

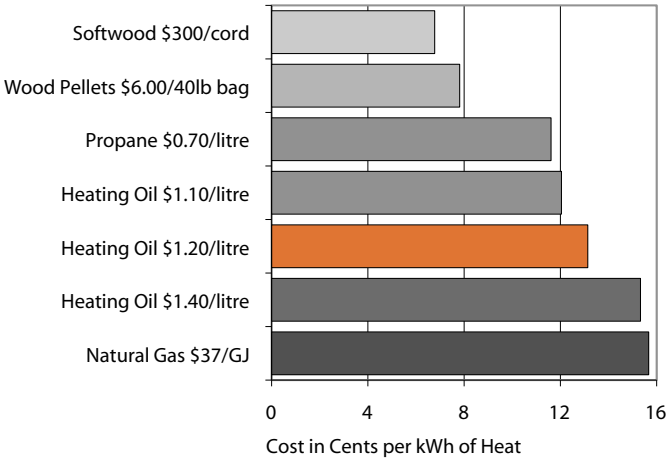
HEATING IN THE NWT

2012

Which heating fuels are used in the Northwest Territories?

- Heating Oil:** Everywhere in the NWT but to a lesser extent in Norman Wells, Hay River, and Inuvik.
- Natural Gas:** Norman Wells and until recently, Inuvik.
- Propane:** Hay River, Inuvik, and in smaller proportions in other communities on all-season roads.
- Wood Pellets:** South Slave, Fort Simpson, Yellowknife, and Behchoko. Use is increasing.
- Wood:** Throughout the NWT but less in Sachs Harbour, Ulukhaktuk, and Paulatuk where driftwood is sometimes used.
- Electricity:** Fort Smith only for some government buildings (interruptible power).

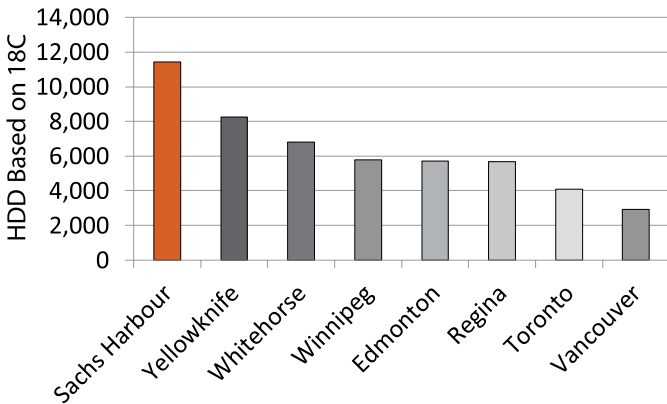
Fuel Heating Costs



How much heat?

The climate's impact on heating requirements is measured in heating degree days (HDD), which are calculated as a reference temperature minus daily average outdoor temperature, and then summed for each day in the year. The reference temperature is generally the temperature at which heating is required, and 18 °C is commonly used. The HDD for a few select Canadian locations are shown in the graph to the right.

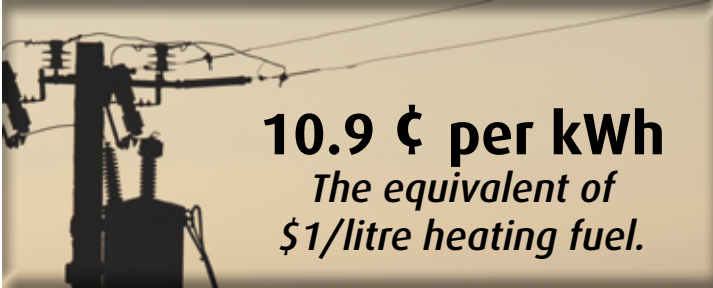
Heating Degree Days Canadian Cities



Electricity and Heating

Hydroelectricity is used for heating in some Canadian provinces including British Columbia, Quebec, and Manitoba, where prices are much lower than in the NWT.¹ Those provinces have numerous large hydro developments that produce relatively inexpensive electricity.

Diesel-fired electricity is rarely used for heating, as diesel generators are only about 30-40% efficient. Boilers and furnaces are typically 70% to 95% efficient, depending on technology and age, and are thus much more efficient than using diesel-fired electricity for heat. The chart on the next page shows the equivalent price of heating fuel in dollars per kWh.

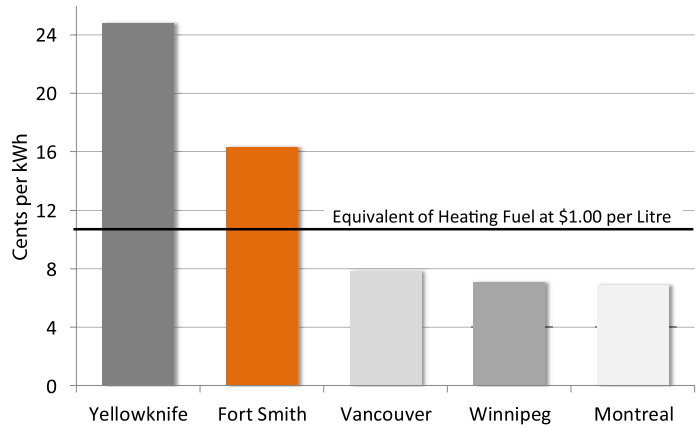


The marginal price of producing more electricity is lower than what we pay. Couldn't we use more of our northern resource for heating at this marginal rate?

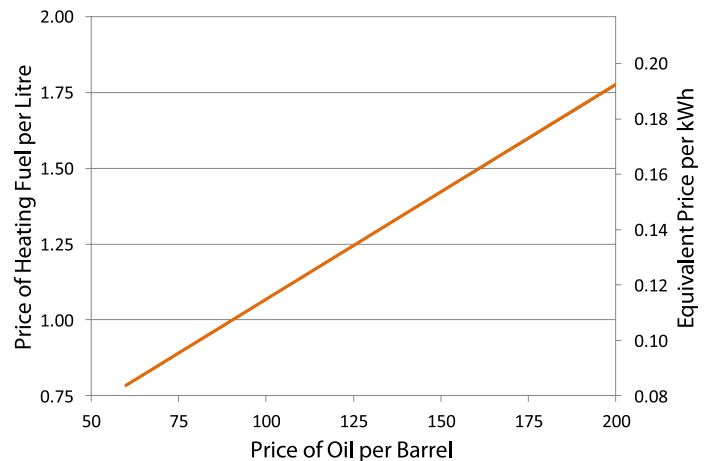
The GNWT uses electricity to heat a few buildings in Fort Smith. This electricity is interruptible, however, meaning that Northwest Territories Power Corporation can disconnect the buildings if other customers require the power. There are several significant challenges to using electricity for heat:

- The investment in infrastructure to allow electric heating is only used for a portion of the year, which reduces the benefit for ratepayers.
- River flows are lowest in the winter, meaning less capacity when heating requirements are the highest.
- Upgrading power lines, transformers, and service lines is usually necessary for the additional load.
- Separate electric meters are required to sell electricity at a lower rate for heating.
- Space is required in buildings for additional electric boilers to be installed beside the oil boiler(s) or electric duct heaters have to be installed in buildings with forced air heating systems.
- Total electrical and mechanical costs to install electric heating in houses in Lutsel K'e was estimated in a recent study at \$26,000 for a duct heater system, and \$32,000 for an electric boiler.³
- Electricity must cost less than 10.9 cents/kWh to provide a price advantage compared to heating fuel at \$1/litre.⁴

Electricity Prices: The NWT Compared to Cities where Electric Heating is Common



Heating Oil Cost in \$ per Litre and \$ per kWh



See Reference 2 for details.

References

1. Hydro Quebec (2010) Comparison of Electricity Prices in Major North American Cities: 2010. http://www.hydroquebec.com/publications/en/comparison_prices/pdf/comp_2010_en.pdf [accessed Feb 2, 2011]
2. Natural Resources Canada (2011) Fuel Focus. <http://nrcan.gc.ca/eneene/focinf-eng.php> [accessed Feb 2, 2011] The relationship between crude oil prices and heating fuel prices shown is based on the relationship between the two prices during the 3-year period from Jan 2008 to Jan 2011.
3. George, Brian (2011) Interruptible Heating Power: Lutsel K'e, NT. Williams Engineering Canada. Jan 26, 2011.
4. Price of 10.9 cents/kWh assumes an efficiency of 85% for new oil boiler/furnace installations.