MECHANICAL INSULATORS
LMCT
Labor Management Cooperative Trust
ENERGY CONSERVATION SPECIALISTS

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www.MechanicalInsulatorsLMCT.com
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The following pages will outline a case study, which shows the benefits in energy and cost savings of properly installed mechanical insulation.

Insulation is a proven means for conserving energy, reducing greenhouse gas emissions, increasing process productivity, providing a safer and more productive work environment, controlling condensation (which can lead to mold growth), supporting sustainable design technology and a host of other benefits.

Mechanical insulation does all of this, while providing a return on investment (ROI) rate, which is seldom rivaled. Despite the proven ROI, insulation is often overlooked and its benefits undervalued. Insulation is truly the lost or forgotten technology. Can you think of a more important time than now to think about how insulation can help you?

An insulation system is a technology, which needs to be engineered and maintained throughout the entire process. Several studies have estimated roughly 10 to 30 percent of all installed insulation is now missing or damaged.

The practice of not replacing or maintaining an insulation system in a timely and correct manner reduces the full benefits of insulation, and in return, decreases the ROI. In many cases, significant other issues - such as excessive energy loss, corrosion under insulation (CUI), mold development, increased cost of operations and reduced process productivity or efficiency - develop.

You can learn more on www.MechanicalInsulatorsLMCT.com, where additional case studies can be viewed.

Please do not hesitate to contact me should you have any additional questions.
Thank you,

Peter Ielimi

Executive Director
Mechanical Insulators Labor Management Cooperative Trust

INSULATION ENERGY APPRAISAL
FINAL REPORT

For
Marshview Middle Schools
Sackville, New Brunswick

Presented by:
Joshua Sherrard
Heat & Frost Training Centre
1041 Bayside Drive
Saint John, NB
E2J 4Y2

Executive Summary

The insulation energy appraisal evaluated the performance of mechanical rooms at your facility All piping is currently insulated with 1-inch thick fiberglass insulation. Based on the analysis findings, the appraiser calculated a) the cost of operating line with existing insulation; b) the cost to operate with 1 inch thick fiberglass vs 1 ½ thick fiberglass. He also calculated emission saving if each facility was properly insulated. These calculations are summarized below.

Energy Cost

Heat loss at Marshview Middle facility listed at 255168 Kbtu per year
An estimated 5 year saving of $37636.05, and a simple payback return on investment in 1.6 years

Energy/Emissions Savings

Co_2 reduction at Marshview middle facility 14.79 Mt per year

Insulation and Energy Efficiency

Insulation systems improve the energy efficiency of a plant and reduce the level of emissions of greenhouse gases into the atmosphere. Systems that have an upgraded insulation system can achieve an even more dramatic increase in savings. A properly selected, installed and maintained insulation system can, in many cases, provide an excellent return on investment and quick payback through cost savings. When compared to other conservation measures, the payback is often very quick - usually less than six months. The savings are significant in terms of reduced energy use, increased efficiency, and reduced greenhouse gas emissions.

Conclusion

The appraiser commends Marshview Middle Facility on upkeeping and maintaining their insulation systems. The Marshview Middle facility insulation system is very well maintained also, and the finding show a relatively positive energy efficiency. Our analysis show that though each facility is believed to be insulated with proper thicknesses. But due to facility maintenance, there are some areas that, if insulated to meet the rest of facility insulation standards, would be able to significantly reduce their energy loss and reduce the level of greenhouse gas emissions.

ENERGY AUDIT MARSHVIEW MIDDLE

Total Heat Loss 5 year savings of $ 37,636.05

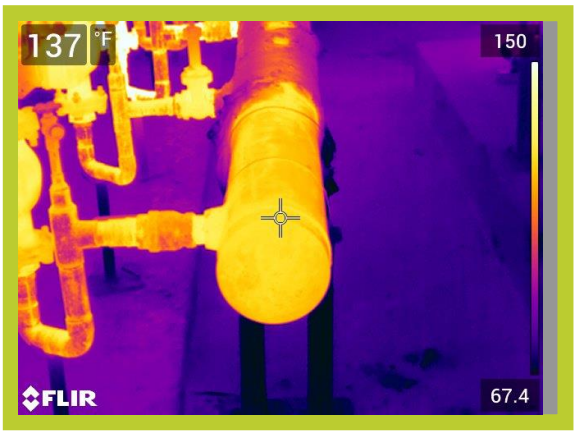
CO_2 Reduction of 14.79 MT/Year

Benefits:

- Simple payback period
- CO_2 Reduction
- Personnel safety

Audit Done By:
Joshua Sherrard
Certified Thermographer
Certified 3E Plus Auditor

Boiler Room

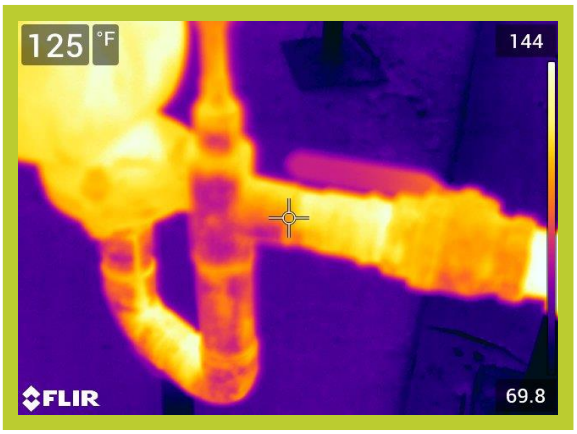


Operating Temperature,	137*F	Emittance of Surface	0.95
Ambient Temperature,	70*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	52500	$ 1815.90	$ 1815.90	$ 9079.50	3.6
1	7380	$ 255.00	$ 1560.90	$ 7804.50	0.6
1.5	5370	$ 186.30	$ 1629.60	$ 8148.00	0.3

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

Boiler Room

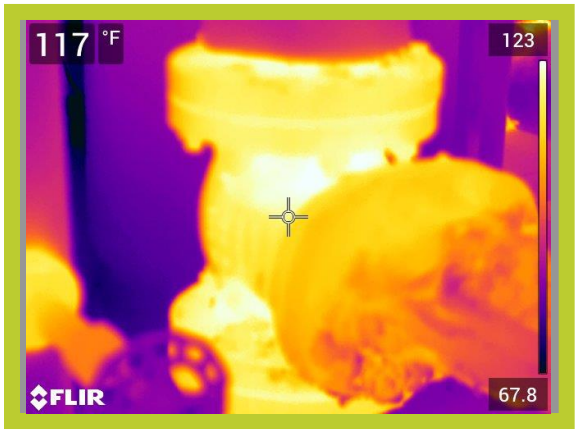


Operating Temperature,	125*F	Emittance of Surface	0.95
Ambient Temperature,	70*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	4428	$ 152.64	$ 152.64	$ 763.20	0.36
1	828	$ 28.56	$ 124.08	$ 620.40	0
1.5	660	$ 22.68	$ 129.96	$ 649.80	0

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

Boiler Room



Operating Temperature,	117*F	Emittance of Surface	0.95
Ambient Temperature,	70*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	5148	$ 178.08	$ 178.08	$ 890.40	0.36
1	693	$ 24.00	$ 154.08	$ 770.40	0.06
1.5	510	$ 17.64	$ 160.44	$ 802.20	0.03

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

Boiler Room

Operating Temperature,	136*F	Emittance of Surface	0.95
Ambient Temperature,	70*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	13605	$ 470.70	$ 470.70	$ 2353.50	0.9
1	1965	$ 68.10	$ 402.60	$ 2013.00	0.15
1.5	1365	$ 62.10	$ 408.60	$ 2043.00	0.15

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

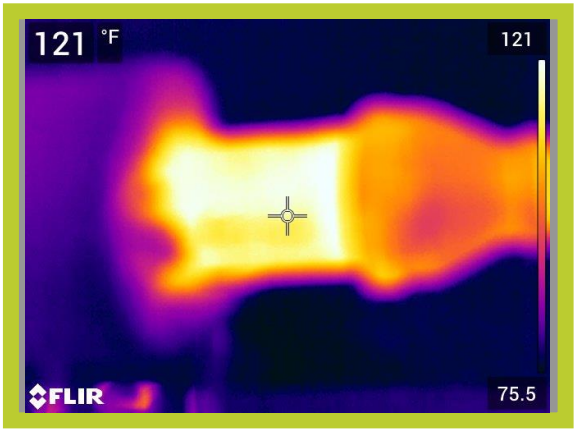
Boiler Room

Operating Temperature,	155*F	Emittance of Surface	0.95
Ambient Temperature,	70*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	15651	$ 541.53	$ 541.53	$ 2707.65	1.08
1	2061	$ 71.28	$ 470.25	$ 2351.25	0.18
1.5	1566	$ 54.00	$ 487.53	$ 2437.65	0.09

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

Boiler Room



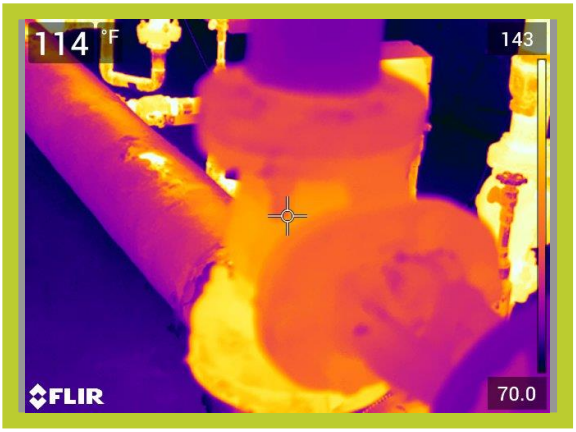
Operating Temperature,	121*F
Ambient Temperature,	70*F
Insulation selected	Fiberglass

Emittance of Surface	0.95
Expected Useful Life of Insulation System	20 yrs.
Operating hours per year	8320
Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	3723	$ 129.12	$ 129.12	$ 645.60	0.24
1	570	$ 19.80	$ 109.32	$ 546.60	0.06
1.5	444	$ 15.36	$ 113.76	$ 568.80	0.06

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

Boiler Room



Operating Temperature,	121*F	Emittance of Surface	0.95
Ambient Temperature,	70*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	9930	$ 343.50	$ 343.50	$ 1717.50	0.6
1	1323	$ 45.75	$ 297.75	$ 1488.75	0.09
1.5	888	$ 30.72	$ 312.78	$ 1563.90	0.06

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

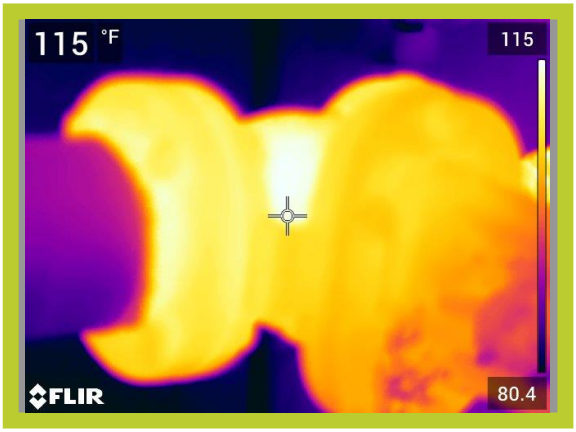
Boiler Room

Operating Temperature,	173*F	Emittance of Surface	0.95
Ambient Temperature,	70*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	15840	$ 548.01	$ 548.01	$ 2740.05	1.11
1	2046	$ 70.74	$ 477.27	$ 2386.35	0.15
1.5	1452	$ 50.19	$ 497.82	$ 2489.10	0.09

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

Mechanical Room

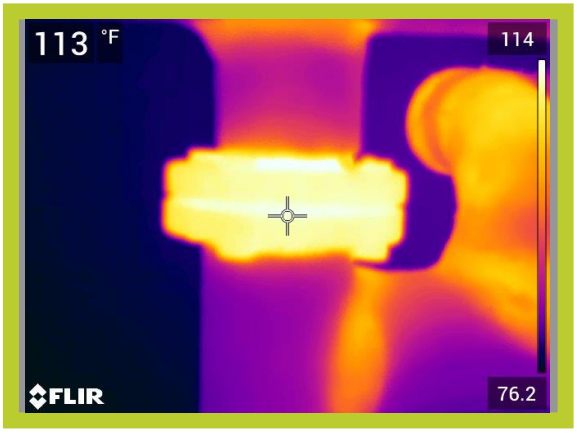


Operating Temperature,	113*F	Emittance of Surface	0.95
Ambient Temperature,	74*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	18216	$ 630.12	$ 630.12	$ 3150.60	1.32
1	2496	$ 86.40	$ 543.72	$ 2718.60	0.12
1.5	1836	$ 63.36	$ 566.76	$ 2833.80	0.12

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

Mechanical Room

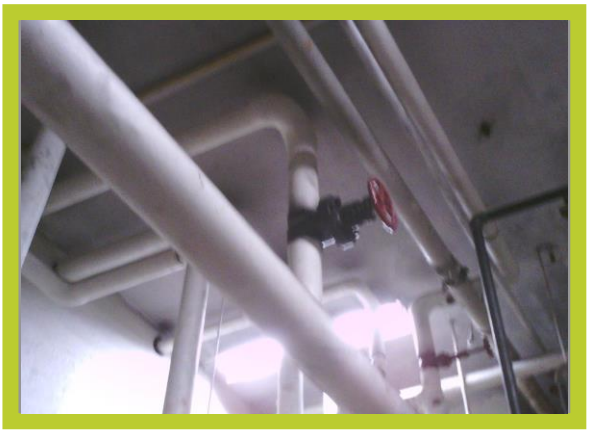


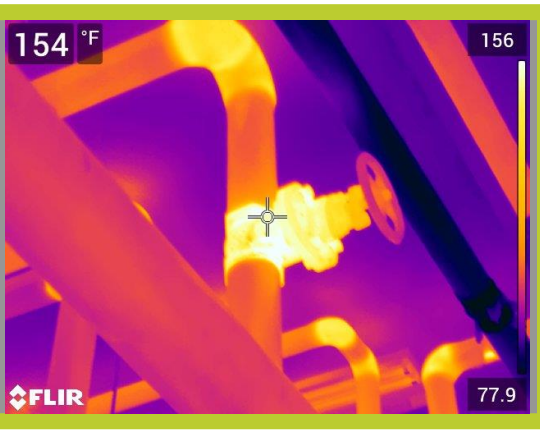
Operating Temperature,	113*F	Emittance of Surface	0.95
Ambient Temperature,	74*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	5169	$178.80	$ 178.80	$ 894.00	0.36
1	825	$ 28.53	$ 150.27	$ 751.35	0.06
1.5	600	$ 20.79	$ 158.01	$ 790.05	0.03

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

Mechanical Room





Operating Temperature,	154*F	Emittance of Surface	0.95
Ambient Temperature,	74*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	4428	$ 152.64	$ 152.64	$ 763.20	0.36
1	828	$ 28.56	$ 124.08	$ 620.40	0
1.5	660	$ 22.68	$ 129.96	$ 649.80	0

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

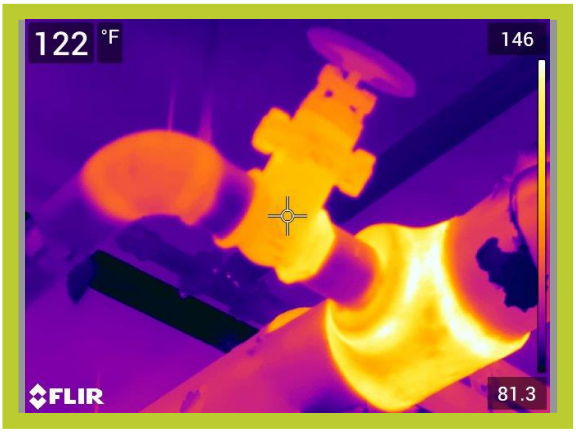
Mechanical Room

Operating Temperature,	157*F	Emittance of Surface	0.95
Ambient Temperature,	74*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	3507	$ 121.35	$ 121.35	$ 606.75	0.24
1	483	$ 16.68	$ 104.67	$ 523.35	0.03
1.5	366	$ 12.66	$ 108.69	$ 543.45	0.03

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

Mechanical Room



Operating Temperature,	122*F	Emittance of Surface	0.95
Ambient Temperature,	74*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	5169	$178.80	$ 178.80	$ 894.00	0.36
1	825	$ 28.53	$ 150.27	$ 751.35	0.06
1.5	600	$ 20.79	$ 158.01	$ 790.05	0.03

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

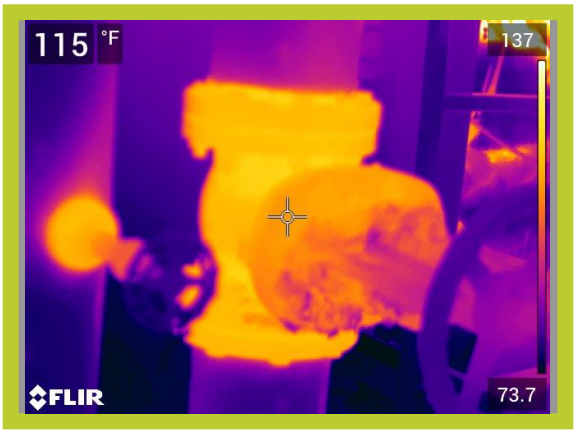
Mechanical Room

Operating Temperature,	125*F	Emittance of Surface	0.95
Ambient Temperature,	74*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	14184	$ 490.68	$ 490.68	$ 2453.40	0.96
1	2088	$ 72.24	$ 418.44	$ 2092.20	0.12
1.5	1464	$ 50.76	$ 439.92	$ 2199.60	0.12

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

Mechanical Room

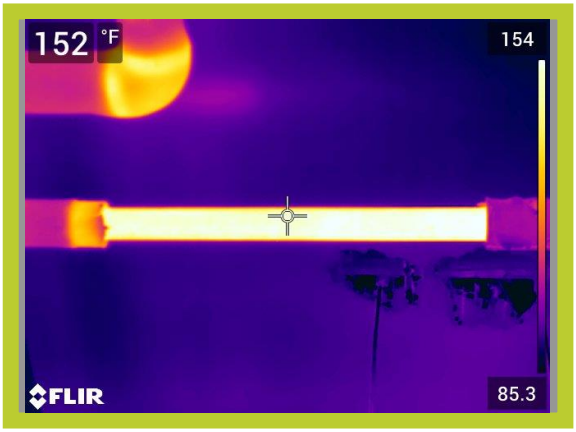


Operating Temperature,	125*F	Emittance of Surface	0.95
Ambient Temperature,	74*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	10056	$ 347.94	$ 347.94	$ 1739.70	0.72
1	1362	$ 47.04	$ 300.90	$ 1504.50	0.12
1.5	1002	$ 34.62	$ 313.32	$ 1566.60	0.06

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

Mechanical Room

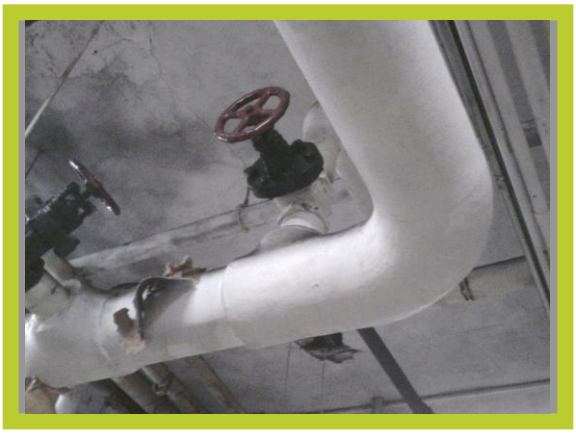


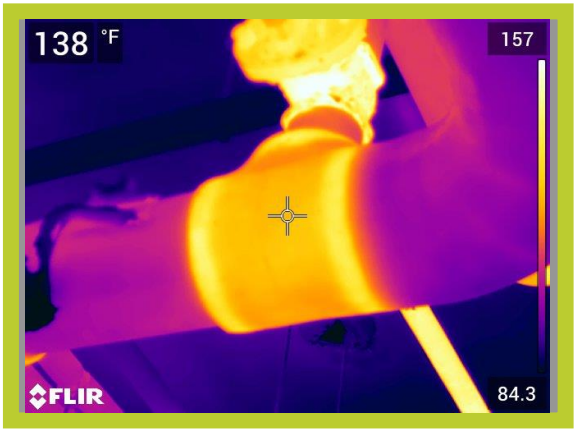
Operating Temperature,	117*F	Emittance of Surface	0.95
Ambient Temperature,	72*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	3504	$ 121.32	$ 121.32	$ 606.60	0.24
1	534	$ 18.54	$ 102.78	$ 513.90	0.06
1.5	402	$ 13.98	$ 107.34	$ 536.70	0

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

Mechanical Room





Operating Temperature,	138*F	Emittance of Surface	0.95
Ambient Temperature,	74*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST $/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	18675	$ 646.11	$ 646.11	$ 3230.55	1.35
1	2583	$ 89.37	$ 556.74	$ 2783.70	0.18
1.5	1809	$ 62.73	$ 583.38	$ 2916.90	0.09

*Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *

Results	
Simple Payback Period, yrs	1.6
Internal Rate of Return (IRR or ROI)	62.1%
Net Present Value,	$138,413

Calculations				
Year	Investment	Annual Savings	Annual Cash Flow	Cumulative Cash Flow
0	$-12,127	$0	$-12,127	$-12,127
1	$0	$7,527	$7,527	$-4,600
2	$0	$7,527	$7,527	$2,927
3	$0	$7,527	$7,527	$10,454
4	$0	$7,527	$7,527	$17,981
5	$0	$7,527	$7,527	$25,508
6	$0	$7,527	$7,527	$33,035
7	$0	$7,527	$7,527	$40,562
8	$0	$7,527	$7,527	$48,089
9	$0	$7,527	$7,527	$55,616
10	$0	$7,527	$7,527	$63,143
11	$0	$7,527	$7,527	$70,670
12	$0	$7,527	$7,527	$78,197
13	$0	$7,527	$7,527	$85,724
14	$0	$7,527	$7,527	$93,251
15	$0	$7,527	$7,527	$100,778
16	$0	$7,527	$7,527	$108,305
17	$0	$7,527	$7,527	$115,832
18	$0	$7,527	$7,527	$123,359
19	$0	$7,527	$7,527	$130,886
20	$0	$7,527	$7,527	$138,413