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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
Lewisville Middle Schools
Moncton, New Brunswick



Presented by:
Joshua Sherrard
Heat & Frost Training Centre
1041 Bayside Drive
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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 Lewisville Middle facility listed at 154629 Kbtu per year
An estimated 5 year saving of \$22,738.20, and a simple payback return on investment in 1.8 years

Energy/Emissions Savings

Co₂ reduction at Lewisville middle facility 9.39 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 Lewisville Middle Facility on upkeeping and maintaining their insulation systems. The Lewisville 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
LEWISVILLE
MIDDLE**

**Total Heat Loss
5 year savings of
\$ 22,738.20**

**CO₂ Reduction of
9.39 MT/Year**

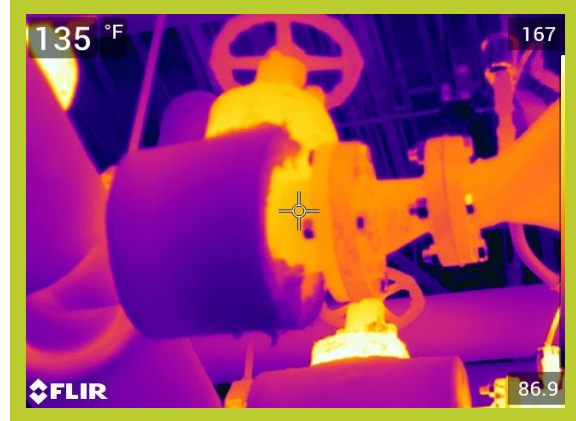


Benefits:

- Simple payback period
- CO₂ Reduction
- Personnel safety

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

Boiler Room



Operating Temperature,
Ambient Temperature,
Insulation selected

135*F
77*F
Fiberglass

Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

0.95
20 yrs.
8320
75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	50328	\$ 1741.14	\$ 1741.14	\$ 8705.70	3.6
1	6750	\$ 233.10	\$ 1508.04	\$ 7540.20	0.54
1.5	4734	\$ 163.44	\$ 1577.70	\$ 7888.50	0.36

Boiler Room

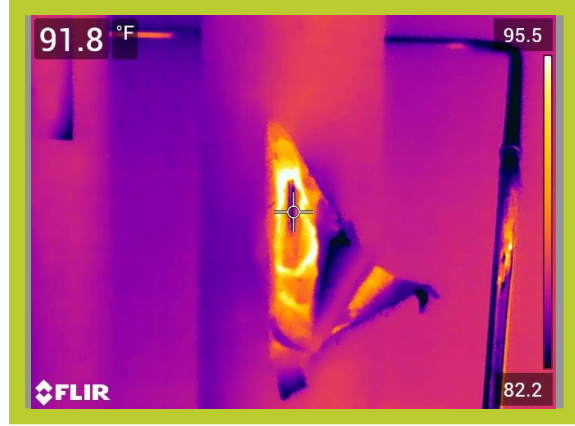


Operating Temperature,	170*F	Emittance of Surface	0.95
Ambient Temperature,	77*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	7704	\$ 266.58	\$ 266.58	\$ 1332.90	0.54
1	1074	\$ 37.20	\$ 229.39	\$ 1146.90	0.06
1.5	744	\$ 25.74	\$ 240.84	\$ 1204.20	0.06

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

Boiler Room



Operating Temperature,	92°F	Emittance of Surface	0.95
Ambient Temperature,	77°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	3729	\$ 129.18	\$ 129.18	\$ 645.90	0.27
1	525	\$ 18.18	\$ 111.00	\$ 555.00	0.03
1.5	396	\$ 13.68	\$ 115.50	\$ 577.50	0.03

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

Boiler Room



Operating Temperature,
Ambient Temperature,
Insulation selected

98°F
77°F
Fiberglass

Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

0.95
20 yrs.
8320
75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	3531	\$ 121.77	\$ 121.77	\$ 608.85	0.33
1	792	\$ 27.06	\$ 94.71	\$ 473.55	0
1.5	627	\$ 22.11	\$ 99.66	\$ 498.30	0

Boiler Room

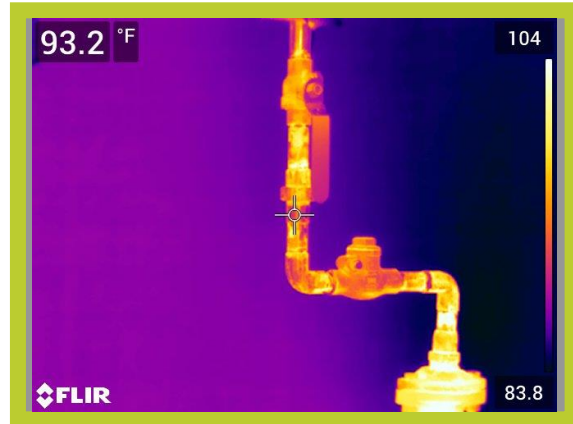


Operating Temperature, Ambient Temperature, Insulation selected	117*F 77*F Fiberglass	Emittance of Surface Expected Useful Life of Insulation System Operating hours per year Efficiency of fuel Conversion%	0.95 20 yrs. 8320 75%
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THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	16020	\$ 554.40	\$ 554.40	\$ 2772.00	1.08
1	2430	\$ 83.88	\$ 470.52	\$ 2352.60	0.18
1.5	1926	\$ 66.60	\$ 487.80	\$ 2439.00	0.18

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

Boiler Room

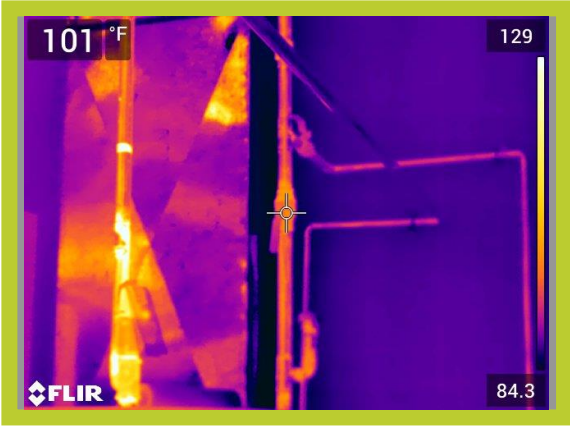


Operating Temperature, 93°F
 Ambient Temperature, 77°F
 Insulation selected, Fiberglass

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	2250	\$ 78.30	\$ 78.30	\$ 391.50	0.03
1	600	\$ 20.40	\$ 57.9	\$ 289.50	0
1.5	480	\$ 16.20	\$ 62.10	\$ 310.50	0

Boiler Room

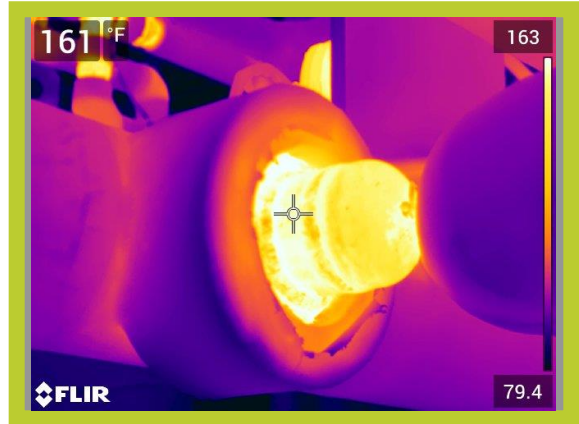


Operating Temperature,	101°F	Emittance of Surface	0.95
Ambient Temperature,	77°F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	4740	\$ 163.92	\$ 163.92	\$ 819.60	0.36
1	876	\$ 30.48	\$ 133.44	\$ 667.20	0.12
1.5	696	\$ 24.24	\$ 139.68	\$ 698.40	0

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

Boiler Room



Operating Temperature,	117*F	Emittance of Surface	0.95
Ambient Temperature,	77*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	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	22014	\$ 761.58	\$ 761.58	\$ 3807.90	1.53
1	2988	\$ 103.23	\$ 658.35	\$ 3291.75	0.18
1.5	2178	\$ 75.24	\$ 686.34	\$ 3431.70	0.18

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

Boiler Room



Operating Temperature,	165*F	Emittance of Surface	0.95
Ambient Temperature,	77*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	14520	\$ 502.20	\$ 502.20	\$ 2511	0.9
1	2790	\$ 96.30	\$ 405.90	\$ 2029.50	0.3
1.5	2190	\$ 75.30	\$ 426.90	\$ 2134.50	0.3

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

Boiler Room

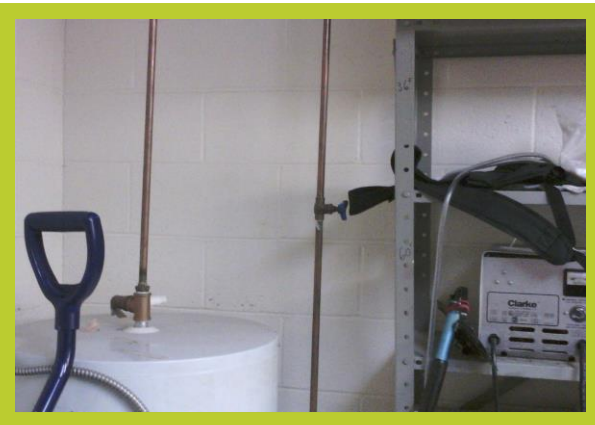
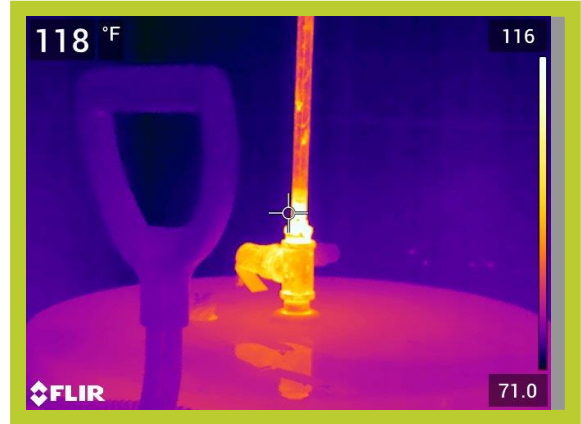


Operating Temperature,	159*F	Emittance of Surface	0.95
Ambient Temperature,	77*F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	16407	\$ 567.54	\$ 567.54	\$ 2837.70	1.17
1	2151	\$ 74.34	\$ 493.20	\$ 2466.00	0.18
1.5	1629	\$ 56.34	\$ 511.20	\$2556.00	0.09

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

Maintenance 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	2466	\$ 85.32	\$ 85.32	\$ 426.60	0.18
1	594	\$ 20.52	\$ 64.80	\$ 324.00	0
1.5	486	\$ 16.74	\$ 68.58	342.90	0

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

Results

Simple Payback Period, yrs	1.8
Internal Rate of Return (IRR or ROI)	54.6%
Net Present Value,	\$82,615

Calculations

Year	Investment	Annual Savings	Annual Cash Flow	Cumulative Cash Flow
0	\$-8,325	\$0	\$-8,325	\$-8,325
1	\$0	\$4,547	\$4,547	\$-3,778
2	\$0	\$4,547	\$4,547	\$769
3	\$0	\$4,547	\$4,547	\$5,316
4	\$0	\$4,547	\$4,547	\$9,863
5	\$0	\$4,547	\$4,547	\$14,410
6	\$0	\$4,547	\$4,547	\$18,957
7	\$0	\$4,547	\$4,547	\$23,504
8	\$0	\$4,547	\$4,547	\$28,051
9	\$0	\$4,547	\$4,547	\$32,598
10	\$0	\$4,547	\$4,547	\$37,145
11	\$0	\$4,547	\$4,547	\$41,692
12	\$0	\$4,547	\$4,547	\$46,239
13	\$0	\$4,547	\$4,547	\$50,786
14	\$0	\$4,547	\$4,547	\$55,333
15	\$0	\$4,547	\$4,547	\$59,880
16	\$0	\$4,547	\$4,547	\$64,427
17	\$0	\$4,547	\$4,547	\$68,974
18	\$0	\$4,547	\$4,547	\$73,521
19	\$0	\$4,547	\$4,547	\$78,068
20	\$0	\$4,547	\$4,547	\$82,615

