

ENERGY SAVINGS ANALYSIS

NORTH DAKOTA DEPARTMENT OF COMMERCE DIVISION OF COMMUNITY SERVICES SFN 59261 (03/2024)

Directions: Please have your engineering firm, utility, vendor, energy auditor, etc. complete the form to verify energy savings. Note: Not all boxes may apply to your project and attach a separate sheet showing the calculations used. If you have questions about this form, please contact Kevin Iverson at 701-328-5385 or kciverson@nd.gov.

Utility Rate Information

Cost/Unit KW	Cost/Unit kWh	Cost/Unit Ntr. Gas	Cost/Unit Water	Other

Energy Savings

Energy Conservation Measure (ECM)	Annual Demand Savings (KW)	Annual Electric Savings (kWh)	Annual Fossil Fuel Savings (mmBtu)	Annual Water Savings (1,000 Gal.)
Total				

Energy Cost Savings. Calculate by multiplying Utility Rate Information by Energy Savings.

Energy Conservation Measure(ECM)	Annual Demand Cost Savings (KW)	Annual Electric Cost (kWh)	Annual Fuel Cost Savings (mmBtu)	Annual Water Cost Savings	Total ECM Energy Cost Savings
	\$	\$	\$	\$	\$
	\$	\$	\$	\$	\$
	\$	\$	\$	\$	\$
Total	\$	\$	\$	\$	¢
Total Project Energy Cost Savings			Þ		

Payback. Provide the following information about and savings generated by this ECM.

Total Project Investment	Total Project Energy Cost Savings	Simple Payback Years
\$	\$	

Describe the basis for the estimated savings generated by this ECM:

Certification:

Authorized Signature	Date

For Commerce Use Only			
Verified		Authorized Signature	
Date			

This is an example for conversation of building lighting from florescent to LED. Existing lighting consists of 60 T12 (8') linear Lamps at 95 Watts each (total 5,700 watts or 5.7 Kw) to be replaced by 120 TLED, Type B Tubes at 12 watts each (total 1,440 watts or 1.44 Kw) used 12 hours per day, 360 days per year or 4,320 hours per year with a Kwh cost of \$0.117.

Total watts removed: 5,700 Total watts installed: 1,440 Net watts saved: 4,260 Hours of use per day and annually: 12 (360 days X 12 = 4,320) Multiply net watts saved by estimated annual use (4,260 X 4,320= 18,403,200 watts or 18,403 Kwh)

Estimated annual watts saved: Kwh saved 18,403.2 X Cost per Kwh \$0.117 Resulting annual savings \$,2153.17

Finally determine the energy savings payback: Cost of the Project: \$14,000 / \$2,153.17.00 = 6.505576208 (6.5 years)

This is an example for converting a #2 fuel oil boiler to an electric boiler. The current #2 fuel oil boiler is estimated to use 19,800 gallons of #2 fuel oil a year. The new electric boiler will use 438,600 kWh a year and during peak load times the #2 fuel oil boiler will still use 5,480 gallons a year. The cost of the electric boiler is \$84,900. Below are the steps to calculate the energy savings simple payback.

• Determine the current energy use for the #2 fuel oil boiler.

Estimated #2 fuel oil boiler fuel usage: 19,800 gallons/year. Using the conversion 139,000Btu/Gal of #2 fuel oil, converts to 2752.2 mmBtu/year

• The #2 fuel oil boiler and the electric boiler use different energy types to heat the building. In this case we would convert the electric boiler energy use to the #2 fuel oil boiler energy use (Btu).

Estimated electric boiler fuel usage: 438,600 kWh/year. Using the conversion 3412 Btu/kWh, converts to 1496.5 mmBtu/year

• Determine the peak load #2 fuel oil boiler energy use.

Estimated #2 fuel oil boiler fuel usage during peak load (using the high side): 5,480 gallons/year. Using the conversion 139,000Btu/Gal of #2 fuel oil, converts to 761.72 mmBtu/year

• Find the difference in what is currently used in energy and what is the proposed use of energy (Energy Savings) or

Current – (total of proposed electric boiler usage and peak #2 fuel oil boiler fuel usage): 2752.2 mmBtu/year – (1496.5 mmBtu/year + 761.72 mmBtu/year) = 493.98 mmBtu/year

• Find the energy cost savings.

Convert the energy savings to fuel cost: 493.98 mmBtu/year converting back to gallons using the conversion 139,000Btu/Gal of #2 fuel oil and the to dollars per year using \$2.9/gallon of #2 fuel oil, converts to \$10,306/year

• Finally determine the energy savings payback.

Using the total project cost and dividing it by the total project energy cost savings: \$84,900.00/(\$10,306/year) = 8.24 years