

Heat Pump Economics

Efficiency Vermont,
Senate Committee on Finance, 2/4/14

The Northeast's Heating Fuel Competition (Retail)

Energy Type	Unit	Btu/Unit	Efficiency	\$/Unit	\$/MMBtu
Wood	Cord	22,000,000	60%	\$193.00	\$14.62
Natural Gas	Therm	100,000	90%	\$1.55	\$17.22
Pellets	Ton	16,400,000	80%	\$247.00	\$18.83
Fuel Oil	Gallon	138,200	90%	\$3.72	\$29.91
Kerosene	Gallon	136,600	90%	\$4.19	\$34.08
Propane	Gallon	91,600	90%	\$2.96	\$35.90
Electricity	kWh	3,412	300%	\$0.15	\$14.65



- Fuel prices compete within 3 bands.
- With heat pumps, electricity falls into the 1st band.
- Is heat pump technology making combustion obsolete?

Theoretical Maximum Efficiency (COP)

	Technology	
	Combustion & Resistive	Heat Pump
Present Technology	0.95	2.0 - 4.0
Theoretical Maximum	1.0	6.0 - 17.0

- The efficiency gains for combustion technology have arrived.
- There is still room for improvement in heat pump technology.

Heating Fuel Cost Savings with an ASHP (COP 3.0)

Type of Energy	Unit	50 MMBtu/Yr	75 MMBtu/Yr	100 MMBtu/Yr
Wood (green)	Cord	\$28	\$41	\$55
Natural Gas	Therm	\$(136)	\$(204)	\$(272)
Pellets	Ton	\$(194)	\$(291)	\$(388)
Fuel Oil	Gallon	\$(800)	\$(1,200)	\$(1,601)
Kerosene	Gallon	\$(985)	\$(1,478)	\$(1,970)
Propane	Gallon	\$(1,218)	\$(1,827)	\$(2,435)
Electricity	kWh	\$(1,744)	\$(2,616)	\$(3,488)

- Many residents can save \$1,000 - \$2,000 year.
- Assumptions:
 - Offset 90% of heating fuel costs.
 - No cooling savings in the summer.