Heating/Cooling Options Report for UCIM Annual Meeting

This is a summary document, please see other reports, presentations and videos at ucim.org for additional information.

Current Heating and Cooling at UCIM

Heating

2 Natural Gas Furnaces*: heating Fellowship Hall, Narthex, Sanctuary, Macaskill, Kitchen

1 Natural Gas Furnace*: heating Offices and Classrooms

Supplemental Baseboard heaters in various locations (eg bathrooms, entry way)

*at or near life expectancy

Cooling

2 Air to Air Heat Pumps: cooling Macaskill and Kitchen

Roof top unit*: cooling Offices and Classrooms

*at or near life expectancy

Summary of Options for Replacement

The Board is presenting 5 options for action.

NOTE: All the estimated costs are subject to change: they are only ESTIMATES, none of them include GST or other applicable taxes.

1. **Natural Gas Heating** See pages 2 and 5 for more details
2. **Natural Gas Heating & Electric Air Conditioning** See pages 2 and 5 for more details

3. **Electric (Furnaces) Heating** See pages 3 and 6 for more details
4. **Electric (Furnaces) Heating & Electric Air Conditioning** See pages 3 and 6 for more details

5. **Geothermal (Ground Source Heat Pump) Heating and Air Conditioning** See pages 4 and 6 for more details

Options 1 and 2 Natural Gas Furnace Replacement and Adding Air Conditioning

Natural Gas HEATING	
Estimate[a] for replacement 2 large NG furnaces • Demolish current furnaces • Supply and install two new units • Electrical work	$158,000
Estimate[b] for replacement 1 smaller NG furnace	$12,000
Total Cost Estimate	$170,000
No incentive grants available	-$0
Total Estimate	**$170,000**
[a]Estimate does not include GST, dated June, 2022 [b]Estimate is rough, based on general industry standards and could be higher	

Natural Gas HEATING and Electric COOLING SYSTEM	
Estimate[a] for replacement 2 large NG furnaces • Demolish current furnaces • Supply and install two new units • Electrical work	$158,000
Estimate[b] for replacement 1 smaller NG furnace	$12,000
Estimate[c] for adding Air Conditioning • Supply and install on roof outdoor air conditioning unit	$104,000
Total Cost Estimate	$274,000
No incentive grants available	-$0
Total Estimate	**$274,000**
[a]Estimate does not include GST, dated June, 2022 [b]Estimate is rough, based on general industry standards and could be higher	

- The price of Natural Gas is set to rise as much as 35% in the next 7 years, and more beyond that, because of the Carbon Tax. This is more quickly and more substantially than electricity is estimated to rise in Manitoba.

Options 3 and 4 Electric Furnace Replacement and Adding Air Conditioning

ELECTRIC FURNACE HEATING	
Estimate[a] for install 2 Electric Furnaces • Demolish current furnaces • Supply and install two new units • Electrical upgrade (Hydro)	$132,000
Estimate for install 1 smaller Electric furnace	$6,000
Total Cost Estimate	$138,000
Faithful Footprints (UCC) Grant[b]	-$10,000
Total Estimate	**$128,000**
[a]Estimate does not include GST, estimate April 2023 *[b] This is an expectation based on conversations in April 2023*	

ELECTRIC FURNACE HEATING and Electric COOLING SYSTEM	
Estimate[a] for install 2 Electric furnances • Demolish current furnaces • Supply and install two new units • Electrical upgrade (Hydro)	$132,000
Estimate for install 1 smaller Electric furnace	$6,000
Estimate[a] for adding Air Conditioning • Supply and install on roof outdoor air conditioning unit	$104,000
Total Cost Estimate	$242,000
Faithful Footprints (UCC) Grant[c]	-$10,000
Total Estimate	**$232,000**
[a]Estimate does not include GST, expires April 10, 2023 *[b]Estimate does not include GST, dated June, 2022* *[c] This is an expectation based on conversations in April 2023*	

- The operating cost of an electric furnace would be about 50% greater than the current cost of Natural Gas (about $4,000 annually), but gas is set to rise faster in price.

Options 5 Geothermal System Replacing Heating and Adding Air Conditioning

Ground Source Heat Pump HEATING AND COOLING	
Estimate[a] for Ground Source Heat Pump exterior work • Install 30 ton horizontal ground loop • Electrical work contingency • Ground loop materials	$85,000
Estimate for Ground Source Heat Pump interior • Removal existing system • Installation of heat pumps • Installation of Heat Recovery Ventilator (HRV) • Ductwork • Testing and Balancing • Contingency for Electrical ($30K)	$264,000
Total Cost Estimate	$349,000
Efficiency Manitoba Incentive Grant[b]	-$30,000
Faithful Footprints (UCC) Grant[c]	-$30,000
Total Estimate	**$289,000**
[a]Estimate does not include GST, expires April 10, 2023 *[b]This is an estimate based on Efficiency Manitoba programs as of January 2023* *[c] This is an expectation based on conversations in December 2022*	

- The soil conditions are suitable on UCiM's lot for the installation of a geothermal (ground source) loop.
- A geothermal installation of the size required to assure heating and cooling of the entire existing building can be done in the available space.
- The estimate includes a Heat Recovery Ventilator which increases ventilation and air quality. This could be added to the other systems, but is not reflected in the estimates.

Comparing the Cost of Ongoing Operation

CURRENT[a] ANNUAL HEATING & COOLING COSTS[b]	
Main Natural Gas Heating	$3200.
Office Natural Gas Heating	$600.
Air Conditioning	$200.
Total	**$4000.**
[a] *based on February 2023 cost of Natural Gas and electricity* [b] *includes Carbon Tax, excludes other taxes, does not include cost of hot water*	

- Additional air conditioning through any of the options will result in an increase in electricity cost. The amount of electricity required by all options is comparable.

Option 1: Replacing Natural Gas with Natural Gas

NEW NATURAL GAS FURNACES ANNUAL OPERATING COSTS[a b]	
Main Natural Gas Heating	$2700.
Office Natural Gas Heating	$600.
Air Conditioning (existing)	$200.
Total	**$3,500.**
[a] *based on February 2023 cost of Natural Gas and electricity* [b] *includes Carbon Tax, excludes other taxes, does not include cost of hot water*	

Option 2: Replacing Natural Gas with Natural Gas and adding Air Conditioning

NEW NATURAL GAS FURNACES and NEW AIR CONDITIONING ANNUAL OPERATING COSTS[a b]	
Main Natural Gas Heating	$2700.
Office Natural Gas Heating	$600.
Air Conditioning (existing and additional)	$800.
Total	**$4,100.**
[a] *based on February 2023 cost of Natural Gas and electricity* [b] *includes Carbon Tax, excludes other taxes, does not include cost of hot water*	

Option 3: Replacing Natural Gas furnaces with Electric Furnaces

NEW ELECTRIC FURNACES ANNUAL OPERATING COSTS[a b]	
Main Electric Heating	$4500
Office Electric Heating	$1100
Air Conditioning (existing)	$200
Total	**$5800**
[a] *based on February 2023 cost of electricity* [b] *excludes other taxes, does not include cost of hot water*	

Option 4: Replacing Natural Gas furnaces with Electric Furnaces and adding Air Conditioning

NEW ELECTRIC FURNACES and NEW AIR CONDITIONING ANNUAL OPERATING COSTS[a b]	
Main Electric Heating	$4500
Office Electric Heating	$1100
Air Conditioning (existing and additional)	$800
Total	**$6400**
[a] *based on February 2023 cost of electricity* [b] *excludes other taxes, does not include cost of hot water*	

Option 5: Replacing existing heating and cooling with Geothermal (Ground Source Heat Pump)

Ground Source Heat Pump (HEATING & COOLING) ANNUAL OPERATING COSTS[a b]	
GSPH Heating (entire building)	$2200.
Air Conditioning (entire building)	$800.
Total	**$3,000.**
[a] *based on February 2023 cost of electricity* [b] *excludes taxes, does not include cost of hot water*	

Annual Operating Costs Current Rates and Carbon Tax Increase by 2030[a]		
	2023 rates	2030 rates
Natural Gas Heat	$3,500	$4,700
Natural Gas Heat and Air	$4,100	$5,300
Electric Heat	$5,800	$5,800
Electric Heat and Air	$6,400	$6,400
Geothermal	$3,000	$3,000
[a] *Carbon Tax will continue to increase beyond 2030*		

Installation, Lifespan and Maintenance

Installation			
	Natural Gas	**Electric**	**Geothermal**
Time for install	**2 -3 weeks**	**2 -3 weeks**	**2 -3 weeks**
Installation Period	**Summer**	**Summer**	**Summer**
Outside disruption	**Minor parking**	**Minor parking**	**Minor Parking Digging small trench**
Contractor Oversight[b]	**Yes**	**Yes**	**Yes**
New Ducting	**No**	**No**	**No**
Computerized Controls/Thermostat	**Yes**	**Yes**	**Yes**
Lifespan			
Interior Mechanical system (furnace/heat pump)	**35-40 years[a]**	**25 – 30 years**	**25-30 years**
Exterior Air Conditioner	**20 – 25 years**	**20 – 25 years**	**n/a**
Exterior Ground Loop	**n/a**	**n/a**	**75 years +**
Produces Harmful Carbon Emissions	**YES**	**NO**	**NO**
Maintenance			
Yearly inspection	**Yes**	**Yes**	**Yes**
Filter replacement	**2-3 times annual**	**2-3 times annual**	**3-4 times annual**

[a] *It is possible that Natural Gas will be phased out by governments before the Natural Gas system reaches its life expectancy.*

[b] *Greater involvement of congregation in oversight would reduce costs.*

Is Air Conditioning Necessary?

Climate change experts predict that the increase Manitoba has already seen in days above +30 will continue. By 2030, Manitoba is likely to see between 30 and 40 days of 30+ temperature, up from the average of 12 days per year for the period 1951-80. This does not just mean that days in July and August will be warmer, the period of "hot weather" will be extended: essentially summer will begin earlier and last longer.

Communities	Average hottest temperature of the year			Average coldest temperature of the year			Average number of days per year above 25 °C			Average number of below-zero days per year			Average length of the frost-free season		
	Recent Past	Low-Carbon Future	High-Carbon Future	Recent Past	Low-Carbon Future	High-Carbon Future	Recent Past	Low-Carbon Future	High-Carbon Future	Recent Past	Low-Carbon Future	High-Carbon Future	Recent Past	Low-Carbon Future	High-Carbon Future
Winnipeg	34.5 °C	37.8 °C	39.3 °C	-36.0 °C	-31.5 °C	-29.8 °C	55	87	98	189	161	149	127	149	161

Climate Change a factor in the real bottom line

Our awareness of the devastating effects of climate change has grown. The target set by our Government for completely reducing carbon emissions by 2050 means that action needs to be underway now.

Any assessment of the cost of options outlined below should be interpreted with an awareness of the undefined, but very real costs, of continued dependence on fossil fuels.

Being Green Leaders

The Church has a responsibility to uphold God's direction to humanity to tend the earth and all its creatures.

Some governments are stepping up to take leadership, but not all. There is a need for civil society, which includes communities of faith, to fill in where others are abdicating responsibility for leadership.

We are an Easter people. We believe in the power of community to see past death to the hope of resurrection.