



Tuesday, March 6, 2018

Mrs. Belinda Wallen
Business Administrator
Upper Adams School District
161 North Main Street
Biglerville, PA 17303

Please accept this proposal package for Energy Conservation and Savings Measures through a Guaranteed Energy Savings for the Upper Adams School District. We have read the Request for Proposal and accept the terms contained therein.

We are hopeful this proposal provides you with the data set all project stakeholders to make sustainable building program decisions. We strongly feel that a partnership between the Upper Adams School District and Reynolds will help you make the best building program decisions to get the best possible value out of your dollars spent. Please consider the following points when reviewing our proposal:

- **REYNOLDS PRELIMINARY ENHANCED DISTRICT OPTIONS STUDY (EDOS)** – We pledge to stand by you to ensure that you make long term building program decisions that fully consider the useful life of building systems in your existing facilities and help you to further evaluate the financial impacts of possible consolidation options at the elementary facilities. The information provided includes revised estimates from the feasibility study, maintenance/renovation needs at each facility that are pending, major building systems lifecycles, additional project considerations, and cost data that considers the facilities needs/decisions that need to be made across the District. Due to time constraints we delivered the most immediate data sets, but if selected we will continue to develop the EDOS to include the following:
 1. The costs associated with ‘doing nothing’
 2. Calculate financial and local tax impacts
 3. Evaluate the project for grant and non-traditional funding opportunities
- **THE SCOPE OF WORK YOU NEED** – Using a performance contract in Pennsylvania requires that the work on the scope, or energy conservation measure (ECM), can yield utility savings. We have developed GESA scopes of work for each facility that address existing maintenance and facility infrastructure needs without spending a dime on superfluous scopes.
- **ADDITIONAL BENEFIT: MANAGEMENT OF MANY PROJECT DELIVERY METHODS** – Reynolds is the ESCo that best understands and readily employs other project delivery methods with our performance contracts. This means that we can help you to plan, budget, procure and manage construction of non-energy-related work using other methods of project delivery, such as state contracts like COSTARS, indefinite quantity contracts through the Keystone Purchasing Network, publicly bid contracts, and the employment of construction management WITH our energy projects.

For clarification on issues raised regarding this proposal or contract negotiations, please contact:

Rick Evans, President
C: 717.443.0943
revans@reynoldssolutions.com

Thank you for this opportunity. Reynolds is eager to work with you and the Upper Adams School District.

Sincerely,

REYNOLDS ENERGY SERVICES, INC.

A handwritten signature in blue ink, appearing to read "Richard A. Evans". The signature is fluid and cursive, with a long horizontal stroke at the end.

Richard A. Evans
President



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ADDENDUM
PRELIMINARY ENHANCED DISTRICT OPTION STUDY

5.1 – ESCP General Information Form

1. Firm Name Reynolds Energy Services, Inc.
Business Address 3300 North 3rd St.
City Harrisburg State PA
County Dauphin Zip Code 17110

2. Names and Titles of Two Contact People

- 1) Rick Evans, President Phone 717.238.5737
- 2) Garrett Lewis, Account Executive Phone 717.238.5737

3. Submittal is for:

N/A Parent Company (List any Division or Branch Offices to be involved in this project)
N/A Division (attach separate list if more than one is to be included)
N/A Subsidiary
Name of Institution: N/A
Address: N/A

4. Date Prepared: March 2, 2018

5. Type of Firm:

Corporation, Partnership Sole Ownership
 Joint Venture

6. Federal Employer Identification Number 80-0197145

7. Year Firm was Established 2008

8. Name and Address of Parent Company, if applicable: Reynolds Enterprises, Inc., 3300 North 3rd St., Harrisburg, PA 17110

9. Former Firm Name(s), if applicable N/A

10. Affirm that the Firm has been conducting business as an ESCO for no less than five years.
Reynolds Energy Services has been conducting business as an ESCO for 10 years.



5.2 – ESCO PA State Qualifications Form

Reynolds Enterprises is prequalified by the PA Department of General Services for the following:

- ✓ Contractor for the Commonwealth’s Guaranteed Energy Savings Program
- ✓ Energy Consultant for the Commonwealth’s Guaranteed Energy Savings Program
- ✓ Statewide Construction Management
- ✓ Statewide Commissioning Agent

Reynolds Enterprises is one of a very select few, if not the only, company currently pre-qualified to provide Guaranteed Energy Savings Agreements (GESAs), Construction Management (Agency), and Building Commissioning professional services by the **Pennsylvania Department of General Services (DGS)**. Our firm is also a prequalified energy service, engineering, and construction company for the **PennSEF program**, which is a collaboration of the **Pennsylvania Treasury Department and the Foundation for Renewable Energy and Environment (FREE)**. Further, Reynolds is currently engaged in the audit and review phase of the federal government’s **General Services Administration (GSA)** Schedule Contracts program to provide Indefinite-Delivery, Indefinite Quantity (IDIQ), long term – engineering, energy auditing, and construction management contracts under **Schedule 03FAC**.

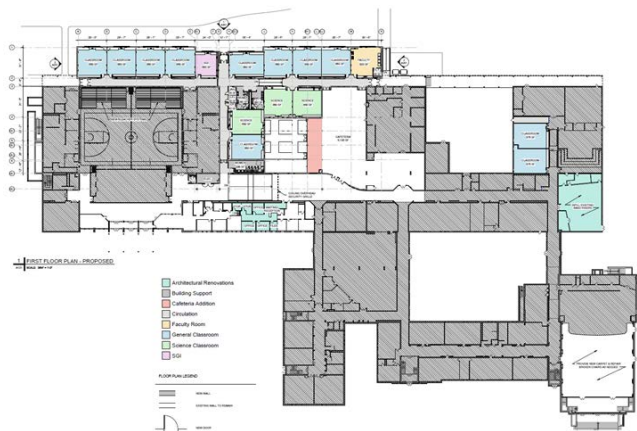
5.3 – ESCO Public Schools Qualification Form

1. Confirm that the Firm is qualified as an ESCO and has successfully completed no less than five (5) guaranteed energy savings projects with Pennsylvania school districts. Provide a list of projects and contact information.

Palmyra Area School District – Palmyra, PA
Middle School Hybrid Addition/Renovation

Owner Contact:

Palmyra Area School District
Darcy Brenner-Smith
Director of Business Affairs
1125 Park Dr.
Palmyra, PA 17078
717.838.3144, ext. 7



Juniata School District – Mifflintown, PA
Elementary School Consolidation Program

Owner Contact:

Juniata County School District
Keith Yarger
Superintendent
75 South Seventh Street
Mifflintown, PA 17059
717.436.2111
kyarger@jcsdk12.org

Midd-West School District – Middleburg, PA
West Snyder Elementary School

Owner Contact:

Midd-West School District
Richard Musselman, Superintendent
568 E. Main St.
Middleburg, PA 17842
570.837.0046



**Neshaminy School District – Langhorne, PA
Neshaminy High School & Tawanka Elementary School**

Owner Contact:

Neshaminy School District
Barb Markowitz, School Board Treasurer
2250 Langhorne-Yardley Road
Langhorne, PA 19047
215.809.6500
bmarkowitz@neshaminy.org



**Shippensburg Area School District – Shippensburg, PA
District-Wide Energy Conservation Project**

Owner Contact:

Neshaminy School District
Barb Markowitz, School Board Treasurer
2250 Langhorne-Yardley Road
Langhorne, PA 19047
215.809.6500
bmarkowitz@neshaminy.org

2. Confirm that the Firm is qualified as an Agency Construction Management firm and has successfully completed no less than five (5) Agency CM projects (outside of ESCO projects) with Pennsylvania school districts that include both major renovation and construction of new schools. Provide a list of projects and contact information.



**School District of the City of York – York, PA
Multiple Projects**

Owner Contact:

School District of the City of York
Dr. Eric Holmes
Superintendent
31 North Pershing Ave.
York, PA 17404
717.849.1433

**York Suburban School District – York, PA
Yorkshire Elementary School**

Owner Contact:

York Suburban School District
Dennis Younkin, PRSBA
Director of Finance and Support Services
1800 Hollywood Dr.
York, PA 14703
717.848.2814



**Southern York County School District – York, PA
Multiple Schools**

Owner Contact:

Southern York County School District
Randy Buffington
Director of Facilities
P.O. Box 128
Glen Rock, PA 17327
717.235.4811 ext. 7281

**Conewago Valley School District – New Oxford, PA
Elementary Schools**

Owner Contact:

Conewago Valley School District
130 Berlin Road
New Oxford, PA 17350



**Eastern York School District – Wrightsville, PA
Eastern York High School**

Owner Contact:

Dr. Darla Pianowski
Eastern York School District
Superintendent
P.O. Box 150
Wrightsville, PA 17368
717.252.1555
dpianowski@eyork.k12.pa.us

3. Confirm that the Firm is qualified as a Commissioning firm and has successfully completed no less than five (5) Commissioning projects (outside of ESCO projects) with Pennsylvania school districts that include both major renovation and construction of new schools. Provide a list of projects and contact information.



Wallingford-Swarthmore School District – Wallingford, PA
Strath Haven Middle School

Owner Contact:
Wallingford-Swarthmore School District
200 S. Providence Rd.
Wallingford, PA 19086

Owen J. Roberts School District – Pottstown, PA
East Coventry Elementary School

Owner Contact:
Owen J. Roberts School District
901 Ridge Road
Pottstown, PA 19465



Marple Newtown School District – Newtown Square, PA
Marple Newtown High School

Owner Contact:
Marple Newtown School District
40 Media Line Road
Newtown Square, PA 19073

Neshaminy School District – Langhorne, PA
Tawanka Elementary School

Owner Contact:
Neshaminy School District
2001 Old Lincoln Highway
Langhorne, PA 19047



Reynolds Proposal for a Guaranteed Energy Savings Contract



State College Area School District – State College, PA
Various Projects

Owner Contact:

State College Area School District
131 W. Nittany Ave.
State College, PA 16801

4. Confirm that the Firm has not been involved with any projects where legal action or injunctions have been sought as a result of the work provided by the Firm. If legal action or injunctions have been sought provide an explanation and attach any opinions that resulted.

No legal proceedings, arbitrations, complaints, or court actions have been filed by an owner against Reynolds Energy Services, Inc., or against any individuals, for any project in which Reynolds provided energy-related services.

5.4 – Executive Summary

Our roots in PA K12 public construction and contracting makes Reynolds Energy Services unique when compared against other ESCOs. We understand how to design solutions that work, and we know how to build those solutions as cost-effectively as possible while maintaining the highest quality control and effective schedule maintenance. What sets us apart? Our team includes on-site construction managers that have years of experience running major construction projects. Our ESCo competitors lack this type of expertise. In addition, Reynolds Energy Services offers the Upper Adams School District:

- **Objective Solutions** – We look for ways to get the most energy efficiency and life out of what you already have and will only recommend measures that make sense and provide true cost savings and value for the district.
- **We understand Education is the Mission** – We do not promote EEMs that will impact occupancy comfort to accomplish additional energy savings.
- **Ability to Provide Evaluations of Third Party Designs** – Our in-house expertise lends itself to be able to critique third party designs and evaluate them for their first cost effectiveness and overall performance.
- **Transparent and Competitive Process** – Reynolds competitively bids all our subcontracts. This allows us to use contractors that are familiar to you and to get the best pricing for the work... *We hand those savings back to you!*

When you hire Reynolds for a hybrid project, you are gaining a partner that can help you make sustainable facility program decisions for the long term. Our clients have access to our staff of over 100 professionals – construction management, preconstruction, estimating, scheduling, energy services, MEP engineering, commissioning and restoration expertise is a phone call away. We do not bill our existing clients to discuss their issues and provide the basis for solutions. We seek to provide value-added services so that our clients pay less and obtain more – in scope and quality.

As you examine our Preliminary Enhanced District Options Study you can begin to understand how we can assist the District and the Design Team to move toward a solution that will provide the upgrades required at the budget set. Our options for project delivery include reduced costs for management and construction using:

- Four or multiple-prime contract public bidding
- Performance (energy) contracts (for energy-using systems renovations and upgrades)
- State Contract bidding and KPN ezIQC contracting
- Hybrid contracts that include components of the above that minimize risk

We don't try to make a square peg fit in a round hole – we only encourage project procurement method(s) that will meet the goals of our client, including energy savings/performance guarantees, contracts with no change orders, design-build construction and/or the equivalent of best value contracting.

5.5 – Project Management Approach

Include information on subcontractor selection, corporate standards, best practices and professional certification. Include an explanation of how your firm’s management team is accountable to UASD for, project milestones and completing a building program within budget and on schedule.

Subcontractor Selection

Reynolds believes that by bidding subcontracted work, we can provide the **best overall value** and maximize the use of energy savings to offset project costs. For most scope items, Reynolds will develop a package of bidding documents describing the scope of work for each sub-trade (e.g., HVAC, electrical, ATC, plumbing, etc.). Reynolds will solicit bids from a short list of contractors that includes firms from our own pre-qualified list of contractors, as well as any local firms the District would like to include given it was a positive experience. The pre-qualification process has the full input of the district. In addition, in our request for bids the base scope of work will be included as well as alternates for consideration by the district should project costs come in below the budget estimate.

Corporate Standards, Best Practices and Professional Certification

Reynolds Project Pillars are fundamental project precepts that our teams bring to every client and drive our exceedingly high corporate standards.

1. *Become your Advocate*

Reynolds approach to program management begins with establishing a partnership. We will be diligent and invested in understanding Upper Adams SD, it’s culture and thought processes, specific project goals and requirements so that we can represent your best interests at design meetings, on the job site, and in the community.

2. *Facilitate Teamwork and Collaboration*

Reynolds experience has taught us that teamwork and collaboration is a dynamic concept. We believe that teamwork and collaboration peaks when professionals with complimentary backgrounds and skills share common project goals. We take the time to understand the goals of our clients and we reinforce them to all team members as they carry out their work.

3. *Standardize Project Communication and Procedures*

Reynolds believes that regular communication with your administration, stakeholders and professionals is vital to the plan and coordination efforts of a successful project. We utilize a variety of tools and mechanisms to ensure that team members identify and commit to objectives and success criteria. Responsibilities of the various stakeholders will be confirmed in a Project Procedures Manual. The Project Procedures Manual will include the project contact directory, *preconstruction schedules, meeting schedules and agendas, team relationships, responsibility matrix and key milestone dates as noted by the team.*

Best Practices in Construction are especially critical, and should be clearly stated – those of high value include the following:

1. Cost Estimating and Bid Procurement

Reynolds provides detailed cost estimating for all the scopes of work involved in the project. To develop our cost estimates, our preconstruction staff uses industry standard software, Timberline Precision Estimating. Pricing is developed from a variety of sources, and we rely on historical cost information derived from recent bid results and the schedules of values from contractors on school projects. We have direct industry sources such as material and equipment suppliers, vendors and subcontractors. These sources have the most current price information. Additionally, we consult with various contractors in the industry to confirm accurate crew sizing and production rates. We also check availability of workers for the various trades in the project location in the time frame of the construction period. Our mechanical, electrical, and plumbing department utilizes software called MC² for estimating, with industry standard services for pricing updates.

2. Self-Performed Work vs. Contracted

Reynolds self-performs almost all the professional services and contracts out for the installation of all the hard construction. Typically, we self-perform our development, engineering, project management, estimating, commissioning and performance assurance, while we subcontract our work for the construction of the project so that competitive pricing can occur, providing for the best value and potential to use local contractors is possible for our clients.

Specifically, Reynolds uses in-house staff for the following services:

- Energy auditing and benchmarking
- Enhanced District Options Studies
- ECM development and engineering
- Cost estimating and bidding
- Scheduling
- Project management and on-site supervision
- Commissioning, training, and performance assurance
- Measurement and verification

Corporate/Professional Certifications

Reynolds has over 100 construction professionals on staff providing an array of services in-house. Our experienced preconstruction team, which includes architectural, civil, electrical, and mechanical experts, can provide the District with invaluable input during budgeting, value engineering, scheduling, and phasing of your project.

Our construction department includes project managers and on-site construction managers who can provide firm control over the construction phase of your project. Our building commissioning experts can ensure your building systems are performing properly by testing and inspecting your equipment. In addition, our energy engineers and energy services experts can provide cost-

effective approaches to energy savings, including identifying energy-saving technologies and practices, upgrading aging equipment, reducing maintenance expenses and utility bills, and improving occupant comfort. Even in emergency situations, Reynolds can assist with restoration services to remedy issues from minor smoke and water damage, to extensive restoration and reconstruction. We have a team of restoration and construction professionals second to none in the industry.

We are the only firm to have been qualified for commissioning, construction management, and guaranteed energy savings work by the Department of General Services!

Project/Construction Management

Reynolds' extensive experience in public school construction will benefit the district in many ways. Reynolds knows how to develop and maintain a construction schedule. Subcontractors know that a Reynolds project will be run by experts that will maintain progress and keep wasted time to a minimum. This means that Reynolds will solicit high-quality subcontractors and get preferred pricing from those subcontractors. Our quality control and safety programs are high caliber, ensuring a high-quality project, expected performance and a safe project jobsite. Lastly, Reynolds' commitment to customer satisfaction means that we will do everything in our power to meet or exceed every expectation of the district.

Reynolds' construction managers carefully plan and coordinate the project to ensure success, safety, and minimal disruption to the school's educational process. During summer work, our weekly meetings will keep the district current with all progress and ensure that goals are being met. Construction progress reports and meeting minutes and all required documentation will be promptly submitted to the district via electronic mail or as the district requires. Bi-weekly meetings may be used during non-critical work periods (between summers).

Reynolds will provide a responsibility matrix, showing the responsibility for every task in the project among the district, Reynolds and our sub-consultants/vendors/suppliers and subcontractors. This communication tool allows all project participants to understand their roles and responsibilities early during the project.

We will develop detailed schedules that allow us to track progress and make adjustments before it is too late. Reynolds uses Primavera's project management suite of software, including Primavera Project Planner (P3) to manage critical path schedules and other software for construction administration management and reporting.

Project Management After Construction

Reynolds then turns its focus to project management after construction, which includes management of the following processes:

- Project Close-Out (including training, turn-over of as-built construction documents, submittals, job correspondence, and other similar information—as well as completion of the punch list items)
- Commissioning of the building systems installed (including testing of each component, each discrete system, and groups of systems acting together as they would during the use of the building—this work occurs both during the summer to test the cooling systems and

the winter to test the heating systems)

- Performance Assurance (where we continue our training of your staff for a full year as we work with them to run the building to maximize performance and minimize energy use—while keeping the occupants comfortable)
- Warranty work is completed as needed—Reynolds never walks away from our clients and can provide you with references for clients where we performed repairs and replacements outside of the warranty timeframes.

Adherence to Project Schedule

Reynolds prides itself in the on-time completion of our projects. Reynolds' staff will be on-site daily, monitoring the schedule as construction progresses, and identifying potential variances between scheduled and completion dates. Also, our sub-contractors will be held to the contractual obligations for schedule updates, typically through bi-weekly updates. As we update the schedule, the information will be reviewed for compliance with the requirements of the approved baseline construction schedule and milestones. If the updated schedule shows that our sub-contractors are falling behind, we will work with them to devise and implement a recovery plan that will minimize any negative impact to scheduled completion dates. We will also review the schedules for work not started or incomplete, and ensure that they adjust the schedule to meet the completion dates.

Adherence to a Project Budget

Reynolds approach to projects is to **save time, save money and help our clients reduce costs** – allowing for potential addition of project scope or reduction of the project budget. Creating a savings/cost reduction trend in projects is important from the beginning. This occurs in a collaborative effort with the client and the design team.

Outside of combining project delivery methodologies and using energy savings to buy down the costs of capital improvements – ways in which we generate cost savings to maintain a budget, include but are not limited to:

1. Soft Cost Savings and Avoidance

Savings on the costs of a project that are not “bricks and mortar” items should not be ignored. Reynolds will work with the Upper Adams School District (UASD) to find ways to reduce costs outside of the construction costs, including document management, streamlining of the permitting process, negotiating professional services fees, etc.

2. Value Engineering

True value engineering identifies ways to build and renovate in a more economical fashion while still meeting the District's program intent. For example, the Preliminary EDOS has Reynolds project alternate options One and Two that demonstrate our commitment to thinking ‘outside the box’ to accomplish the educational program wants/needs – while maintaining public fiscal responsibility.

3. Scope Reduction Options

During the traditional design process, the owner explains to the architect just what is needed in the finished building project. The architect interprets the information provided by the owner and creates a design that the architect feels will best address the needs as

outlined. The design **MUST** be reviewed by project stakeholders and Reynolds to make sure that not only will the programmatic needs be met, but also that there are no design scopes included that are optional or potentially not needed. The “needs” and the “wants” must be sorted.

4. Construction Phase Cost Avoidance

Reynolds fights to avoid change orders. This battle is one of the key advantages of considering multiple project delivery methods. We use the GESA contract when applicable – because they strictly eliminate any threat to the District of project change orders. As your Agency Construction Manager on traditional public procurement projects, the key to lowering change orders is our field staff’s knowledge of the documents better than anyone on the site, and being able to effectively reduce or eliminate change orders. Potential issues are targeted early to minimize any additional work.

5. Adherence to Project Schedule

If a project finishes late, additional costs are generated—either from owner operating costs or due to delay claims from the contractors. Reynolds prides itself in the on-time completion of our projects and strives to meet every completion date. Note, under the GESA contract construction schedules can be significantly expedited because the work is delivered using a design/build contract. A schedule expedited under the GESA reduces overall construction costs and eliminates classroom disruption. ***We have completed nearly \$12 Million of construction between the last day of school and the first day of school the following school year.***

5.6 – Project Scope of Work

1. Energy Savings

Energy Use and Cost Summary

The following tables and figures illustrate the total baseline energy use and cost of the five UASD buildings assessed.

TABLE: Annual Utility Summary by Building

Building Name	Electric			Fuels		TOTAL	
	kWh	kW	\$	ccf	\$	\$	\$/sf-yr
Arendtsville Elementary School	148,960	70	\$ 13,647	12,540	\$ 10,331	\$ 23,978	\$ 0.62
Bendersville Elementary School	161,920	68	\$ 14,484	14,030	\$ 11,773	\$ 26,257	\$ 0.68
Biglerville Elementary School	670,087	400	\$ 61,655	18,580	\$ 14,743	\$ 76,398	\$ 1.19
Upper Adams MS/Biglerville HS	2,113,750	635	\$ 167,399	63,970	\$ 49,525	\$ 216,925	\$ 1.11
TOTAL	3,094,717		\$ 257,185	109,120	\$ 86,373	\$ 343,558	\$ 1.02

Based on the information available, UASD spends about **\$1.02** per square foot per year on average on major utilities, not including water and sewer. This is in line with the expected cost intensity for buildings of this type and size of between **\$0.90 - \$1.10 per square foot**. Electric demand data and water and sewer data were unavailable for this analysis. The distribution provider (Met-Ed) being known, we assumed that the buildings were on the ME-GSMD rate. Using this tariff and the associated consumption per billing period, we estimated the demand used monthly per facility. These values are shown in red in the table above and indicate the estimated peak demand values.

The following figures show the monthly use and cost profile of the same data aggregated for all five buildings.

FIGURE: Monthly Energy Use Profile in MMBTU

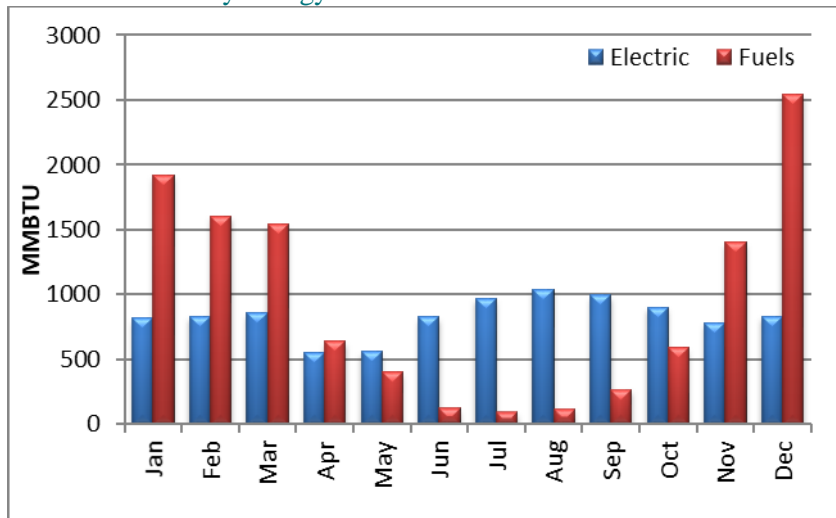
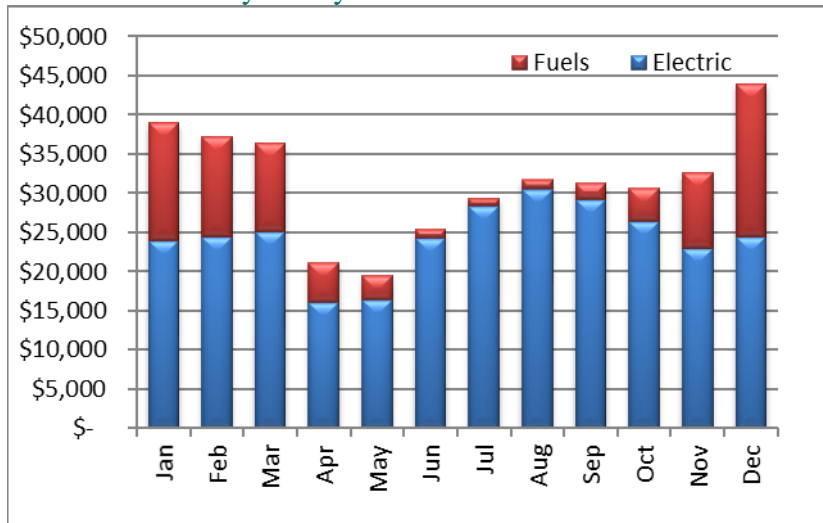


FIGURE: Monthly Utility Cost Profile



Electric is by far the largest component of the District’s utility expenditures, accounting for more than 70% of the energy costs.

Benchmarking Analysis

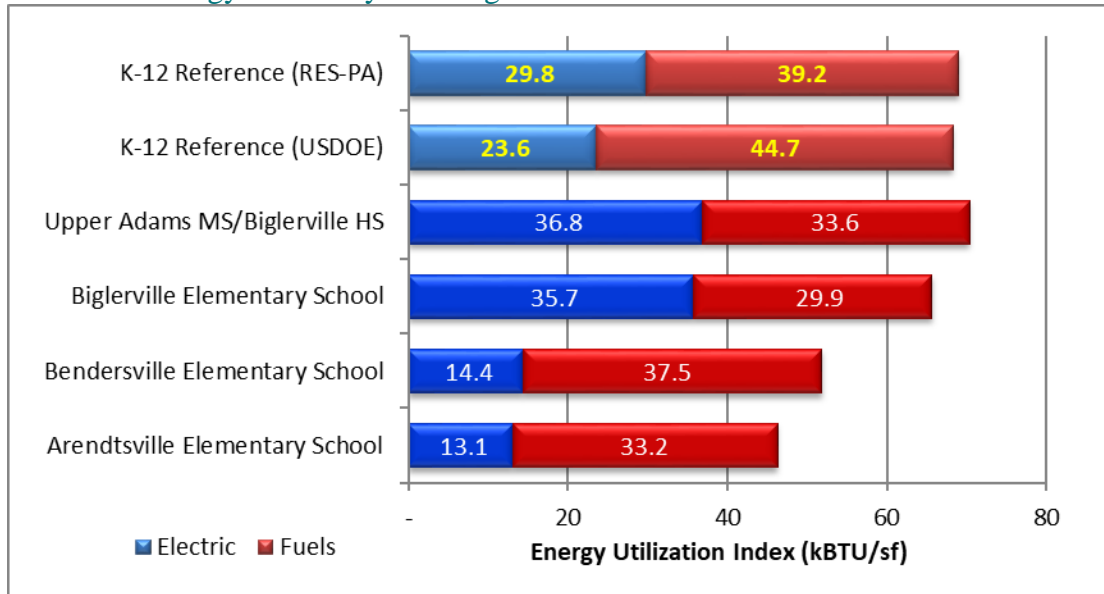
The energy use intensity (EUI) normalizes building energy use in units of kBТУs per square foot for electric and natural gas. This allows us to compare the buildings to the expected average use of peer buildings as well as to one another. Peer buildings are education buildings included in Reynolds’ database of hundreds of Pennsylvania school buildings. The following table summarizes the energy and cost indices for the five buildings included in this assessment.

TABLE: Resource and Cost Indices by Building

Building Name	RESOURCES		
	Electric kBТУ/sf-yr	Fuels BTU/sf-y	Total Energy kBТУ/sf-yr
Arendtsville Elementary School	13.1	33.2	46.3
Bendersville Elementary School	14.4	37.5	51.9
Biglerville Elementary School	35.7	29.9	65.6
Upper Adams MS/Biglerville HS	36.8	33.6	70.4
<i>K-12 Reference (USDOE)</i>	<i>23.6</i>	<i>44.7</i>	<i>68.3</i>
<i>K-12 Reference (RES-PA)</i>	<i>29.8</i>	<i>39.2</i>	<i>69.0</i>
ALL BUILDINGS	31.3	33.3	64.6

The following figure shows the energy intensity of each building compared to the reference indices (U.S. Department of Energy 2012 CBECS data and Reynolds Pennsylvania K-12 database). The Middle School/High School and Biglerville Elementary have electric indices above average, which would indicate potential to save energy in that area. The HVAC systems however are major reasons as to the higher index shown. On average, UASD is performing around average on total EUI shown. Arendtsville and Bendersville Elementary Schools are not fully air-conditioned, likely accounting for the lower than average electric indices shown.

FIGURE: Energy Indices by Building



Energy Star Buildings

The Energy Star Buildings Program is a long standing and nationally recognized method of measuring and improving building performance through benchmarking. By entering building physical and usage characteristics and energy use data into the Energy Star Portfolio Manager, each property receives a baseline score on a scale of 1 to 100. An Energy Star score of 50 represents the median of all similar buildings in a particular area (i.e., schools in the Mid Atlantic U.S.). A score of 75 is needed to achieve the Energy Star designation as a well performing energy-efficient building.

The five buildings included in this report have been entered into the Energy Star Portfolio Manager by Reynolds. This is a great first step in understanding the savings potential of these buildings. The resulting scoring is shown in the table below.

FIGURE: Energy Star Buildings Ratings

Property Name	ENERGY STAR Score (1-100)	Site EUI (kBtu/ft ²)	National Median Site EUI (kBtu/ft ²)	% Diff from National Median Site EUI	Energy Cost Intensity (\$/ft ²)
Arendtsville Elementary School	89	45.9	73.8	-38%	\$0.62
Bendersville Elementary School	69	51.0	61.5	-17%	\$0.68
Biglerville Elementary School	64	64.8	74.1	-13%	\$1.19
Upper Adams MS/Biglerville HS	39	68.2	62.0	10%	\$1.11

The Energy Star analysis confirms Reynolds’ benchmarking results showing the most savings potential in the Middle School/High School building as well as some minor potential amongst the other facilities. Both Arendtsville and Bendersville Elementary Schools have minimal mechanical

Reynolds Proposal for a Guaranteed Energy Savings Contract

cooling which could be skewing their scores to be higher than expected. These buildings also have little use outside of normal school operations.

Savings Potential Analysis

From this analysis we can determine where the most potential exists to improve energy performance and where to focus attention on facility improvement measures. There is likely potential for energy performance improvements in all district buildings, with the most potential at the Biglerville Elementary School and at the Middle School/High School. In our experience, target indices range from 60 to 75 kBtu/ft² for average school buildings and 45 to 60 kBTU/ft² for well performing buildings. Savings of 8% to 10% may be achievable district-wide through an energy conservation program.

Using an achievable initial target score of 50 for the MS/HS and 75 for the elementary schools, we can quantify the savings potential for this portfolio of buildings as shown in the following table:

FIGURE: Energy Star Buildings Target Scores and Savings

Property Name	Target ENERGY STAR Score	Target Site EUI (kBtu/ft ²)	Target % Savings	Target Energy Cost Intensity (\$/ft ²)	Target Savings (\$/year)
Bendersville Elementary School	75	48.1	6%	\$0.64	\$1,493
Biglerville Elementary School	75	58.0	10%	\$1.07	\$8,017
Upper Adams MS/Biglerville HS	60	56.6	17%	\$0.92	\$36,896
TARGET FOR ALL BUILDINGS:			15%	\$0.91	\$46,406

Analysis shows that achieving a minimum target score of 60 at the MS/HS (equivalent to the median score for peer buildings) and 75 at the other facilities, overall energy savings of more than \$46,000 per year is possible. Once a successful program is established to reach this goal, further reductions can be sought toward reaching the goal of becoming Energy Star certified across all buildings.

Preliminary Savings Analysis

The following table illustrates the estimated savings potential of implementing all the Facility Improvement Measures (FIMs) presented in the next section.

TABLE: Annual Energy and Cost Savings by Measure

EEM	ELECTRIC			FUELS		WATER/SEWER		O&M	TOTAL
	kWh	kW	\$	ccf	\$	kgal	\$	\$	\$
1 Lighting System Improvements	271,115	1,393	\$ 24,742	-	\$ -	-	\$ -	\$ 3,600	\$ 28,342
2 Arhitectural and Code Improvements	21,138	-	\$ 1,374	1,811	\$ 1,433	-	\$ -	\$ 600	\$ 3,407
3 HVAC and DDC System Improvements	(160,247)	(375)	\$ (12,332)	-	\$ -	-	\$ -	\$ 2,800	\$ (9,532)
4 Electrical System Improvements	-	-	\$ -	-	\$ -	-	\$ -	\$ 300	\$ 300
5 Plumbing and Water Conservation	-	-	\$ -	-	\$ -	368	\$ 2,064	\$ 900	\$ 2,964
6 Existing Building Cx Program	84,586	-	\$ 5,498	3,008	\$ 2,366	-	\$ -	\$ 6,500	\$ 14,364
TOTAL	216,591	1,018	\$ 19,282	4,819	\$ 3,798	368	\$ 2,064	\$14,700	\$ 39,844

2. Facility Improvement Measures

FIM 1: Lighting System Improvements

Observations

At the HS/MS complex, T8 linear fluorescent is the predominant lighting technology with 4 ft. 32-watt lamps. Most fixtures are 2x4 lay-in troffers with the exception of a few rooms in the Middle School that have pendant up lighting. The locker rooms are exposed 4 ft. single lamp fixtures with vapor wrapped lamps. The gymnasiums have T-5 2x4 linear fluorescent high bay fixtures installed. No occupancy sensors exist for lighting control, nor are there any lighting controls as part of the building automation system (BAS). All exterior wall-pack fixtures and pole lights are high intensity discharge (HID) technology.

T8 linear fluorescent technology is also predominant in the three elementary school buildings, with both 32-watt and 28-watt lamps (mostly at Biglerville ES) present. Most fixtures are 2x4 lay-in troffers. The gymnasiums have 2x4 linear fluorescent high bays installed. Some spaces such as the library and art room at Biglerville ES have pendant mounted fixtures. No passive lighting controls such as occupancy sensors appear to be present. All exterior wall-pack fixtures and pole lights, where they exist, are high intensity discharge (HID) technology.

Recommended Scope – Interior Lighting (All Buildings Indicated)

- Convert all interior lighting to LED. Linear sources will be replaced with direct wire LED tubes. Due to the elimination of the ballast, direct wire LED tubes are a more efficient solution than ballast compatible LED tubes. These lamps preserve the look of the existing fixture and provide a cost-effective method to benefit from the reduced energy use and increased life span of LED technology.
- Re-lamp screw-in compact fluorescent and incandescent fixtures using an LED product. Re-lamp decorative pin based CFL fixtures using a ballast compatible lamp.
- Add occupancy/vacancy sensors in select areas.
- The gym fixtures shall be converted using an LED retrofit kit.

Recommended Scope – Exterior Lighting

- Replace/retrofit exterior wall mounted lighting fixtures new LED equivalents.
- Replace/retrofit parking lot pole lights with new LED heads and photocell controls.
- Add new lighting poles and exterior lighting to the site (Arendtsville and Bendersville only)

FIM 2: Architectural and Code Improvements

Biglerville High School - Athletic Center

Observations

The locker rooms and team rooms are in need of complete renovation, including repairs, finishes, ADA-compliance, toilets and shower areas and new lockers. Locker room entry doors are in narrow form the hallway and are not handicap accessible. Wrestling room doors and finishes are worn. In the upper gym, wall pads are needed behind the backboards. In public restrooms, the wall

tile is in good condition, but floors need attention, and the rooms need ADA-compliance modifications.

Recommended Scope

- Provide new lockers, flooring, painting, benches, ceiling tiles and appropriate new finishes to renovate the locker rooms and team rooms
- Provide new flooring, painting, and ceiling tiles and appropriate new finishes to renovate the corridors and stairwells
- Provide new wall paint and padding in the wrestling room.
- Provide new wall padding and additional sound paneling in the gym.

Upper Adams Middle School

Observations

The building is in generally good shape. Gang toilet rooms have worn finishes and need to be updated for ADA, including partitions. Art Rooms are in need of new casework. In classrooms, the closet doors are old and have knobs and wood casing. Casework around the sink is old and in need of replacement. Finishes in classrooms are fair and could use an update. Carpet in 12 classrooms needs to be replaced.

Two wheelchair lifts installed at the stairs in the hallways are in poor condition. Adding ramps in these areas is not feasible. The MS administrative office is a principal's office and conference room in the middle of the wing and not conducive to proper management.

Classroom doors do not have 18" on the latch side. It is an existing condition and they are not so deep that you can't reach the lever from the corridor. All corridor doors have new lever hardware. Weather stripping is required on various exterior doors.

Recommended Scope

- Provide new flooring, painting, ceiling tiles, and appropriate new finishes to renovate the common restrooms (Rooms 214 and 216 on drawings).
- Provide new Art Room casework and Home Ec. Room counters.
- Provide new closet levers and classroom casework.
- Provide Cafeteria window treatment.
- Provide new marker boards in lieu of existing chalkboards in select classrooms.
- Provide new chair lifts.
- Provide new weather-stripping at select exterior doors.
- Life Skills classroom addition

Biglerville Elementary School

Observations

The building was originally constructed in 1993 with classroom additions in 2005. Wood casement windows are deteriorating, with the bottom sash of many windows rotting through. The gutter and downspout system is also leaking terribly and in need of replacement. There are some regular

doorknobs still present that do not meet current code requirements. Minor repointing of the brick and masonry is needed. Carpet existing throughout the building. Ceiling tiles are damaged in some areas.

Recommended Scope

- Provide new aluminum windows, trim and paint and associated window treatments.
- Provide new gutters and downspouts.
- Provide new marker boards in lieu of existing chalkboards in select classrooms.

Arendtsville and Bendersville Elementary Schools

Observations

These buildings were most recently renovated and added on to in 1989. The buildings are very similar in construction. The original wing of each building is very dated with original single pane windows. In 1989 EIFS was installed where full window walls existed. Interior and exterior doors appear to be original. Corridor finishes are good with vinyl floor tile (VCT), acoustical ceiling tile (ACT) and glazed block walls to mid-height (4-5') with plaster above. Corridor doors have levers; interior doors are knobs. Corridor doors do not have 18" on the latch side and have single pane glass and wood door jambs.

The Arendtsville gym stage is not handicap accessible. Classrooms were updated with VCT and ACT in 1989. Many still have old chalkboards with wood chalk trays. Some markerboards exist. Arendtsville classrooms have old casework and glass block windows to the corridor. Casework at Bendersville is in good shape. The gang toilet rooms at office need full renovation, including ADA.

The 1989 Wing is in good shape, with terrazzo corridor floors, VCT floors in classrooms, and newer windows. Walls are painted CMU. Casework is dated due to pastel colors, but appears to be in good shape. Corridor doors have levers; interior doors are knobs. Bathrooms are close to current ADA, but need some work. Corridor doors have 18" on the latch side and are code compliant. They have wire glass. The overall roof dates back to 1989.

Recommended Scope

- Provide new windows in old section and exterior doors with associated new trim and paint.
- Provide Air conditioning / DOAS throughout
- Provide expansion joint caulking and repointing in select locations.
- Address ADA compliance measures during interior architectural renovation work.
- In the original building section provide the following:
 - New chair lift for the stage area.
 - New marker boards in lieu of existing chalkboards.
- In the 1989 building addition provide the following:
 - New classroom door knobs.
 - New marker boards in lieu of existing chalkboards.

FIM 3: HVAC and DDC Improvements

Biglerville High School

Observations

The primary HVAC system consists of VAV rooftop units with hot water heat. All of the AAON rooftop units have energy recovery wheels and are approaching 20 years in age. Staff has indicated the need for compressor replacements and servicing on nearly half of the units to date, as well as the possible replacement of AC-8. All of the units utilize R-22 refrigerant which is being phased out in all new HVAC refrigeration applications. The DDC cards associated to the controls of each VAV box (~25%) are in need of replacement.

The athletic center was built in 1972 and there have not been significant modifications to the HVAC. Pneumatic controls currently exist and there are noticeable air and oil leaks within that system.

Boilers are generally in good condition. Water treatment has been lacking for many years. Recently the district contracted to have water treatment provided for the building hot water system. Leaks are anticipated once debris and scale is removed through the treatment process. Thus, the integrity of the entire hot water system, including the boilers is in question.

Recommended Scope

- Provide all new HVAC terminal equipment in the locker rooms, team rooms and corridors.
- Investigate integrity of both heating hot water piping and existing domestic hot water tank and domestic water piping. Provide tank inspection and limited pipe cutting and systems analyses.
- Provide new packaged rooftop units and necessary ductwork to provide air conditioning to the gymnasium.
- Remove the existing pneumatic controls and provide new direct digital controls (DDC) on all new HVAC equipment installed. Integrate all new HVAC equipment within the district-wide building automation system (BAS) head end.
- Provide new control cards on approximately 50% of the fan powered VAV boxes. Install and recommission the controllers to adequately actuate valves and implement controls sequences to optimize fan powered box performance.
- Integrate any new lighting occupancy controls to allow for demand controlled ventilation (DCV) in select spaces with varying occupancy (applies to all areas of the High School/Middle School/Athletic Center Complex where applicable).
- Expand DAO

Biglerville Elementary School

Observations

The facility is served primarily by variable air volume (VAV) air handlers with hot water heat and DX coils. The air handlers supply air to dedicated fan powered VAV boxes associated to individual spaces. The air handlers and VAV boxes are very difficult to access due to the locations above the ceiling. Removal and replacement of these air-side units (AHUs and boxes) will likely be difficult and costly. Three of the five large condensing units are roof mounted.

Pneumatic actuation and building controls currently exist and are integrated within the direct digital controls (DDC) system. Economizer capabilities are limited and are being addressed currently. The classroom additions are served by residential heat-pump split systems.

New boilers were installed in 2015 and the district optimizes the building hot water controls and variable speed pumping.

The Melink system in the kitchen has been disabled due to a failed VFD. The hood is operated manually from the switch. The ATC system controls the kitchen makeup air unit.

Recommended Scope

- Integrate any new lighting occupancy controls to allow for demand controlled ventilation (DCV) in select spaces with varying occupancy.
- Repair and recommission the Melink system.
- Replace two 40-ton VAV units, remaining units will need to be address in the next several years

Arendtsville and Bendersville Elementary Schools

Observations

The facility is served primarily with hot water unit ventilators. Limited cooling exists via, window A/C units, rooftop units, and mini-split system air conditioners. Condensing boilers were installed in 2007 and the district optimizes the building hot water controls and variable speed pumping. Water treatment may be an issue at these facilities. Recently the district contracted for implementation of a water treatment program on the building heating hot water systems. Thus, the integrity of the piping is unknown.

Pneumatic actuation and building controls currently exist and are integrated within the direct digital controls (DDC) system. DDC controllers located in the basement are not adequately protected and are subject to humidity damage.

The art classroom at Arendtsville has been identified to be very cold during the winter months. The location is farthest from the boiler room and has significant exterior wall area

Recommended Scope

- Install a dedicated outdoor air system (DOAS) to provide ventilation air to the building. DOAS system will comprise of new rooftop units and associated new ductwork to the classrooms and offices.
- Modify outside air intake on existing unit ventilators to accommodate for a new ventilation system.
- Investigate integrity of both heating hot water piping and existing domestic hot water piping. Provide limited pipe cutting and systems analyses.
- Remove existing ceiling fans and install a new packaged rooftop unit and necessary ductwork to provide air conditioning to the gymnasium.

- Provide new direct digital controls (DDC) on all new HVAC equipment installed and integrate all HVAC equipment within the district-wide building automation system (BAS) head end.
- Refurbish existing heating and ventilation units serving the classrooms and offices.
 - Clean existing heating coils, fans and housings.
 - Test units for proper operation including freeze protection.
 - Test units for proper operation including motors and freeze protection.
 - Replace fan motors as needed.

FIM 4: Electrical System Improvements

Observations

High School Athletic Center: The electric service in the athletic center is in fair condition. However, subpanels are original Federal Pacific panels. A separate electric service exists for the Upper Adams Middle School section.

Arendtsville and Bendersville Elementary: The exterior emergency generators at each building date back to 1989 and are in need of replacement.

Recommended Scope

- High School Athletic Center: Replace all of the Federal Pacific electrical subpanels in kind.
- Arendtsville and Bendersville Elementary: Replace the existing emergency generators with new generators.

FIM 5: Plumbing and Water Conservation

Observations

High School Athletic Center: The domestic hot water system has been updated with a new boiler. However, the piping, valves, water treatment, storage tank and other appurtenances are in need of replacement and insulation.

Arendtsville and Bendersville Elementary: Gang bathrooms in the original section are in need of upgrades, including replacement of china. The domestic hot water heaters have been replaced within the past 10-15 years.

Biglerville Elementary: The domestic hot water heaters have been replaced within the past five years. The water softener is older but working well. The kitchen is experiencing issues with the drains.

Recommended Scope – All Buildings

- Replace the remaining standard or high flow toilets (3.5 gallons per flush or greater) with new low-flow toilets (1.28 gallons per flush), including china and valves as appropriate.
- Replace urinals where required, including accommodation for ADA compliance. Where Replace flush valves on existing-to-remain urinals to low flow as appropriate.
- Replace aerators on all kitchen and bathroom faucets with low-flow aerators (1.5 gallons per minute or less).

- In the Athletic Center, replace all showerheads (2.5 gallons per minute or greater) with new high pressure, efficient flow (1.5-2.0 gallons per minute) showerheads with shut off buttons or levers.
- At Biglerville ES, scope sanitary lines and check grease trap. Jet wash sanitary lines as required.

FIM 6: Existing Building Commissioning (EBCx) Program

Existing Building Commissioning (EBCx), often referred to as retro-commissioning (RCx), is a proven, systematic process of improving the performance of an existing building with minimal upfront investment. Using a whole-building systems approach, EBCx seeks to identify no-cost and low-cost operational improvements that will increase occupant comfort and save energy. An EBCx program can extend the life and performance of existing systems with paybacks of three years or less.

Our approach to EBCx focuses on working with the owner and the building operators to ensure the building is meeting their functional needs as efficiently as possible. The principal goal is threefold – Reduce the building load to only what is needed when occupied; restore system capabilities to efficiently meet the building load; and optimize heating and cooling plant operation to effectively reject or add heat to the system. To that end, Reynolds has developed a multi-phase EBCx process. The first phase focuses on planning and goal setting; the second phase involves issue investigation, developing corrective actions scope and plan to implement; the third phase is implementation of the corrective actions; and the final phase is documentation of process and validation of results. This process is further defined in the table below.

<p>PHASE 1: PLANNING</p> <p>Establish Objectives</p> <ul style="list-style-type: none"> • Obtain cost-effective energy savings • Identify potential health and safety issues; bring to owner’s attention • Assemble a list of recommended repairs/improvements/strategies • Adjust and optimize sequence of operations of major systems • Implement maintenance, repairs and sensor calibration • Provide training and documentation to customer for savings persistence <p>Develop EBCx Plan</p> <ul style="list-style-type: none"> • Set specific goals and objectives • Establish schedule and tasks (cooling and heating seasons) • Develop list of systems to be investigated • Select appropriate testing and monitoring plan/procedures
<p>PHASE 2: INVESTIGATION AND CORRECTIVE ACTIONS</p> <p>Investigation/Testing</p> <ul style="list-style-type: none"> • Gather and review existing documentation • Perform functional testing • Perform diagnostic logging/metering • Analyze test data

<ul style="list-style-type: none">• Complete system testing forms and reports• Compile a master list of findings and deficiencies <p>Corrective Actions List/Plan</p> <ul style="list-style-type: none">• Provide recommendations and prioritization of corrective actions• Review issues and recommended corrective actions with owner <p>Develop a consensus implementation plan with owner</p>
PHASE 3: IMPLEMENTATION
<p>Implementation</p> <ul style="list-style-type: none">• EBCx team: Make simple adjustments (schedule/set point tuning)• In-house staff: Perform PM tasks identified and minor repairs depending on capabilities• Subcontracted specialties: Outsource corrective actions such as balancing and control sequence reprogramming
PHASE 4: CLOSEOUT AND VERIFICATION
<p>Final deliverable to customer</p> <ul style="list-style-type: none">• Develop preventative maintenance (PM) manual and checklists• Update sequence of operation/design intent for each system• Prepare final report• Staff training• Hand-off to customer <p>Verification</p> <ul style="list-style-type: none">• Monitor trend data to validate proper system operation and building conditions• Track utility data to verify energy savings.

Common Issues Discovered During Existing Building Commissioning

The number and severity of issues discovered through the EBCx process can differ widely by building. The following is a list of commonly-found issues.

- Building schedules not adjusted to allow for maximum energy savings
- Standard space set-points not implemented
- Sequences for equipment not properly commissioned during construction phase
- Ongoing occupant comfort complaints due to temperature or humidity
- Building Automation Systems graphical user interface not displaying accurate information.
- Original air and water system balancing set-points implemented during construction may have drifted over time
- Negative air pressure causes infiltration of raw outdoor air and comfort issues
- Simultaneous heating and cooling causes energy waste

5.7 – Financial Analysis

1A. Project Financial Summary

Biglerville Elementary School and Upper Adams MS/Biglerville HS

Upper Adams School District					
Energy Project Financial Overview					
EEM #	EEM Name	EEM Construction Cost	Annual Resource Savings	Annual Operational Savings	Potential Act 129 Incentive
Biglerville Elementary School					
1	Lighting System Improvements	\$ 246,467	\$ 3,487	\$ 1,600	\$ 1,877
2	Architectural and Code Improvements	\$ 868,110	\$ -	\$ -	\$ -
3	HVAC and DDC System Improvements	\$ 1,702,517	\$ 1,307	\$ -	\$ -
6	Existing Building Cx Program	\$ 34,231	\$ 1,309	\$ -	\$ -
Building Totals		\$ 2,851,325	\$ 6,103	\$ 1,600	\$ 1,877
Upper Adams MS/Biglerville HS/DAO					
1	Lighting System Improvements	\$ 469,670	\$ 17,038	\$ -	\$ 9,408
2	Architectural and Code Improvements	\$ 2,110,991	\$ 2,364	\$ -	\$ -
3	HVAC and DDC System Improvements	\$ 1,460,742	\$ (8,156)	\$ -	\$ -
4	Electrical System Improvements	\$ 136,136	\$ -	\$ -	\$ -
5	Plumbing and Water Conservation	\$ 59,900	\$ 72	\$ -	\$ -
6	Existing Building Cx Program	\$ 39,820	\$ 9,729	\$ 6,500	\$ -
Building Totals		\$ 4,277,259	\$ 21,047	\$ 6,500	\$ 9,408

1B. Project Financial Summary

Arendtsville and Bendersville Elementary Schools

Upper Adams School District					
Energy Project Financial Overview					
EEM #	EEM Name	EEM Construction Cost	Annual Resource Savings	Annual Operational Savings	Potential Act 129 Incentive
Arendtsville Elementary School					
1	Lighting System Improvements	\$ 150,145	\$ 2,119	\$ 1,000	\$ 1,141
2	Architectural and Code Improvements	\$ 619,476	\$ 207	\$ 300	\$ -
3	HVAC and DDC System Improvements	\$ 1,236,894	\$ (2,839)	\$ 1,400	\$ -
4	Electrical System Improvements	\$ 103,931	\$ -	\$ 150	\$ -
5	Plumbing and Water Conservation	\$ 48,501	\$ 996	\$ 450	\$ -
6	Existing Building Cx Program	\$ 53,905	\$ 449	\$ -	\$ -
Building Totals		\$ 2,214,000	\$ 932	\$ 3,300	\$ 1,141
Bendersville Elementary School					
1	Lighting System Improvements	\$ 149,314	\$ 2,098	\$ 1,000	\$ 1,129
2	Architectural and Code Improvements	\$ 481,780	\$ 235	\$ 300	\$ -
3	HVAC and DDC System Improvements	\$ 1,233,122	\$ (2,644)	\$ 1,400	\$ -
4	Electrical System Improvements	\$ 103,931	\$ -	\$ 150	\$ -
5	Plumbing and Water Conservation	\$ 48,501	\$ 996	\$ 450	\$ -
6	Existing Building Cx Program	\$ 53,351	\$ 499	\$ -	\$ -
Building Totals		\$ 2,070,000	\$ 1,184	\$ 3,300	\$ 1,129

Reynolds Proposal for a Guaranteed Energy Savings Contract

2. Project Cash Flow

SCHEDULE B	UPPER ADAMS SCHOOL DISTRICT
Cash Flow Analysis	Guaranteed Energy Savings Contract

Financed Project Cost (1):	\$11,412,584	Escalation Rates by Utility & Fuel	
Finance Term (years):	20	Electric:	3.0%
Annualized Interest Rate:	3.250%	Natural Gas:	3.0%
Accrued Construction Interest:	\$ (0)	Fuel Oil:	3.0%
		Water:	3.0%
		Other:	3.0%
		Operational:	3.0%
		Escalation Rates for Annual Fees:	2.0%
Estimated Utility Rebates (3):	\$ 13,556		

Year	Electric Cost Savings	Natural Gas Cost Savings	Water Cost Savings	Operational Cost Savings	Total Cost Savings	Guaranteed Savings	Avoided Capital Savings	Annual M&V Fees	Financing Payment	Net Savings	Cumulative Savings
1	\$ 23,404	\$ 3,798	\$ 2,064	\$ 14,700	\$ 43,966	\$ 41,246	\$ 735,534		\$ (776,780)	\$ -	\$ -
2	\$ 24,106	\$ 3,912	\$ 2,126	\$ 15,141	\$ 45,285	\$ 42,483	\$ 729,900	\$ 4,397	\$ (776,780)	\$ -	\$ -
3	\$ 24,829	\$ 4,030	\$ 2,190	\$ 15,595	\$ 46,644	\$ 43,758	\$ 728,516	\$ 4,507	\$ (776,780)	\$ -	\$ -
4	\$ 25,574	\$ 4,151	\$ 2,255	\$ 16,063	\$ 48,043	\$ 45,070	\$ 727,091	\$ 4,619	\$ (776,780)	\$ -	\$ -
5	\$ 26,341	\$ 4,275	\$ 2,323	\$ 16,545	\$ 49,484	\$ 46,423	\$ 725,623	\$ 4,735	\$ (776,780)	\$ -	\$ -
6	\$ 27,131	\$ 4,403	\$ 2,393	\$ 17,041	\$ 50,969	\$ 47,815	\$ 724,112	\$ 4,853	\$ (776,780)	\$ -	\$ -
7	\$ 27,945	\$ 4,536	\$ 2,465	\$ 17,553	\$ 52,498	\$ 49,250	\$ 722,556	\$ 4,974	\$ (776,780)	\$ -	\$ -
8	\$ 28,784	\$ 4,672	\$ 2,538	\$ 18,079	\$ 54,073	\$ 50,727	\$ 720,954	\$ 5,099	\$ (776,780)	\$ -	\$ -
9	\$ 29,647	\$ 4,812	\$ 2,615	\$ 18,622	\$ 55,695	\$ 52,249	\$ 719,305	\$ 5,226	\$ (776,780)	\$ -	\$ -
10	\$ 30,536	\$ 4,956	\$ 2,693	\$ 19,180	\$ 57,366	\$ 53,817	\$ 717,607	\$ 5,357	\$ (776,780)	\$ -	\$ -
11	\$ 31,453	\$ 5,105	\$ 2,774	\$ 9,878	\$ 49,209	\$ 45,553	\$ 725,736	\$ 5,491	\$ (776,780)	\$ -	\$ -
12	\$ 32,396	\$ 5,258	\$ 2,857	\$ 10,174	\$ 50,685	\$ 46,920	\$ 724,232	\$ 5,628	\$ (776,780)	\$ -	\$ -
13	\$ 33,368	\$ 5,416	\$ 2,943	\$ 10,479	\$ 52,206	\$ 48,327	\$ 722,684	\$ 5,769	\$ (776,780)	\$ -	\$ -
14	\$ 34,369	\$ 5,578	\$ 3,031	\$ 10,794	\$ 53,772	\$ 49,777	\$ 721,090	\$ 5,913	\$ (776,780)	\$ -	\$ -
15	\$ 35,400	\$ 5,746	\$ 3,122	\$ 11,118	\$ 55,385	\$ 51,271	\$ 719,449	\$ 6,061	\$ (776,780)	\$ -	\$ -
16	\$ 36,462	\$ 5,918	\$ 3,216	\$ -	\$ 45,596	\$ 41,358	\$ 729,210	\$ 6,212	\$ (776,780)	\$ -	\$ -
17	\$ 37,556	\$ 6,095	\$ 3,312	\$ -	\$ 46,964	\$ 42,598	\$ 727,814	\$ 6,368	\$ (776,780)	\$ -	\$ -
18	\$ 38,683	\$ 6,278	\$ 3,411	\$ -	\$ 48,372	\$ 43,876	\$ 726,377	\$ 6,527	\$ (776,780)	\$ -	\$ -
19	\$ 39,843	\$ 6,467	\$ 3,514	\$ -	\$ 49,824	\$ 45,193	\$ 724,898	\$ 6,690	\$ (776,780)	\$ -	\$ -
20	\$ 41,038	\$ 6,661	\$ 3,619	\$ -	\$ 51,318	\$ 46,548	\$ 723,375	\$ 6,857	\$ (776,780)	\$ -	\$ -
TOTAL	\$ 628,865	\$ 102,066	\$ 55,460	\$ 220,962	\$ 1,007,353	\$ 934,260	\$ 14,496,065	\$ 105,281	\$ (15,535,606)	\$ -	\$ -

- NOTES:**
1. Financed Project Cost reflects the guaranteed fixed price of the scope executed under the Guaranteed Energy Savings Agreement, including the first year of measurement and verification of savings.
 2. Avoided Capital Savings includes the amortized annual cost of capital equipment replacement or repairs that would be realized by the Owner within the lifetime of the Energy Project, but will instead be completed and financed through the Energy Project. Savings include the total costs for all design, bidding, bonding, permitting, equipment and installation labor required to complete the work.
 3. Estimated payment from First Energy - MetEd Act 129 rebate programs based on information published by First Energy - MetEd and applied to this project. Rebates are not included in the cash flow.

3. Savings Calculation Methods

RES uses a combination of proprietary tools and powerful modeling software to project energy savings. Existing energy use is carefully analyzed and modeled to establish baseline conditions. The proposed changes are then added to the model to calculate savings. Cost savings are then calculated by applying models of actual rate tariffs to achieve the most accurate results possible. In order to minimize the risk of missed energy savings, RES will employ Option C of the International Performance Measurement and Verification Protocol (IPMVP) for the electric and gas usage at Upper Adams School District.

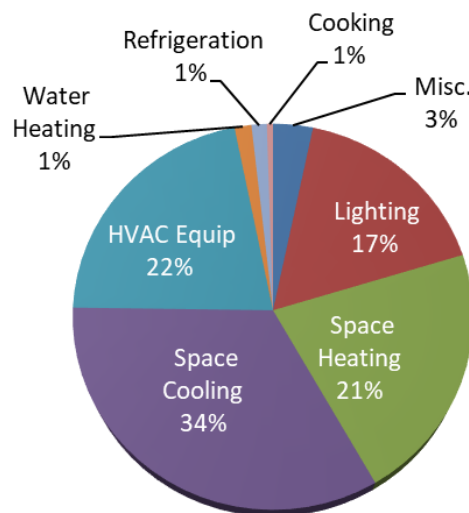
RES has experience using different building simulation programs for detailed energy analysis. RES utilized statistical data from a program called eQUEST, which is a powerful DOE-2-based program that has been developed over several years and is recognized as one of the leading analysis programs in the industry. As with any software, the input data and parameters must be carefully analyzed in order to produce accurate results.

As part of the IGA and GESA, energy and water/sewer savings are determined by engineering calculations and End Use analysis. Building simulation results, lighting line-by-line calculations, water usage modeling, and achieved energy savings results from similar FIMs were used to derive this initial savings estimates. A sample end-use analysis for the HS/MS is shown below.

HS/MS End Use Analysis (Utility Costs)

Misc.	\$ 7,192	3.3%
Lighting	\$ 36,883	17.0%
Space Heating	\$ 46,468	21.4%
Space Cooling	\$ 72,625	33.5%
HVAC Equip	\$ 46,827	21.6%
Water Heating	\$ 3,057	1.4%
Refrigeration	\$ 2,766	1.3%
Cooking	\$ 1,106	0.5%

TOTAL \$ 216,925



We believe in setting realistic goals for energy savings. While these goals are typically exceeded in actual execution, we start with achievable goals and then move to higher levels of achievement once we have succeeded in reaching the short-term goals. Rather than use a broad-based approach of setting an overall energy reduction goal, the energy use is separated into specific categories and then measures are targeted within the categories and realistic savings estimates are applied to these measures. The overall savings target for the project is the aggregate of the individual building FIMs.

The final step is to take interactive effects into consideration. Once you have reduced energy consumption in a specific sector you must reduce the “base” energy use for that sector prior to applying the next efficiency measure so that cumulative savings are not overstated. Regarding operational cost savings estimates, RES continues to be realistic and conservative in developing a project. With any new system replacement, the newly installed systems will eventually require maintenance and repairs that will offset any initial savings. In some cases the installed equipment, such as new controls systems, are likely to require more maintenance than the previous systems.

A realistic approach would be to start with a reasonable savings in year one and decrease that number over the life of the project to zero.

TABLE: Operational and Maintenance Savings


EEM	NATURE OF COSTS AVOIDED OR SAVINGS GENERATED	ANNUAL SAVINGS
		\$
1 Lighting System Improvements	Equipment not replaced during warranty period; extended lamp life	\$ 3,600
2 Arhitectural and Code Improvements	Equipment not replaced/repared during warranty period	\$ 600
3 HVAC and DDC System Improvements	Net maintenance impact of adding new equipment, replacing old equipment	\$ 2,800
4 Electrical System Improvements	Net maintenance impact of adding new equipment, replacing old equipment	\$ 300
5 Plumbing and Water Conservation	Equipment not replaced/repared during warranty period	\$ 900
6 Existing Building Cx Program	Equipment not replaced/repared during warranty period	\$ 6,500
TOTAL		\$ 14,700

4. Preliminary business case for identified FIMs

It was our goal to present all the financial and budget implications data associated with any of the decisions you will make regarding potential Elementary Consolidation. When considering a major building program – it is critical that the Upper Adams project stakeholders make informed decisions that include financial data on existing facility needs and do not merely isolate the budget implications associated with new construction. It is our belief the information we have provided in section 5.7.1 of the proposal and the corresponding EDOS makes the ‘business case’ for each of the options you are currently considering and two new Reynolds Alternate Elementary Program options.

5. Overall Project Fee Per each “energy conservation project component”

This information is included in our project financial summary under 5.7.1. Each energy conservation project component is listed per school, itemized per section 4, and includes an overall project fee for each building. However, the overall ‘project fee’ is dependent upon which Elementary program option is selected. In our appendix, we have included cost estimates and project fees associated with each option. For example, if you select an option from the Reynolds EDOS that includes new construction or campus consolidation at the Biglerville ES campus – you would not include the costs associated with renovation and infrastructure upgrades at either Bendersville or Arendtsville Elementary School presented here in section 5.7.1. Likewise, if you selected an option that includes Bendersville consolidation at the Arendtsville Elementary School – you would take the overall costs presented in 5.7.1 for Arendtsville ES, Biglerville ES, and the Upper Adams HS/MS and add them to the EDOS cost estimates associated with the addition work at Arendtsville. You can use this methodology to determine a final project budget/fee for any of the options presented in the EDOS or Crabtree Rohrbaugh Feasibility



Study. It was our intent to present all the information ‘stand alone’ so that project stakeholders could make informed and sustainable building program decisions, while understanding the budget implication(s) associated with consolidation, renovation, and your existing deferred maintenance needs.