Bloomfield Township TEA Executive Summary

Building	Dollars			Square Footage	$/ Sq. FT.	K BTU/ SQ. FT.		Savings					
	Electric	Natural Gas	Total			EUI	Benchmark EUI	Potential Low Side Savings	High Side Installed Costs	Years ROI	% Savings	High Side Savings	# Proposed Projects
Animal Shelter	$ 2,135	$ 7,803	$ 9,938	4,200	2.11	202.7	77	$ 2,150	$ 6,610	4.8	24.1%	5,141	13
Cable	$ 15,644	$ 3,425	$ 19,069	4,300	4.43	221.9	104-130 no nat. avg. set	$ 5,315	$ 11,910	2.2	27.9%	10,130	17
DPS	$ 87,456	$ 32,015	$ 119,471	77,757	1.53	75.1	74.8	$ 15,460	$ 27,700	1.8	12.9%	44,350	18
DPS Annex	$ 21,383	$ 5,235	$ 26,618	11,586	2.30	100.4	79	$ 3,615	$ 4,000	1.11	13.6%	8,040	10
Fire Central	$ 22,801	$ 9,308	$ 32,109	17,095	1.88	100.4	107.4	$ 5,210	$ 6,365	1.2	16.2%	11,457	12
Fire #2	$ 5,894	$ 4,024	$ 9,919	4,410	2.25	135.3	77	$ 1,875	$ 7,160	3.8	18.9%	4,510	11
Fire #3	$ 6,756	$ 3,264	$ 10,020	4,952	2.02	108	77	$ 2,025	$ 6,060		20.2%	4,630	12
Fire #4	$ 7,299	$ 5,625	$ 12,924	5,042	2.56	155.7	103	$ 2,935	$ 10,160	3.5	22.7%	6,450	13
Judical Courthouse	$ 61,481	$ 19,000	$ 80,481	33,489	2.40	115	89	$ 22,230	$ 57,600	2.6	27.6%	44,956	17
Senior Center (with theraputic pool)	$ 46,513	$ 27,722	$ 74,235	24,237	3.06	**178.5**	150-290 no nat. avg. est.	$ 29,720	$ 35,975	1.2	40.0%	49,484	**20**
Township Hall (nat. avg. for complexes with jails and offices not set)	$ 41,900	$ 24,550	$ 66,450	25,510	2.60	144.9 n/a	80-140 ranges	$ 21,748	$ 105,260	4.8	32.7%	40,766	21
Total All Buildings	**$ 319,262**	**$ 141,971**	**$ 461,233**	212,578	**2.17**	**139.30**		**$ 112,283**	$ 278,800	2.48	24.3%	229,914	164
									High side savings			49.8%	

Appendix A

Priority Listing of Energy Projects
Bloomfield Township

1 = 0-2 year ROI 2 = 2.1-5 years ROI 3 = 5.1 - 10 years ROI 4 = 10.1+ years ROI 5 = other justification	Utility Rebate for this project	Animal Shelter	Cable Building	Central Fire	#2 Fire Station	#3 Fire Station	#4 Fire Station	District Court	PS Building	PS Annex	Town-ship Hall	Senior Center
Employee Training		1	1	1	1	1	1	1	1	1	1	1
Purchase Natural Gas from Broker		1	1	1	1	1	1	1	1	1	1	1
Purchase Electricity from Broker		1	1	1	1	1	1	1	1	1	1	1
Track Energy Use on Monthly Basis		1	1	1	1	1	1	1	1	1	1	1
Utility Rebates Available for building		1	1	1	1	1	1	1	1	1	1	1
Energy Star Products Purchases	Yes	1	1	1	1	1	1	1				1
Vending Timers	Yes							1			1	1
Drinking Fountain Timers	Yes	1		1				1				1
Replace T 12 with T 8	yes	X				X	3	X			4	
Occupancy Sensors	Yes	3	4	3	3	3	3	4	2 or 3	2 or 3	4	3 or 4
Occupancy Sensors per building		10	10	11	8	10	13	26	6	3	28	25
Exit Lights	Yes	2 or 3	2 or 3		2 or 3	2 or 3	2 or 3	2 or 3			2 or 3	
Exit lights per building		5	3		3	3	3	12			12	
Exterior Light Timers		3										
Replace Parking Lot Lights	yes		3			3	3					
Trim Trees Around Parking Lot Lights			5									
EMS Tune Up				2					1	1		2
Thermostats	Yes	1	1		2	1	1	1				
Control Systems Replaced											2	
Air Balance											3	
Heating Set Point Changes		1	1	1					1		1	1

APPENDIX B

Priority Listing of Energy Projects
Bloomfield Township

1 = 0-2 year ROI 2 = 2.1-5 years ROI 3 = 5.1 - 10 years ROI 4 = 10.1+ years ROI 5 = other justification	Utility Rebate for this project	Animal Shelter	Cable Building	Central Fire	#2 Fire Station	#3 Fire Station	#4 Fire Station	District Court	PS Building	PS Annex	Town-ship Hall	Senior Center
Cooling Set Point Changes				1					1		1	1
Replace Hot Water Heater	Yes	4	3		4							
Reduce Hot Water Use	Yes	3	3	3	3	3	3	3			2	
Turn off Hot Water Heater									3	1		
Replace Pool Water Heater	Yes											3
Replace RTU	Yes							3			3	
CO 2 Controls			3									
Air Balance											3	
Tune Up Boilers	Yes										2	
Replace Boiler	Yes							3			3	
Humidity Control Replacement											2	
High Efficiency Motors	Yes		1					1			1	
Cog Belts	Yes		4					1			1	
Replace Toilets						5	5	5			5	
Install Blinds												3
Pool Water Temp. Decrease												1
Pool Cover	Yes											1
Natatorium humidity increase												1
Air Curtain on Door									3			
Reduce Static Pressure									1			
Vestibule												
Purchase electricity on off peak hours									1			
Building Total # of Projects		13	17	12	11	12	13	17	18	10	22	16

Bloomfield Township Hall Potential Project Listing

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
		HVAC							
1	Use high efficiency motors for all replacements and specify for all new units	High efficiency motors run 1-3.6% more efficient than conventional and older units. The savings is not large enough to justify replacing motors in operation, but replacement of worn out units and new equipment should be specified. There is a premium for Energy Efficient Motors.	90	180	125	125	8,760	electric	1.4
2	Use cog belts in motors driving belts to the load.	It appears most belts in inventory are cog belts. A 1-3% savings can be achieved on drive systems by using cog belts versus standard v belts.	600	1800	600	1,000	8760.0	electric	1.7
3	Replace Trane Roof Top HVAC units	Trane, 1987 unit, 7 ton, 80,000 btu/hr unit needs replaced. The roof top units can be replaced with higher efficiency SEER unit. This will save 10-30% of energy consumed on cooling side and 5-10% on heating side.	1,150	1,700	7,800	9,800	3,000	natural Gas	8.5
4	Air balance	Facility air balance is out of good operating ranges, excess energy is used in fan horsepower and cooling and heating costs.	1,800	2,600	8,000	11,000	8,760	both electric and natural gas	6.1
5	Install EMS for this building	Install EMS used on newer 4 buildings installed by METRO.	7,800	9,900	85,000	110,000	8,760	both electric and natural gas	14.1

APPENDIX A

Bloomfield Township Hall Potential Project Listing

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
6	Replace Trane controls	Trane HVAC building controls are worn out and need replaced, set back controls, air flows, etc. not working at best efficiency.	2,900	4,000	9,000	12,000	8,760	both electric and natural gas	4.1
7	Replace Boiler in basement with new high efficiency units	Existing boilers were at best 60-70%. Present unit is worn out. New technology boilers run 88-93% efficiency. The unit will be difficult to get high efficiency exhaust out, but savings will be worth it.	1,350	1,800	9,200	12,500	5,000	natural Gas	9.3
8	Replace roof penthouse boiler	Existing boiler is 60-75% efficient. Newer units run at 88-93% efficiency. Old unit is at the end of it's life and will need to be replaced sooner than later. 840,000 BTU/hr unit may be able to be sized lower, with all the conservation projects implemented.	1,800	2,500	12,000	16,500	5,000	natural Gas	9.2
9	Humidity Control	Replace boiler providing humidity control to the facility with a DE-correlation technology type unit. Typical savings are from 50-70% savings. Bryan boiler heat input is 250,000 btu/hr, which costs $60/day to operate. The replacement unit will cost $24/day to operate or 60% savings.	1,350	2,600	3,800	5,900	5,000	natural Gas	4.4
10	Replace humidity control boiler	Replace boiler with high efficiency unit. The savings are small compared to using air unit in project above. Old unit is at 50-65% efficiency versus new units at 88%.	860	1,100	6,000	8,000	5,000	natural Gas	9.3

APPENDIX A

Bloomfield Township Hall Potential Project Listing

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
11	Replace lower efficiency model Roof top units	Present units range in efficiency of 79-82% design efficiency, most of which run 5-10% below design specifications today. They are older and can be replaced with 82-83% units. Air cooling side are 10 SEER, which can be replaced with 13-16 SEER. Savings cannot support replacing units that are operating, but when replacement is required, install the higher efficiency units.	850.00	1,800.00	6,000	8,000	3,000	electric	9.4
12	Install new burners on the boilers	If the boilers are not replaced, new burner could be installed to obtain 5-10% efficiency gain. New units use electronic controls versus mechanical linkages. Would suggest to replace boilers.	550	750	3,000	4,000	5,000	both electric and natural gas	7.3
13	Tune up boilers	Once boilers are cleaned and inspected on an annual basis, perform a tune up of the units. On the older style mechanical linkage type boiler, efficiency losses can be 5-8% from year to year.	600	1,200	1,500	2,500	5,000	both electric and natural gas	4.2
14	Steam Absorption Chillers	Replace the existing chiller with steam absorption chillers, not the best option without waste heat source.	0	0		0	8760	both electric and natural gas	n/a

APPENDIX A

Bloomfield Township Hall Potential Project Listing

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
		HOT WATER PROJECTS							
15	Reduce hot water use	Install devices in bathroom and other faucets to reduce the use of hot water. A 10-20% reduction should be realized.	90	180	150	400	8760	natural gas	4.4
		LIGHTING							
16	Occupancy sensors in 28 rooms	Install occupancy sensors in 28 rooms throughout the building to turn on and off the lights as rooms are occupied. Savings of 20-60% will be saved.	710	2,130	5,600	8,400	3,000	electric	11.8
17	Replace buildings remaining T 12 fixtures and ballasts with T 8	Replace T12 bulbs with more efficient bulbs requiring 11-15.25 watts less per bulb for 480-520 efficiency, depending on which are replaced.	1,800	2,600	13,400	21,000	3000.0	electric	11.7
18	Replace exit lights with LED units	The existing exit signs use 20-50 watts per unit more than a new LED unit will. 10 signs will be replaced.	208	540	900	1,600	8,760	electric	7.7
		MISCELLANEOUS							
19	Drinking Fountain Timer	The drinking fountain cools water 24 hours a day, 365 days a year, which is not needed. Install a timer, which will allow the unit to run during business hours only.	30	36	20	35			1.2
20	Replace Toilets with low water use units.	The present units use 3.6 gallons per flush, versus 1.6 gpf for new style units. A savings of 55%.	Water Savings	Water Savings					

APPENDIX A

Bloomfield Township Hall Potential Project Listing

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
21	Vending Machines	Minimize energy use of vending machines and install device which will cut back consumption during schedule off periods. Reduce lighting in units. Have vendors place high efficiency units. Two vending machines can utilize a control device to obtain these savings.	420	700	600	800	8,760	electric	1.9
22	Kitchen appliances are Energy Star Product, make sure all replacements in the future are ES.	The kitchen appliances are Energy Star. Future replacements should be up-to-date Energy Star products.	will depend on what is replaced		will depend		8,760	both	n/a
23	Employee Training	Staff should be trained on the importance of energy costs and uses; this will translate to savings year round.	300	900	150	500	8760	both	1.7
24	Purchase Natural Gas from another source	Bundle up all the buildings on the campus and purchase natural gas from a broker, which can provide for 10-30% less than the utility rates.	2,200	6,600	0	500	8,760	costs natural gas	0.2
25	Purchase electricity from another source than DTE	When available, a replacement for DTE electricity should be pursued, as much as 1-2 cents per kwhr can be realized.	4,100	8,200	0	500	8,760	costs electric	0.1

Bloomfield Township Hall Potential Project Listing

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
26	Track Energy Use on Monthly Basis	Inform employees of use and track versus other buildings for comparison purposes. More detailed tracking can be accomplished with daily meter reading, which is not part of this project.	250	500	100	200	8760.0	both	0.8
27	Utility rebates	Several of the projects listed will be eligible for rebate incentives from Detroit Edison and natural gas utility.	energy savings included above		will depend		8,760	both	n/a
Total all Projects			31,808	54,316	172,945	235,260			7.4
Total Proposed Projects (Either #5 or #6 can be implemented, the higher ROI project was cut)			21,748	40,766	72,945	105,260			4.8
Total all Proposed Projects (highlighted									
Low Side of Savings and Cost to Implement			**21,748**		72,945				
High Side of Savings and Cost to Implement				40,766		105,260			
	Annual Energy Costs		% Savings		ROI Years				
	Electric	41,900.00							
	Natural Gas	24,550.00							
	Total	66,450.00							
	Low Side Savings	21,748	33%		3.35				
	High Side Savings	40,766	61%		2.58				

APPENDIX A

Bloomfield Township Cable Building Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
		HVAC							
1	Use high efficiency motors for all replacements and specify same for all new units	High efficiency motors run 1-3.6% more efficiently than conventional and older units. The savings is not large enough to justify replacing motors in operation, but replacement of worn out units and new equipment should be specified. There is a premium for Energy Efficient Motors.	90	180	125	125	8,760	electric	1.4
2	Use cog belts in motors driving belts to the load	It appears most belts in inventory are cog belts, but not all belts, 1-3% savings can be achieved on drive systems by using cog belts versus standard v belts.	60	180	600	1,000	8760.0	electric	16.7
3	Replace Roof Top HVAC units	The roof top units can be replaced with higher efficiency SEER units. This will save 10-30% of energy consumed on the cooling side and 5-10% on the heating side.	1,400	4,200	9,000	16,000	8,760	both electric and natural gas	11.4
4	Use CO2 Controls in Studio	Studio HVAC unit has a variable frequency drive on it already, install CO2 controls to adjust outside air makeup.	400	600	2,500	3,000	8,760	both electric and natural gas	7.5
5	Install EMS for this building independent of Metro system	Install EMS used on newer 4 buildings installed by METRO.	2,700	4,050	10,000	12,400	8,760	both electric and natural gas	4.6

APPENDIX A

Bloomfield Township Cable Building Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
6	Install tamper- proof setback thermostats	Thermostats are allowed to be controlled by anyone that pleases to make a change. A prescribed set point will be established and the unit will be run at scheduled times. If the EMS system is installed, this will be included in that system.	1,800	2,700	800	1,200	8760	both electric and natural gas	0.7
7	Thermostat set point to high 80 degrees in Sally Port	During the audit the set point for heating was set at 80 degrees F. This room was hot and wasting energy. Lower to 68-72 degrees F.	50	200	0	25	5,050	natural Gas	0.5
		HOT WATER PROJECTS							
8	Replace Hot Water Heater	Install newer more efficient natural gas hot water heating system, replace electrical unit. Use one of the heaters that will be shut off in another township building.	200	250	500	1,500	8760	natural gas	7.5
9	Reduce hot water use	Install devices in bathroom and other faucets to reduce the use of hot water. A 10-20% reduction should be realized.	20	40	100	200	8760	natural gas	10
		LIGHTING							
10	Replace existing T12 bulbs with more efficient T8 bulbs	Replace T12 bulbs with more efficient T8 bulbs and ballasts requiring 11-15.5 watts less per bulb on average. Only a couple exist in the mechanical room, which is seldom used. Savings will be minor.	10	25	120	160	2600	electric	16
11	Replace Parking Lot Lights	Replace parking lot 250 watt fixtures with induction fixtures that will use 120 watts each.	120	150	650	800	4,400	electric	6.7

APPENDIX A

Bloomfield Township Cable Building Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
12	Trim trees around parking lot lights	Light is being blocked by the trees more so in the summer by the leaves. Trim the trees to let more of the light get to the areas it can be used.	improved use						n/a
13	Install occupancy sensors in 10 rooms	Install occupancy sensors in 10 rooms throughout the building to turn on and off the lights as rooms are occupied. Savings of 20-60% will be saved.	220	440	1,600	2,200	5,100	electric	10
14	Replace exit lights with LED units	The existing exit signs use 20-50 watts per unit more than a new LED unit will.	55	140	270	360			6.5
		MISCELLANEOUS							
15	Kitchen appliances are Energy Star Product, make sure all replacements in the future are ES	The kitchen appliances are Energy Star. Future replacements should be up-to-date Energy Star products.	will depend on what is replaced		will depend		8,760	both	n/a
16	Employee Training	Staff should be trained on the importance of energy costs and uses; this will translate to savings year round.	350	900	150	300	8760	both	0.9
17	Purchase Natural Gas from another source	Bundle up all the buildings on the campus and purchase natural gas from a broker, which can provide for 10-30% less than the utility rates.	350	1,050	0	500	8,760	costs natural gas	1.4
18	Purchase electricity from another source than DTE	When available, a replacement for DTE electricity should be pursued, as much as 1-2 cents per kwhr can be realized.	1,500	3,000	0	500	8,760	costs electric	0.3

APPENDIX A

Bloomfield Township Cable Building Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
19	Track Energy Use on Monthly Basis	Inform employees of use and track versus other buildings for comparison purposes. More detailed tracking can be accomplished with daily meter reading, which is not part of this project.	100	300	100	200	8760.0	both	2.0
20	Utility rebates	Several of the projects listed will be eligible for rebate incentives from Detroit Edison and natural gas utility.	energy savings included above		will depend		8,760	both	n/a
Total all Projects			9,325	18,105	26,415	40,270			4.3
Total Proposed Projects (Either #5 or #6 can be implemented, the higher ROI project was cut)			5,315	10,130	7,395	11,910			2.2
Total all Proposed Projects (highlighted									
Low Side of Savings and cost to implement			**5,315**		**7,395**				
High Side of Savings and Cost to Implement				10,130		11,910			
	Annual Energy Costs		% Savings		ROI Years				
	Electric	15,644.00							
	Natural Gas	3,425.00							
	Total	19,069.00							
	Low Side Savings	5,315	28%		1.39				
	High Side Savings	10,130	53%		1.18				

APPENDIX A

Bloomfield Township District Court Potential Project Listing

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
		HVAC							
1	Use high efficiency motors for all replacements and specify for all new units	High efficiency motors run 1-3.6% more efficient than conventional and older units. The savings is not large enough to justify replacing motors in operation, but replacement of worn out units and new equipment should be specified. There is a premium for Energy Efficient Motors.	90	180	125	125	8,760	electric	1.4
2	Use cog belts in motors driving belts to the load	It appears most belts in inventory are cog belts, but not all belts. A 1-3% savings can be achieved on drive systems using cog belts versus standard v belts.	600	1800	600	1,000	8760.0	electric	1.7
3	Replace Roof Top HVAC units	The roof top units can be replaced with higher efficiency SEER units. This will save 10-30% of energy consumed on the cooling side and 5-10% on the heating side.	1,650	4,200	9,000	16,000	3,000	natural Gas	9.7
4	Replace Bryan boilers	Bryan boilers, 1988 run at 60-75% efficiency, replace with 90+% units.	3,150	4,500	17,000	25,000	3,000	natural Gas	7.9
5	Replace Lochnivar boilers	Two Lochnivar boilers are 84% efficient, 300,000 Btu/hr input. Install 90+% efficient boilers	540	900	8,000	11,000	8,760	both electric and natural gas	20.37
6	Install EMS for this building independent of Metro system	Install EMS used on newer four buildings installed by METRO	9,500	11,700	60,000	78,000	8,760	both electric and natural gas	8.2

APPENDIX A

Bloomfield Township District Court Potential Project Listing

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
7	Install tamper proof, password protected setback thermostats	Thermostats are allowed to be controlled by anyone that pleases to make a change. A prescribed set point will be established and the unit will be run at scheduled times. If the EMS system is installed, this will be included in that system. Ten different zones will have to be modified.	7,000	14,000	2,500	3,500	8760	both electric and natural gas	0.5
8	Install vestibule on Northeast entry that works	Vestibule doesn't close when wind blows, allowing extreme hot and cold air to sweep through offices, etc.	600	1,000	3,000	9,000	5,050	natural Gas	15.0
		HOT WATER PROJECTS							
9	Replace Hot Water Heater	Install newer more efficient natural gas hot water heating system, replace electrical unit. Use one of the heaters that will be shut off in another township building.	75	100	500	1,500	8760	natural gas	20
10	Reduce hot water use	Install devices in bathroom and other faucets to reduce the use of hot water. A 10-20% reduction should be realized.	30	60	100	200	8760	natural gas	6.7
		LIGHTING							
11	Install occupancy sensors in 26 rooms	Install occupancy sensors in 26 rooms throughout the building to turn on and off the lights as rooms are occupied. Savings of 20-60% will be saved.	640	1,920	5,200	7,800	3,000	electric	12.2
12	Replace exit lights with LED units	The existing exit signs use 20-50 watts per unit more than a new LED unit will. 12 signs will be replaced	220	560	1,080	1,440	8,760	electric	6.5

APPENDIX A

Bloomfield Township District Court Potential Project Listing

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
		MISCELLANEOUS							
13	Install Drinking Fountain Timer	The drinking fountain cools water 24 hours a day, 365 days a year, which is not needed. Install a timer, which will allow the unit to run during business hours only.	30	36	20	35			1.2
14	Replace Toilets with low water use units	The present units use 3.6 gallons per flush, versus 1.6 gpf for new style units. A savings of 55%.	Water Savings	Water Savings					
15	Vending Machines	Minimize energy use of vending machines, install device which will cut back consumption during schedule off periods. Reduce lighting in units. Have vendors place high efficiency units. Two vending machines can utilize a control device to obtain these savings.	420	700	600	800	8,760	electric	1.9
16	Kitchen appliances are Energy Star Product, make sure all replacements in the future are ES	The kitchen appliances are Energy Star. Future replacements should be up to date Energy Star products.	will depend on what is replaced		will depend		8,760	both	n/a
17	Employee Training	Staff should be trained on the importance of energy costs and uses; this will translate to savings year round.	350	900	150	500	8760	both	1.4
18	Purchase Natural Gas from another source	Bundle up all the buildings on the campus and purchase natural gas from a broker, which can provide for 10-30% less than the utility rates.	1,700	3,400	0	500	8,760	costs natural gas	0.3

APPENDIX A

Bloomfield Township District Court Potential Project Listing

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
19	Purchase electricity from another source than DTE	When available, a replacement for DTE electricity should be pursued, as much as 1-2 cents per kwhr can be realized.	6,100	12,200	0	500	8,760	costs electric	0.1
20	Track Energy Use on Monthly Basis	Inform employees of use and track versus other buildings for comparison purposes. More detailed tracking can be accomplished with daily meter reading, which is not part of this project.	250	500	100	200	8760.0	both	0.8
21	Utility rebates	Several of the projects listed will be eligible for rebate incentives from Detroit Edison and natural gas utility.	energy savings included above		will depend		8,760	both	n/a
Total all Projects			32,945	58,656	107,975	157,100			4.8
Total Proposed Projects (Either #5 or #6 can be implemented, the higher ROI project was cut)			22,230	44,956	36,475	57,600			2.6
Total all Proposed Projects (highlighted in									
Low Side of Savings and Cost to Implement			**22,230**		**36,475**				
High Side of Savings and Cost to Implement				44,956		57,600			
	Annual Energy Costs		% Savings		ROI Years				
	Electric	61,481.00							
	Natural Gas	19,000.00							
	Total	80,481.00							
	Low Side Savings	22,230	28%		1.64				
	High Side Savings	44,956	56%		1.28				

APPENDIX A

Bloomfield Township Animal Shelter Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
		HVAC							
1	Install EMS for this building independent of Metro system	Install EMS used on newer 4 buildings installed by METRO	1,250	1,600	5,500	6,500	8,760	both electric and natural gas	5.2
2	Install tamper proof set back thermostats	Thermostats are allowed to be controlled by anyone that pleases to make a change. A prescribed set point will be established and the unit will be run at scheduled times. If the EMS system is installed, this will be included in that system.	700	1,400	600	1,200	8760	both electric and natural gas	1.7
3	Thermostat set point to high 68-72 Offices, lower in animal cage room in heating season	During the audit, the set point for heating was set at 75 degrees F. The offices should be 68-72 and the remainder will be set at 66-70.	300	450	0	25	5,050	natural Gas	0.1
		HOT WATER PROJECTS							
4	Replace Hot Water Heater	Install newer more efficient natural gas hot water heating system, replace electrical unit. Use one of the heaters that will be shut off in another township building.	70	105	100	1,500	8760	natural gas	21.4
5	Reduce hot water use	Install devices in bathroom and other faucets to reduce the use of hot water. A 5-10% reduction should be realized. Since large volumes of water are used on cleaning animals, reduction will be less than a normal building.	35	70	100	200	8760	natural gas	5.7

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Bloomfield Township Animal Shelter Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
		LIGHTING							
6	Replace existing T12 bulbs with more efficient T8 bulbs	Replace T12 bulbs with more efficient T8 bulbs and ballasts requiring 11-15.5 watts less per bulb on average. Only a couple exist in the mechanical room, which is seldom used. There are 60, 4' and 12 , 8' bulbs that should be replaced.	220	280	2,500	3,200	2600	electric	14.5
7	Exterior Building lighting timers	Exterior building lights are left on during the day and should be shut off with an automatic timer.	60	100	200	500	5,840	electric	8.3
8	Occupancy sensors in 10 rooms	Install occupancy sensors in 10 rooms throughout the building to turn on and off the lights as rooms are occupied. Savings of 20-60% will be saved.	110	220	770	1,200	5,100	electric	10.9
9	Replace exit lights with LED units	Replace the existing exit signs that use 20-50 watts per unit with a new LED unit. (5)	90	230	450	600	8,760	electric	6.7
		MISCELLANEOUS							#DIV/0!
10	Drinking Fountain Timer	The drinking fountain cools water 24 hours a day, 365 days a year, which is not needed. Install a timer, which will allow the unit to run during business hours only.	30	36	20	35			1.2
11	Kitchen appliances are Energy Star Product, make sure all replacements in the future are ES	The kitchen appliances are Energy Star. Future replacements should be up-to-date Energy Star products. Large freezer used for food storage should be looked at first.	will depend on what is replaced		will depend		8,760	both	n/a

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Bloomfield Township Animal Shelter Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
12	Employee Training	Staff should be trained on the importance of energy costs and uses; this will translate to savings year .	40	80	50	150	8760	both	3.8
13	Purchase Natural Gas from another source	Bundle up all the buildings on the campus and purchase natural gas from a broker, which can provide for 10-30% less than the utility rates.	700	2,100	0	500	8,760	costs natural gas	0.7
14	Purchase electricity from another source other than DTE	When available a replacement for DTE electricity should be pursued, as much as 1-2 cents per kwhr can be realized	100	300	0	500	8,760	costs electric	5.0
15	**Track Energy Use on Monthly Basis**	Inform employees of use and track versus other buildings for comparison purposes. More detailed tracking can be accomplished with daily meter reading, which is not part of this project.	25	50	100	200	8760.0	both	8.0
16	Utility rebates	Several of the projects listed will be eligible for rebate incentives from Detroit Edison and natural gas utility.	Will depend on projects installed		will depend		8,760	both	n/a

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Bloomfield Township Animal Shelter Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
Total all Projects			3,705	6,971	10,390	16,110			4.3
Total Proposed Projects (Either #1 or #2 can be implemented, the higher ROI project was cut)			2,150	5,141	2,390	6,610			3.1
Total all Proposed Projects (highlighted in									
Low Side of Savings and Cost to Implement			**2,150**		2,390				
High Side of Savings and Cost to Implement				5,141		6,610			
	Annual Energy Costs		% Savings		ROI Years				
	Electric	2,135.00							
	Natural Gas	7,803.00							
	Total	9,938.00							
	Low Side Savings	2,150	22%		1.11				
	High Side Savings	5,141	52%		1.29				

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Bloomfield Township Public Services Building Project Priority List

Project #	PROJECT NAME	PROJECT DESCRIPTION	Low Side Savings	High Side Savings	Low Side Capital	High Side Capital	Hours per year	Type of energy savings	ROI in years
	HVAC								
1	Tune up EMS systems	EMS system was set up using building design specifications and has not be fined tuned for all cases.	1,000	4,000	1,000	1,500	8,760	both electric and natural gas	1.5
2	Install Automatic air curtains on large garage doors	Install air curtains on the door entrances which will reduce heated air losses in the winter.	800	1,200	2,000	4,500	5,200	both electric and natural gas	5.6
3	Exterior doors open during heating periods	Exterior doors of the building are open at times when the heating system is operating. This has been discussed with personnel, but is still an issue.	500	3,000	0	3,000	5,200	natural gas	6.0
4	Reduce static air pressure for building	CO2 levels are low many times of the day and will allow lower static pressures and outside air flows.	0	3,000	500	2,000	8,760	both electric and natural gas	0.0
5	Heating Thermostat Set Points, lowered	Operate temperatures in offices at 68-71 degrees F and garages, basements etc. at 65-68 degrees F. Several temperatures ranged several degrees above these levels.	0	2,000	0	1,000	5,200	both electric and natural gas	0.0
6	Air Conditioning Thermostat Set Points, raised	Operate Air Conditioning set points in offices at 74-76; garage no A/C; basement 74-76. Several points ranged lower during the audits.	0	2,000	0	1,500	3,600	both electric and natural gas	0.0

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Bloomfield Township Public Services Building Project Priority List

	HOT WATER PROJECTS								
7	Shut off one of #304 water heaters	There are two 65 gallon water heaters that serve the kitchen and two bathrooms. Shut one off and save the standby energy for it., 680 btu/hr.	70	90	0	0	8,760	natural gas	0.0
8	Shut off one of the locker room water heaters	There are two 100 gallon water heaters that serve the kitchen and two bathrooms. Shut one off and save the standby energy for it., 1040 btu/hr.	90	110	0	0	8,760	natural gas	0.0
	LIGHTING PROJECTS								
9	Install automatic light controls in the DPW garage	Garage has skylights and windows in doors, which allow light into the building during daylight hours. All the lights where on 5 out of 6 audits. Sensors can turn back a portion of the light.	600	800	2,500	4,000	5,100	electric	6.7
10	Water storage parts room - Install automatic light sensors	Storage room has infrequent use, but lights are left on over 80% of the time. Installation of light sensors will turn on the lights as needed and turn off after use.	500	700	1,000	1,500	2,600	electric	3.0
11	Parts storage room - Install automatic lighting sensors	Install sensors that will adjust lighting levels lower as needed, shut off when none in room, put two sensors by desks and second by shelves.	400	600	500	1,000	5,100	electric	2.5

Bloomfield Township Public Services Building Project Priority List

12	Mechanical room on mezzanine - Install automatic lighting sensors	Install sensors that will turn lights on and off in mechanical room level lights.	200	300	300	500	5,200	electric	2.5
13	Purchase electricity during off-peak morning hours prior to normal business hours	Cool the building in the morning hours, prior to the normal business office start time and prior to the on-peak demand starts. This will allow the purchase of cheaper electricity. EMS allows some of this now, ensure this is optimized.	0	1,500	0	1,000	600	electric	n/a
	MISCELLEANOUS PROJECTS								
14	Install Vestibule East Office Door	Highest use is the main door which does not have a windbreak or vestibule door. Installation of door inside the hallway will reduce heat and air conditioning losses significantly.	750	1,000	2,000	8,000	8,760	both electric and natural gas	10.7
15	Vending Machines	Minimize energy use of vending machines by installing a device which will cut back consumption during schedule off periods. Reduce lighting in units. Have vendors place high efficiency units. Three vending machines can utilize a control device to obtain these savings.	800	1,050	900	1,200	8,760	electric	1.5
16	Kitchen appliances are Energy Star Product, make sure all replacements in the future are ES.	The kitchen appliances are Energy Star. Future replacements should be up to date Energy Star products.	Will depend on what is replaced		0	0		both electric and natural gas	

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Bloomfield Township Public Services Building Project Priority List

17	Employee Training	Staff should be trained on the importance of energy costs and uses; this will translate to savings year round.	1,000	3,000	500	1,500	8,760	both electric and natural gas	1.5
18	Purchase Natural Gas from another source	Bundle up all the buildings on the campus and purchase natural gas from a broker, which can provide for 10-30% less than the utility rates.	2,000	6,000	500	1,500			0.8
19	Purchase electricity from another source than DTE	When available, a replacement for DTE electricity should be pursued, as much as 1-2 cents per kwhr can be realized.	7,500	15,000	700	2,000		not energy consumptio n., but purchase cost	0.3
20	Utility rebates	Several of the projects listed will be eligible for rebate incentives from Detroit Edison and natural gas utility.	Will depend on what is installed		Costs of projects 9, 10, 11, 16		8,760	both electric and natural gas	n/a
Total all Projects			16,210	45,350	12,400	35,700	17,520		
Total Proposed Projects (All projects are proposed)			15,460	44,350	10,400	27,700	17,520		
Low Side of Savings and Cost to Implement			**15,460**		**12,400**				**0.80**
High Side of Savings and Cost to Implement				**44,350**		**27,700**			**0.62**
	Annual Energy Costs		**% Savings**		**ROI Years**				
	Electric	**87,456**							
	Natural Gas	**32,015.88**							
	Total	**119,471.42**							
	Low Side Savings	**15,460**	**13%**		**3.33**				
	High Side Savings	**44,350**	**37%**		**2.35**				

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Bloomfield Township DPS Annex Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
		HVAC							
1	Tune up EMS systems	EMS system was set up using building design specifications and has not be fined tuned for all cases.	800	1,700	200	800	8,760	both	1.0
		HOT WATER PROJECTS							
2	Shut off one of the locker room water heaters	There are two 100 gallon water heaters that serve the kitchen and two bathrooms. Shut one off and save the standby energy for it., 1040 btu/hr.	90	110	0	50	8,760	natural gas	0.6
		LIGHTING							
3	Install occupancy sensors in Large East Garage	Install occupancy sensors in large maintenance garage to turn on and off the lights as rooms are occupied. Savings of 20-60% will be saved. 96 lights installed, 1/2 off normally.	110	260	600	800	2,600	electric	7.3
4	Install occupancy sensors in Middle garage	Install occupancy sensors in Middle garage to turn on and off the lights as rooms are occupied. Savings of 20-60% will be saved. 75 bulbs.	180	420	400	500	2,600	electric	2.8
5	Install ccupancy sensors small West garage	Install occupancy sensors in Small West garage to turn on and off the lights as rooms are occupied. Savings of 20-60% will be saved. 36 bulbs.	85	250	400	500	5,100	electric	5.9
		MISCELLANEOUS							
6	Employee Training	Staff should be trained on the importance of energy costs and uses; this will translate to savings year round.	250	500	50	150	8760	both	0.6

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Bloomfield Township DPS Annex Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
7	Purchase Natural Gas from another source	Bundle up all the buildings on the campus and purchase natural gas from a broker, which can provide for 10-30% less than the utility rates.	500	1,500	0	500	8,760	costs natural gas	1.0
8	Purchase electricity from another source than DTE	When available, a replacement for DTE electricity should be pursued, as much as 1-2 cents per kwhr can be realized.	1,500	3,000	0	500	8,760	costs electric	0.3
9	Track Energy Use on Monthly Basis	Inform employees of use and track versus other buildings for comparison purposes. More detailed tracking can be accomplished with daily meter readings, which is not part of this project.	100	300	100	200	8760.0	both	2.0
10	Utility rebates	Several of the projects listed will be eligible for rebate incentives from Detroit Edison and natural gas utility.	Will depend on projects installed		will depend		8,760	both	n/a
Total all Projects			3,615	8,040	1,750	4,000			1.1
Total Proposed Projects (All projects are proposed)			3,615	8,040	1,750	4,000			1.1

Total all Proposed Projects (highlighted in

Low Side of Savings and Cost to Implement	**3,615**	1,750	
High Side of Savings and Cost to Implement	8,040		4,000

Annual Energy Costs		% Savings
Electric	21,383.00	
Natural Gas	5,235.00	

ROI Years

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Bloomfield Township DPS Annex Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
	Total	26,618.00							
	Low Side Savings	3,615	14%		0.48				
	High Side Savings	8,040	30%		0.50				

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Bloomfield Township Central Fire Station Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
		HVAC							
1	Tune up EMS systems	EMS system was set up using building design specifications and has not be fined tuned for all cases.	300	900	200	800	8,760	both	2.7
2	Run heating season temperatures at 68-72 deg. F	Reading during the audit were at various levels (66-76), which should not exceed 72.	400	800	100	500	5,800	both	1.3
3	Run AC cooling temperatures at a higher level, at 74-76 Deg. F	Many temperature readings during the audit were in the 60's, which too low.	800	1,200	100	500	3,600	both	0.6
4	Modify supply fan operations to vary air flow	Present air flows and registers are constant volume. Install VAV control systems. This will allow the air flow to vary to the needs at all times, versus running constant.	1,500	3,000	12,000	20,000	8,760	both	13.3
		HOT WATER							
5	Reduce Hot Water Use	Install devices in bathroom and other faucets to reduce the use of hot water. A 5-10% reduction should be realized.	20	40	100	200	8760	natural gas	10
		LIGHTING							
6	Install occupancy sensors in 11 rooms	Install occupancy sensors in 11 rooms throughout the building to turn on and off the lights as rooms are occupied. Savings of 20-60% will be saved.	280	840	1,800	2,600	5,100	electric	9.3

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Bloomfield Township Central Fire Station Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
		MISCELLANEOUS							
7	Install Drinking Fountain timers	Install timers on drinking fountains, so during times the facility is closed the units turn off. The cooling done during this time wastes electricity. Two units currently can utilize these timers.	60	77	50	65	5,000	electric	1.1
8	Kitchen appliances are Energy Star Product, make sure all replacements in the future are ES	The kitchen appliances are Energy Star. Future replacements should be up-to-date Energy Star products.	will depend on what is replaced		will depend		8,760	both	n/a
9	Employee Training	Staff should be trained on the importance of energy costs and uses; this will translate to savings year round.	150	300	150	500	8760	both	3.3
10	Purchase Natural Gas from another source	Bundle up all the buildings on the campus and purchase natural gas from a broker, which can provide for 10-30% less than the utility rates.	900	2,700	0	500	8,760	costs natural gas	0.6
11	Purchase electricity from another source than DTE	When available, a replacement for DTE electricity should be pursued, as much as 1-2 cents per kwhr can be realized.	2,200	4,400	0	500	8,760	costs electric	0.2

Bloomfield Township Central Fire Station Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
12	Track Energy Use on Monthly Basis	Inform employees of use and track versus other buildings for comparison purposes. More detailed tracking can be accomplished with daily meter reading, which is not part of this project.	100	200	100	200	8760.0	both	2.0
13	Utility rebates	Several of the projects listed will be eligible for rebate incentives from Detroit Edison and natural gas utility.	energy savings included above		will depend		8,760	both	n/a
Total all Projects			6,710	14,457	14,600	26,365			3.9
Total Proposed Projects (Either #5 or #6 can be implemented, the higher ROI project was cut)			5,210	11,457	2,600	6,365			1.2
Total all Proposed Projects (highlighted									
Low Side of Savings and Cost to Implement			**5,210**		**2,600**				
High Side of Savings and Cost to Implement				11,457		6,365			
	Annual Energy Costs		% Savings		ROI Years				
	Electric	22,800.78							
	Natural Gas	9,308.28							
	Total	32,109.06							
	Low Side Savings	5,210	16%		0.50				
	High Side Savings	11,457	36%		0.56				

APPENDIX A

Bloomfield Township Fire Station #2 Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
		HVAC							
1	Install EMS for this building independent of Metro system	Install EMS used on newer 4 buildings installed by METRO.	720	1,080	10,000	12,400	8,760	both electric and natural gas	17.2
2	Install tamper proof set back thermostats	Thermostats are allowed to be controlled by anyone that pleases to make a change. A prescribed set point will be established and the unit will be run at scheduled times. If the EMS system is installed, this will be included in that system.	450	900	800	1,200	8760	both electric and natural gas	2.7
		HOT WATER PROJECTS							
3	Replace Hot Water Heater	Install newer more efficient natural gas hot water heating system. Use one of the heaters that will be shut off in another township building.	60	90	500	1,500	8760	natural gas	25
4	Reduce hot water use	Install devices in bathroom and other faucets to reduce the use of hot water. A 5-10% reduction should be realized.	25	50	100	200	8760	natural gas	8
		LIGHTING							
5	Occupancy sensors in 8 rooms	Install occupancy sensors in 11 rooms throughout the building to turn on and off the lights as rooms are occupied. Savings of 20-60% will be saved. 63, T 8'S and 19 compact fluorescent.	300	900	1,600	2,400	5,100	electric	8.0

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Bloomfield Township Fire Station #2 Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
6	Replace exit lights with LED units	The existing exit signs use 20-50 watts per unit more than a new LED unit will. Units where not working, savings will not show up when compared to recent use, but versus what should be operating is shown on high side.	0	140	270	360	8,760	electric	2.6
	MISCELLANEOUS PROJECTS								
7	Kitchen appliances are Energy Star Product, make sure all replacements in the future are ES.	The kitchen appliances are Energy Star. Future replacements should be up to date Energy Star products.	will depend on what is replaced		will depend		8,760	both	n/a
8	Employee Training	Staff should be trained on the importance of energy costs and uses; this will translate to savings year round.	90	180	150	300	8760	both	3.3
9	Purchase Natural Gas from another source	Bundle up all the buildings on the campus and purchase natural gas from a broker, which can provide for 10-30% less than the utility rates.	350	1,050	0	500	8,760	costs natural gas	1.4
10	Purchase electricity from another source than DTE	When available, a replacement for DTE electricity should be pursued, as much as 1-2 cents per kwhr can be realized.	550	1,100	0	500	8,760	costs electric	0.9

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Bloomfield Township Fire Station #2 Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
11	Track Energy Use on Monthly Basis	Inform employees of use and track other buildings for comparison purposes. More detailed tracking can be accomplished with daily meter reading, which is not part of this project.	50	100	100	200	8760.0	both	4.0
12	Utility rebates	Several of the projects listed will be eligible for rebate incentives from Detroit Edison and natural gas utility.	energy savings included above		will depend		8,760	both	n/a
Total all Projects			2,545	5,490	13,420	19,360			7.6
Total Proposed Projects (Either #1 or #2 can be implemented, the higher ROI project was cut)			1,875	4,510	3,520	7,160			3.8
Total all Proposed Projects (highlighted									
Low Side of Savings and Cost to Implement			**1,875**		**3,520**				
High Side of Savings and Cost to Implement				4,510		7,160			
	Annual Energy Costs		% Savings		ROI Years				
	Electric	5,894.00							
	Natural Gas	4,024.00							
	Total	9,918.00							
	Low Side Savings	1,875	19%		1.88				
	High Side Savings	4,510	45%		1.59				

APPENDIX A

Bloomfield Township Fire Station #3 Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
		HVAC							
1	Install EMS for this building independent of Metro system	Install EMS used on newer four buildings installed by METRO. Project #3 will do a portion of this for a much lower cost.	1,000	1,500	9,000	10,750	8,760	both electric and natural gas	10.8
2	Replace Boiler with higher efficient unit	Present unit is recently installed, but it is an 82% efficient unit. New condensing units have efficiency ranges between 89-95%. When replacing the unit, install high efficiency units.	250	380	3,000	4,800	5,500	natural gas	19.2
3	Install tamper-proof set back thermostats	Thermostats are allowed to be controlled by anyone that pleases to make a change. A prescribed set point will be established and the unit will be run at scheduled times. If the EMS system is installed, this will be included in that system.	450	900	600	900	8760	both electric and natural gas	2.0
		HOT WATER PROJECTS							
4	Replace Hot Water Heater	Install newer more efficient natural gas hot water heating system, replaceelectrical unit. Use one of the heaters that will be shut off in another township building.	60	90	500	1,500	8760	natural gas	25
5	Reduce hot water use	Install devices in bathroom and other faucets to reduce the use of hot water. A 5-10% reduction should be realized.	20	40	100	200	8760	natural gas	10

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Bloomfield Township Fire Station #3 Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
		LIGHTING							
6	Replace existing T12 bulbs with more efficient T8 bulbs	Replace T12 bulbs with more efficient T8 bulbs and ballasts requiring 11-15.5 watts less per bulb on average. There are 86 bulbs to be replaced.	580	830	2,300	3,400	2600	electric	5.9
7	Replace Parking Lot Lights	Replace parking lot 175 watt fixtures with induction fixtures that will use 90 watts each.	120	150	600	900	4,400	electric	7.5
8	Occupancy sensors in 10 rooms	Install occupancy sensors in 10 rooms throughout the building to turn on and off the lights as rooms are occupied. Savings of 20-60% will be saved.	290	870	1,600	2,200	5,100	electric	7.6
9	Replace exit lights with LED units	The existing exit signs use 20-50 watts per unit more than a new LED unit will.	55	140	270	360			6.5
	MISCELLANEOUS PROJECTS								
10	Replace Toilets with low water use units	The present units use 3.6 gallons per flush, versus 1.6 gpf for new style units. A savings of 55%.	Water Savings	Water Savings					
11	Kitchen appliances are Energy Star Product, make sure all replacements in the future are ES	The kitchen appliances are not Energy Star. Future replacements should be up-to-date Energy Star products.	will depend on what is replaced		will depend		8,760	both	n/a
12	Employee Training	Staff should be trained on the importance of energy costs and uses; this will translate to savings year round.	50	150	150	300	8760	both	6.0

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Bloomfield Township Fire Station #3 Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
13	Purchase Natural Gas from another source	Bundle up all the buildings on the campus and purchase natural gas from a broker, which can provide for 10-30% less than the utility rates.	320	960	0	500	8,760	costs natural gas	1.6
14	Purchase electricity from another source than DTE	When available, a replacement for DTE electricity should be pursued, as much as 1-2 cents per kwhr can be realized.	670	1,320	0	500	8,760	costs electric	0.7
15	Track Energy Use on Monthly Basis	Inform employees of use and track other buildings for comparison purposes. More detailed tracking can be accomplished with daily meter reading, which is not part of this project.	50	100	100	200	8760.0	both	4.0
16	Utility rebates	Several of the projects listed will be eligible for rebate incentives from Detroit Edison and natural gas utility.	energy savings included above		will depend		8,760	both	n/a
	Total all Projects		3,915	7,430	18,220	26,510			6.8
	Total Proposed Projects (Either #5 or #6 can be implemented, the higher ROI project was cut)		2,025	4,630	3,420	6,060			3.0
Total all Proposed Projects (highlighted in									
Low Side of Savings and Cost to Implement			**2,025**		**3,420**				
High Side of Savings and Cost to Implement				4,630		6,060			
	Annual Energy Costs		% Savings		ROI Years				

APPENDIX A

Bloomfield Township Fire Station #3 Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
	Electric	6,756.00							
	Natural Gas	3,264.00							
	Total	10,020.00							
	Low Side Savings	2,025	20%		1.69				
	High Side Savings	4,630	46%		1.31				

APPENDIX A

Bloomfield Township Fire Station #4 Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
		HVAC							
1	Install EMS for this building independent of Metro system	Install EMS used on newer four buildings installed by METRO	1,000	1,500	9,000	10,750	8,760	both electric and natural gas	10.8
2	Replace Boiler with higher efficient unit	Present unit is recently installed, but it is a 80% efficient unit,. 528,000 btu/ hr. New condensing units have efficiency ranges of 89-95% efficiency. When replacing the unit install high efficiency unit. Install smaller unit and put infra red tube heaters in apparatus room.	500	760	6,000	8,500	5,500	natural gas	17.0
3	Install Gas Infra Red Tube Heaters in Apparatus room	Gas infra red units are 30-50% more efficient than using unit heats in high ceiling rooms.	480	800	4,500	6,000	5,500	natural gas	12.5
4	Replace Lenox Air Conditioning Unit	Install unit that has a 3.00 SEER higher efficiency unit. This will save 30% of the electricity to run the AC unit. 5 ton unit.	660	990	5,000	7,000	2,800	electric	10.6
5	Install tamper proof set back thermostats	Thermostats are allowed to be controlled anyone that pleases to make a change. A prescribed set point will be established and the unit will be run at scheduled times. If the EMS system is installed this will be included in that system.	450	900	600	900	8760	both electric and natural gas	2.0

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Bloomfield Township Fire Station #4 Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
		HOT WATER PROJECTS							
6	Replace Hot Water Heater	Install newer more efficient natural gas hot water heating system, replaces electrical unit. Use one of the heaters that will be shut off in another township building.	60	90	500	1,500	8760	natural gas	25
7	Reduce hot water use	Install devices in bathroom and other faucets reduce the use of hot water. A 5-10% reduction should be realized.	20	40	100	200	8760	natural gas	10
		LIGHTING							
8	Replace existing T12 bulbs with more efficient T 8 bulbs	Replace T12 bulbs with more efficient T 8 bulbs and ballasts requiring 11-15.5 watts less per bulb on average. There are 72 bulbs to be replaced	480	700	1,950	2,800	5,200	electric	5.8
9	Replace Parking Lot Lights	Replace parking lot 175 watt fixtures with induction fixtures that will use 90 watts each.	210	270	1,000	1,500	4,400	electric	7.1
10	Occupancy sensors in 13 rooms	Install occupancy sensors in 13 rooms throughout the building to turn on and off the lights as rooms are occupied. Savings of 20-60% will be saved.	330	1,000	2,080	2,900	5,100	electric	8.8
11	Replace exit lights with LED units	The existing exit signs use 20-50 watts per unit more than a new LED unit will.	55	140	270	360			6.5
		MISCELLANEOUS PROJECTS							
12	Replace Toilets with low water use units	The present units use 3.6 gallons per flush, versus 1.6 gpf for new style units. A savings of 55%.	Water Savings	Water Savings					

APPENDIX A

Bloomfield Township Fire Station #4 Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
13	Kitchen appliances are Energy Star Product, make sure all replacements in the future are ES	The kitchen appliances some are and some are not Energy Star. Future replacements should be up to date Energy Star products.	will depend on what is replaced		will depend		8,760	both	n/a
14	Employee Training	Staff should be trained on the importance of energy costs and uses; this will translate to savings year round	60	180	150	300	8760	both	5.0
15	Purchase Natural Gas from another source	Bundle up all the buildings on the campus and purchase natural gas from a broker, which can provide for 10-30% less than the utility rates.	560	1,680	0	500	8,760	costs natural gas	0.9
16	Purchase electricity from another source than DTE	When available a replacement for DTE electricity should be pursued, as much as 1-2 cents per kwhr can be realized	720	1,440	0	500	8,760	costs electric	0.7
17	Track Energy Use on Monthly Basis	Inform employees of use and track versus other buildings for comparison purposes. More detailed tracking can be accomplished with daily meter reading, which is not part of this project.	50	100	100	200	8760.0	both	4.0
18	Utility rebates	Several of the projects listed will be eligible for rebate incentives from Detroit Edison and natural gas utility.	energy savings included above		will depend		8,760	both	n/a
Total all Projects			5,635	10,590	31,250	43,910			7.8

APPENDIX A

Bloomfield Township Fire Station #4 Project Priority List

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
Total Proposed Projects (Either #5 or #6 can be implemented, the higher ROI project was cut)			2,935	6,450	6,250	10,160			3.5
Total all Proposed Projects (highlighted									
Low Side of Savings and Cost to Implement			**2,935**		**6,250**				
High Side of Savings and Cost to Implement				6,450		10,160			
	Annual Energy Costs		% Savings		ROI Years				
	Electric	7,299.00							
	Natural Gas	5,625.00							
	Total	12,924.00							
	Low Side Savings	2,935	23%		2.13				
	High Side Savings	6,450	50%		1.58				

APPENDIX A

Bloomfield Township Senior Center Potential Project Listing

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
		HVAC							
1	Tune up EMS systems	EMS system was set up using building design specifications and has not be fined tuned for all cases	700	1,400	400	2,000	8,760	both	2.9
2	Install blinds in exercise room	Sun increases the cooling load and makes it difficult to keep this room comfortable for people using this room.	500	950	1,500	3,000	8,760	both	6.0
3	Heating Thermostat Set Points, lowered	Operate temperatures in offices at 68-71 degrees F and garages, basements etc. at 65-68 degrees F. Several temperatures ranged several degrees above these levels.	500	1,500	100	1,000	8,760	both	2.0
4	Air Conditioning Thermostat Set Points, raised	Operate Air Conditioning set points in offices at 74-76; garage no A/C; basement 74-76. Several points ranged lower during the audits.	500	2000	100	1,000	8,760	both	2.0
		POOL PROJECTS							
5	Run pool water at recommended temperatures	Red Cross recommends 78 degree water temperature, pools with more seniors using temperatures range from 80-82 degrees. Presently the pool is run at 94 degrees F, if you cut back 2 degrees savings will be 11%, 4 degree 17%.	3,000	4,650	0	100	8760	both	0.0

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Bloomfield Township Senior Center Potential Project Listing

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
6	Pool Covers	Utilize pool covers on the three pools during non-operating periods. Savings can be as much as 40-75% of the energy to heat the hot water during the non-operating periods. Seventy hours per week are non-operating hours, which is 46.5% of the time. Savings can reach 16-31% of the total water heating for the pools.	8,000	9,800	3,000	15,000	8760	both	1.9
7	Run natatorium room temperature identical to water temp.	At present air temperature is 4-6 degrees lower than the water temperature. If the temperature is raised 4 degrees a savings of 13.3%.	4,250	6,000	0	1,000	8760	both	0.2
8	Increase Natatorium relative humidity	Relatively humidity was (38%) low compared to other typical natatoriums at 55-70% RH. An increase of 10%-22% will gain large benefits.	4,400	5,500	0	1,000	8760	both	0.2
9	Replace pool water heater	Present unit is 78% efficient, high efficient units are 90+% efficiency	600	900	3,000	4,500	8760.0	natural gas	7.5
		LIGHTING PROJECTS							
10	Occupancy Sensors	Install occupancy sensors in select rooms, bathrooms, conference rooms, art rooms. 76, T 8 and 74 compact fluorescent. Savings of 20-60% is typical. 8 rooms will be adapted with the OS.	420	1,260	800	1,200	3,120	electric	2.9

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Bloomfield Township Senior Center Potential Project Listing

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
11	Office Occupancy sensors	Install occupancy sensors in offices and associated rooms. 40, T 8 and 19 compact fluorescent. Savings of 20-60% is typical. 9 different rooms will be adapted.	140	520	900	1,350	3,120	electric	9.6
12	Recreation areas occupancy sensors	Install occupancy sensors in offices, locker rooms, storage, billiard room, mechanical room, etc. and associated rooms. 36, T 8 and 14 compact florescent bulbs to be controlled. Savings of 20-60% is typical. 8 different rooms will be adapted.	120	360	800	1,200	3,120		10.0
		MISCELLANEOUS PROJECTS							
13	Drinking Fountain timers	Install timers on drinking fountains, so during times the facility is closed the units turn off. The cooling done during this time is wastes electricity. 4 units can utilize these timers.	120	144	100	125	5,000	electric	1.0
14	Vending Machines	Minimize energy use of vending machines, install device which will cut back consumption during schedule off periods. Reduce lighting in units. Have vendors place high efficiency units. Two vending machines can utilize a control device to obtain these savings.	420	700	600	800	8,760	electric	1.9

Bloomfield Township Senior Center Potential Project Listing

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
15	Kitchen appliances are Energy Star Product, make sure all replacements in the future are ES	Most units are already Energy Star. When units need replaced ensure they are Energy Star.	will depend on units replaced				8.76	both	n/a
16	Employee Training	Staff should be trained on the importance of energy costs and uses; this will translate to savings year round.	250	500	100	500	8,760	both	2.0
17	Purchase Natural Gas from another source	Bundle up all the buildings on the campus and purchase natural gas from a broker, which can provide for 10-30% less than the utility rates.	2,200	6,000	250	1,000	8,760	both	0.5
18	Purchase electricity from another source than DTE	When available a replacement for DTE electricity should be pursued, as much as 1-2 cents per kwhr can be realized	3,500	7,000	250	1,000	8,760	both	0.3
19	Track Energy Use on Monthly Basis	Inform employees of use and track versus other buildings for comparison purposes. More detailed tracking can be accomplished with daily meter reading, which is not part of this project.	100	300	100	200	8,760	both	2.0

Bloomfield Township Senior Center Potential Project Listing

Project #	Project Name	Description of Project	Low Side Savings	High Side Savings	Low Side Capital Costs	High Side Capital Costs	Hours per year	Type of energy savings	YEARS ROI
20	Utility rebates	Several of the projects listed will be eligible for rebate incentives from Detroit Edison and natural gas utility.	Will depend on which projects are installed				8,760	both	n/a
Total all Projects			29,720	49,484	12,000	35,975			1.2
Total Proposed Projects (Either #5 or #6 can be implemented, the higher ROI project was cut)			29,720	49,484	12,000	35,975			1.2
Total all Proposed Projects									
Low Side of Savings and cost to implement			**29,720**		12,000				
High Side of Savings and Cost to Implement				49,484		35,975			
	Annual Energy Costs		% Savings		ROI Years				
	Electric	46,513.00							
	Natural Gas	27,222.00							
	Total	73,735.00							
	Low Side Savings	29,720	40%		0.40				
	High Side Savings	49,484	67%		0.73				

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