

Energy Savings Analysis
North Dakota Department of Commerce
Division of Community Services
 SFN 59261 (8/13)



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. If you have questions about this form, please contact Bruce Hagen at (701) 665-4496 or bahagen@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 Savings (kWh) | Annual Fuel Cost Savings (mmBtu) | Annual Water Cost Savings | Total ECM Energy Cost Savings |
|--|---------------------------------|------------------------------------|----------------------------------|---------------------------|-------------------------------|
| | \$ | \$ | \$ | \$ | \$ |
| | \$ | \$ | \$ | \$ | \$ |
| | \$ | \$ | \$ | \$ | \$ |
| Total | \$ | \$ | \$ | \$ | \$ |
| Total Project Energy Cost Savings | | | | | \$ |

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:

I, the undersigned representative of _____ (Company), certify that to the best of my knowledge this information is true and correct.

Signature

Title

Name (Please Print)

Date

| For Commerce Use Only | |
|-----------------------|-----------------------|
| Verified: | Authorized Signature: |
| Date: | |

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