

Are Heat Pumps worth the cost?

Last spring, I asked Churches using heat pumps to provide data for an analysis of the cost effectiveness of their heat pumps. Only one Church provided data. The results detailed below are for that Church only.

Eight heat pumps were installed in late spring 2020 at a cost of \$35,729. Heat exchangers were mounted in the sanctuary. The Church was closed for part of 2020 due to Covid. The period from January 1, 2021 to January 1, 2025 was used in the analysis.

I looked at actual payments by the Church for electricity and (oil) heat with heat pumps installed. Next, I calculated what the Church's costs for electricity and heat would have been based on 2019 costs, adjusted for changes in the price of oil, heating degree days, and a five percent annual increase in electricity rates.

Results are below:

2021-2025	Church Actual Cost with Heat pumps	Calculated Costs for electric and heat w/o heat pumps	Difference
Electricity	24,897	13,842	11,055
Heating oil	7,503	19,637	(12,134)
Total	32,400	33,479	1,079
Cost per Year	8,100	8,370	270

The Church reduced their costs of utilities (electricity and heat) by an average \$270 a year from 2021 to 2025. Increased use of electricity and decreased use of fuel oil definitely reduces the Church's carbon footprint. A large expenditure for heat pumps cannot be justified based on savings in utility costs. Heat pumps are sometimes sold as "free heat". While technically the heat is free, collecting and distributing the heat requires a lot of electricity and a large monthly expense.

There are a lot of factors to consider before making the decision to install heat pumps. Look at all the factors before making a decision.

Factors to consider

1. Does your electrical system have enough capacity to provide the electricity for heat pumps or will you need to upgrade your electrical service if you install heat pumps?

2. Heat pump heating efficiency in cold weather vary greatly. Watch this closely when deciding which heat pump to buy. Some heat pumps will continue to produce heat when the temperature is zero outside. Others stop producing heat as high as 20 degrees.
3. What's the condition of your current heating system? Heat pumps will not totally replace your existing heating system. You will need to have a supplemental heating system for extreme cold days.
4. Heat pumps have outdoor and indoor components (compressors outside and heat exchangers inside) Will the appearance of the heat exchangers on your sanctuary walls and compressors outside be acceptable to your members? If you currently have hot air heat, can your hot air ducts be used to distribute heat from heat exchangers (so that you won't need heat exchangers on the sanctuary walls)?

Comments from the Pastor at the Church studied

1. Temperature settings can be controlled remotely
2. The heat is much more passive and quieter...
3. The heat pumps provide some level of cooling on a hot summer day
4. Humidity is reduced Mildew problem disappeared with the lower humidity,
5. Controlled humidity is better for the pipe organ.
6. Heat is on all the time. Usage of the sanctuary has increased by a local college music program.
7. Increased usage is a form of outreach to the community.

If you would like a copy of my worksheets, email me at Jhill2583@gmail.com