

Executive Summary

PPL Energy Services (PPL) has completed the Investment Grade Audit (IGA) for the City of Lock Haven. The purpose of the IGA was to determine methods for the City to position itself for the future by reducing its utility costs and improving the environment within the existing City Hall building. The audit consisted of an on site survey of all the utilities for City Hall, the Waste Water Treatment Plant (WWTP) and Ross Library.

During the survey, our team of engineers found opportunities to implement energy conservation measures in the areas of lighting, HVAC, and power quality improvement at the WWTP. These opportunities were analyzed using computer energy models, based on data gathered from the survey. Using current utility rates, implementation of the recommended package of energy conservation measures (ECM's) will save the City of Lock Haven \$27,099 in the first year after implementation. The total cost for implementation of these measures is \$472,438. The total cumulative savings for the 15-year period are \$526,293.

As a result of this effort, PPL has developed a program that saves the city energy, operational and capital costs, is partially funded from the energy, operational and capital avoidance savings, replaces aged equipment with higher efficiency, state-of-the-art equipment.

The main benefits for implementing this project include:

- Total program savings over fifteen years from reductions in energy and operational costs:
 - \$435,140 in energy savings
 - \$91,153 in operational savings
- High efficiency central air-conditioning system with a state of the art direct digital controls (DDC) system for City Hall.
- Improved environmental conditions within City Hall.
- Increased equipment reliability at the WWTP.
- No change orders (fixed price contract), unless directed by the owner
- Extended equipment life

A total of eight (8) energy conservation measures (ECM's) were evaluated. Of the ECM's studied, a total of seven (7) ECM's are recommended. The list of ECM's studied and recommended is presented in Table 1.

A financial summary or cash flow of the implementation of this project is summarized in Table 2.

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TABLE 1

The following is a list of recommended projects.

	ECM Description
M1	City Hall Air Conditioning
M2	City Hall Controls Upgrade
M4	Domestic Water Heater Conversion
L1	City Hall Lighting
L2	Library Lighting
L3	Waste Water Treatment Plant Lighting
W1	Waste Water Treatment Plant Power Quality

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The following is the proforma cash flow for the list of recommended ECM's in Table 1:

TABLE 2

**City of Lock Haven
Lock Haven, PA
Energy Saving Retrofits
Project Proforma Cash Flows
15 Year Lease Term**

Total Project Cost	472,438	
Less: Customer Equity	(90,000)	
Total Amount Financed	382,438	
First Year Energy Savings	22,198	3.50% Annual Increase
First year Operational Savings	4,901	3.00% Annual Increase
Total First Year Savings	27,099	

1	2	3	4	5	6	7	8	9
Year	Energy Savings	Operational Savings	Total Savings	Avoided Capital Outlays	Lease Payments	Fees	Net Savings	Accumulated Savings
const.	6,817		6,817				6,817	6,817
1	22,198	4,901	27,099	-	35,074	-	(7,975)	(1,158)
2	22,975	5,048	28,023	-	35,074	-	(7,051)	(8,210)
3	23,779	5,199	28,978	-	35,074	-	(6,096)	(14,305)
4	24,611	5,355	29,967	-	35,074	-	(5,107)	(19,413)
5	25,473	5,516	30,989	-	35,074	-	(4,085)	(23,498)
6	26,364	5,682	32,046	-	35,074	-	(3,028)	(26,527)
7	27,287	5,852	33,139	-	35,074	-	(1,935)	(28,462)
8	28,242	6,028	34,270	-	35,074	-	(805)	(29,266)
9	29,230	6,208	35,439	-	35,074	-	365	(28,902)
10	30,253	6,395	36,648	-	35,074	-	1,574	(27,328)
11	31,312	6,587	37,899	-	35,074	-	2,825	(24,503)
12	32,408	6,784	39,192	-	35,074	-	4,118	(20,385)
13	33,543	6,988	40,530	-	35,074	-	5,456	(14,929)
14	34,717	7,197	41,914	-	35,074	-	6,840	(8,089)
15	35,932	7,413	43,345	-	35,074	-	8,271	182
	435,140	91,153	526,293	-	526,112	-	182	

Notes by column:

- (1) Contract Year as defined in the Agreement.
- (2) Projected Energy Use Savings are escalated at 3.5% per year.
- (3) Projected Operational Savings are escalated at 3% per year
- (4) Columns (2) plus (3)
- (5) Capital Expenditures avoided by completing proposed Project.
- (6) Estimated payment to financing entity based on financing \$382,438 at 4.39% for a 15 year term.
- (7) Ongoing Fees for Measurement & Verification
- (8) Annual savings equals columns (4) plus (5) less (6) less (7)
- (9) Accumulated savings

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Program Summary:

The recommended Energy Services Project will provide many financial and operational benefits as detailed below.

Program Benefits:

- Improved lighting environment
- Energy cost reduction
- Operational cost reduction
- Capital cost avoidance
- Reduced downtime
- Improved comfort for building occupants
- Maintenance savings
- Increased equipment life
- Increased productivity
- Improved air quality (IAQ)
- Reduced breakdowns and repairs
- Guaranteed energy savings

Based on these benefits and the goals of the City of Lock Haven, PPL Energy Services recommends implementation of this project.