K-\$749.62K	\$75.44K-\$83.38K	Budget				
Biglerville Elementary MEP Upgrades (VUV Upgrade)	\$2.97M-\$3.29M	\$94.45K-\$104.39K	Budget				
Biglerville Elementary Windows Upgrades	\$225.91K-\$249.69K	\$7.87K-\$8.70K	Budget				
Biglerville Elementary Bathroom Renovations	\$111.53K-\$123.27K	\$1.63K-\$1.80K	Budget				
Biglerville Elementary Gutter System Replacement	\$125.71K-\$138.94K	\$	-				
Biglerville Elementary Gym/Cafeteria Divider Replacement	\$30.69K-\$33.92K	\$	-				
Middle/High School							
MS/HS LED Upgrades	\$272.19K-\$300.84K	\$724.76K-\$801.05K	Budget				
MS/HS Building Envelope Upgrades	\$16.77K-\$18.53K	\$63.97K-\$70.71K	Budget				
MS/HS Mechanical Insulation	\$11.15K-\$12.33K	\$26.04K-\$28.79K	Budget				
MS/HS Transformer Upgrade	\$46.77K-\$51.70K	\$84.79K-\$93.72K	Budget				
MS/HS MEP Upgrades	\$2.38M-\$2.64M	\$	-				
MS/HS Locker Room Renovations	\$858.54K-\$948.91K	\$	-				
MS/HS Team Room Renovations	\$290.98K-\$321.60K	\$	-				
MS/HS Admin Board Room Carpet Replacement	\$3.76K-\$4.16K	\$	-				
MS/HS Generator Upgrade for IT & Walk-in Coolers	\$127.43K-\$140.85K	\$	-				
Hybrid Project							
MS/HS District Administration Area Fit out	\$866.00K-\$957.16K	\$	-				
Arendtsville Elementary Addition	\$7.34M-\$8.11M	\$	-				
Arendtsville Elementary Addition w/DAO	\$8.29M-\$9.16M	\$	-				
Bendersville Elementary Repurposed at DAO	\$952.60K-\$1.05M	\$	-				
				Program 1	Program 2	Program 3	
				Total Hard Costs	\$18.38M-\$20.32M	\$15.13M-\$16.73M	\$17.42M-\$19.27M
				Engineering Costs (Mechanical, Electrical, Energy, Structural, Etc.)	\$918.98K-\$1.02M	\$756.62K-\$836.48K	\$871.21K-\$963.50K
				Construction Management	\$275.69K-\$304.73K	\$226.99K-\$250.94K	\$261.36K-\$289.05K
				Permits & Bonds	\$294.07K-\$325.05K	\$242.12K-\$267.67K	\$278.79K-\$308.32K
				Commissioning	\$165.42K-\$182.84K	\$136.19K-\$150.57K	\$156.82K-\$173.43K
				Measurement & Verification	\$128.66K-\$142.21K	\$105.93K-\$117.11K	\$121.97K-\$134.89K
				Total Soft Costs	\$1.78M-\$1.97M	\$1.47M-\$1.62M	\$1.39M-\$1.87M
				Total Project Costs: (TPC)	\$20.16M-\$22.29M	\$16.60M-\$18.35M	\$19.11M-\$21.14M
				20 Year Energy and Operational Savings: (\$)	\$1.80M-\$1.98M	\$1.58M-\$1.75M	\$1.60M-\$1.77M
				Actual Project Cost: (TPC-S)	\$18.36M-\$20.30M	\$15.02M-\$16.61M	\$17.52M-\$19.37M

+ **Program #1:** Addition on Arendtsville and make Bendersville the new DAO

- Square foot budgeting
- Includes existing DAO budgeting

+ **Program #2:** Addition on Arendtsville which includes a DAO

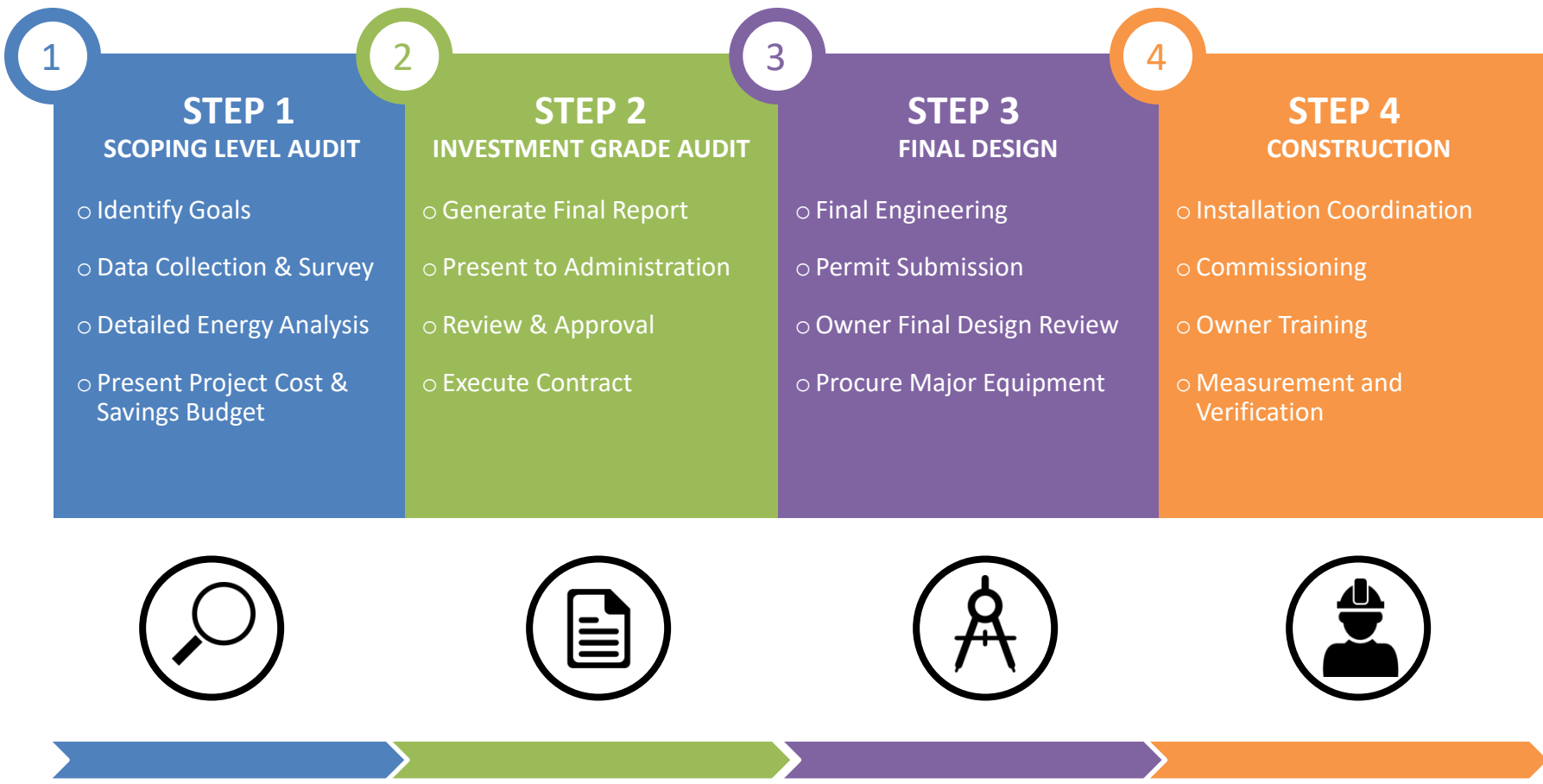
- Square foot budgeting
- Includes existing DAO
- Like for like HVAC replacement at Biglerville E.S.

+ **Program #3:** Addition on Arendtsville which includes a DAO

- Square foot budgeting
- Includes existing DAO
- VUV HVAC upgrade at Biglerville E.S.



Recommendations





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