Estimating Dual Fuel Heating Costs & Savings, Winter 2007-2008

Updated Nov, 2007 **For Southern Ohio**

Adding a heat pump to any furnace will lower your total winter heating costs. Here are some examples.
The estimates are for an average home near 1800 square feet in size, in Southern Ohio, or any home needing 63 Million BTUs per winter. Electric costs are an average at $.067/kWh.
The heat pump is a 13 SEER, and heats the home in all outdoor temperatures above 25 to 30 degrees.
Your existing (or new) furnace will make the remaining heat in temperatures below 25 to 30 degrees.
The estimates are based on the costs per fuel listed, which were current on the date noted above.
All fuel costs change frequently and the costs shown below may not be accurate at a future date.
The actual cost to heat your home in any given winter will depend on the weather, your living habits, your home's insulation and air leakage, the condition of your heating equipment, sun and wind exposure, the home's design and other variables.

Southern Ohio, Estimated Dual Fuel Heating Costs & Savings, Winter 2007 - 2008

Fuel	Type heating system and efficiency	Current Cost per unit of fuel	Cost per million BTU for furnace	Cost to heat per winter with furnace listed	Heat pump cost to make 60% of winter heat	Furnace cost to make 40% of winter heat	New total heating cost with Heat pump added	**Savings/** winter from old furnace heating costs
LP Gas (Propane)	65% furnace	$2.20/ gallon	$37.61	$2,369	$258	$948	$1,206	**$1,163**
	80% furnace	$2.20/ gallon	$30.56	$1,925	$258	$770	$1,028	**$897**
	90% furnace	$2.20/ gallon	$27.16	$1,711	$258	$684	$943	**$768**
Fuel Oil	60% furnace	$3.20/ gallon	$38.10	$2,400	$258	$960	$1,218	**$1,182**
	70% furnace	$3.20/ gallon	$32.65	$2,057	$258	$823	$1,081	**$976**
	85% furnace	$3.20/ gallon	$26.89	$1,694	$258	$678	$936	**$758**
Natural Gas	60% furnace	$1.15/CCF (therm)	$19.17	$1,208	$258	$483	$741	**$466**
	80% furnace	$1.15/CCF (therm)	$14.38	$906	$258	$362	$621	**$285**
	90% furnace	$1.15/CCF (therm)	$12.78	$805	$258	$322	$580	**$225**
Electric: Duke Energy in Ohio	Electric furnace & 13 Seer HP	$0.067/ kWh	$19.63	$1,237	Heat pump and electric furnace run together		$538	**$699**
	Electric furnace & 16 Seer HP	$0.067/ kWh	$19.63	$1,237	Heat pump and electric furnace run together		$476	**$761**
Other Electric Providers	Electric furnace & 13 Seer HP	$0.080/ kWh	$23.44	$1,477	Heat pump and electric furnace run together		$642	**$835**

Heat pump costs, when added to a fossil furnace, assume $.070 per kWh and $6.84 per Million BTU.
See page 2 for more details.

Add-on Heat Pump Cost per Million BTU

A dual fuel heating system is an electric heat pump added to a fossil fuel furnace. Sometimes it is called an Add-on Heat Pump (AOHP). A heat pump is an air conditioner in the summer and in the winter it works in conjunction with your furnace to reduce your heating costs.

Today's heat pumps work efficiently at all outdoor temperatures, but they are extremely energy efficient when they operate in the temperatures from 20 to 60 degrees. In this temperature range a new heat pump can generate heat at a very low cost.

When added to a gas or oil furnace, the heat pump is able to provide 60% to 70% of your total winter heat. The furnace is still used in the colder winter temperatures and will supply all the remaining heat.

Heat Pumps used with an Electric Furnace

When a heat pump has an electric furnace as the back-up system, the heat pump will run in all winter temperatures. This is an advantage of a total electric heat pump system since the efficiency of the heat pump is at least twice that of the furnace, even in the cold temperatures. When the electric furnace is needed to add supplemental heating, both systems will run together. The heat pump is not switched off.

The efficiency of these two systems working together can be measured for the entire winter by using a term called "Seasonal Coefficient of Performance" or Seasonal COP. Today's heat pumps will have a Seasonal COP of 2.2 to 2.4 which means they will generate heat at 2.2 times the efficiency of the electric furnace. This seasonal rating includes the energy used by the less efficient electric furnace.

Heat Pumps used with a Gas or Oil Furnace

In the table to the right, notice the average COPs listed for a dual fuel heat pump system are very high compared to a standard heat pump application.

If a heat pump only runs during the outdoor temperatures above 25 to 30 degrees, no back-up heat is needed at these times. As a result of running only in its optimum temperature range, the heat generated by a heat pump in a dual fuel system has a very low Cost per Million BTUs. This low heating cost will apply to about 60% to 70% of the winter heating.

The remaining 30% to 40% of the heating costs from the back-up furnace must be added to the heat pump costs to estimate total winter heating costs.

Add-on Heat Pump Cost per Million BTUs

The COP efficiencies listed below assume a heat pump runs only in outdoor temperatures above 25 to 30 degrees

	Existing 10 SEER AOHP	New 13-15 SEER AOHP
Seasonal Avg COP	2.80	3.00
Net BTU/kWh	9,556	10,239
Cost per kWh ⬇	Cost per MBTUs	Cost per MBTUs
$0.120	$12.56	$11.72
$0.115	$12.03	$11.23
$0.110	$11.51	$10.74
$0.105	$10.99	$10.25
$0.100	$10.46	$9.77
$0.095	$9.94	$9.28
$0.090	$9.42	$8.79
$0.085	$8.89	$8.30
$0.080	$8.37	$7.81
$0.075	$7.85	$7.32
$0.074	$7.74	$7.23
$0.070	$7.32	$6.84
$0.067	$7.01	$6.54
$0.060	$6.28	$5.86
$0.055	$5.76	$5.37
$0.052	$5.44	$5.08
$0.050	$5.23	$4.88