

Lunch N Learn Webinar

Geothermal: One faith community's journey to stop burning fossil fuels

May 23, 2019, 12:00pm-1:00pm

Our Presenters: Archdeacon Michael Patterson and parishioner Mac Morrison
Anglican Church of the Incarnation, Oakville, ON

AGENDA

12:00-12:05- Welcome and Land Acknowledgement, Teresa Ierullo

12:05-12:40- Presentation, Michael Patterson & Mac Morrison

12:40-1:00- Questions & Answers

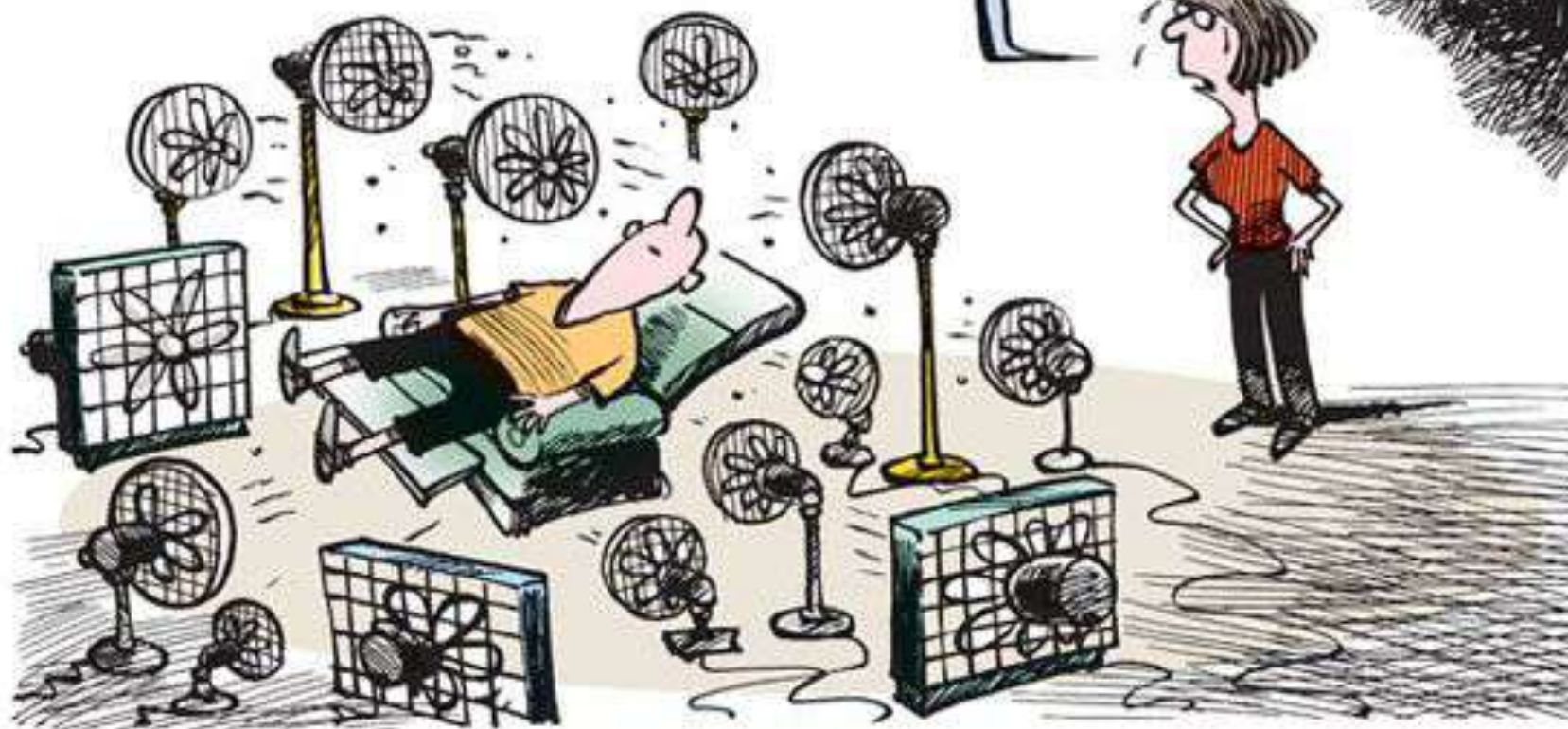
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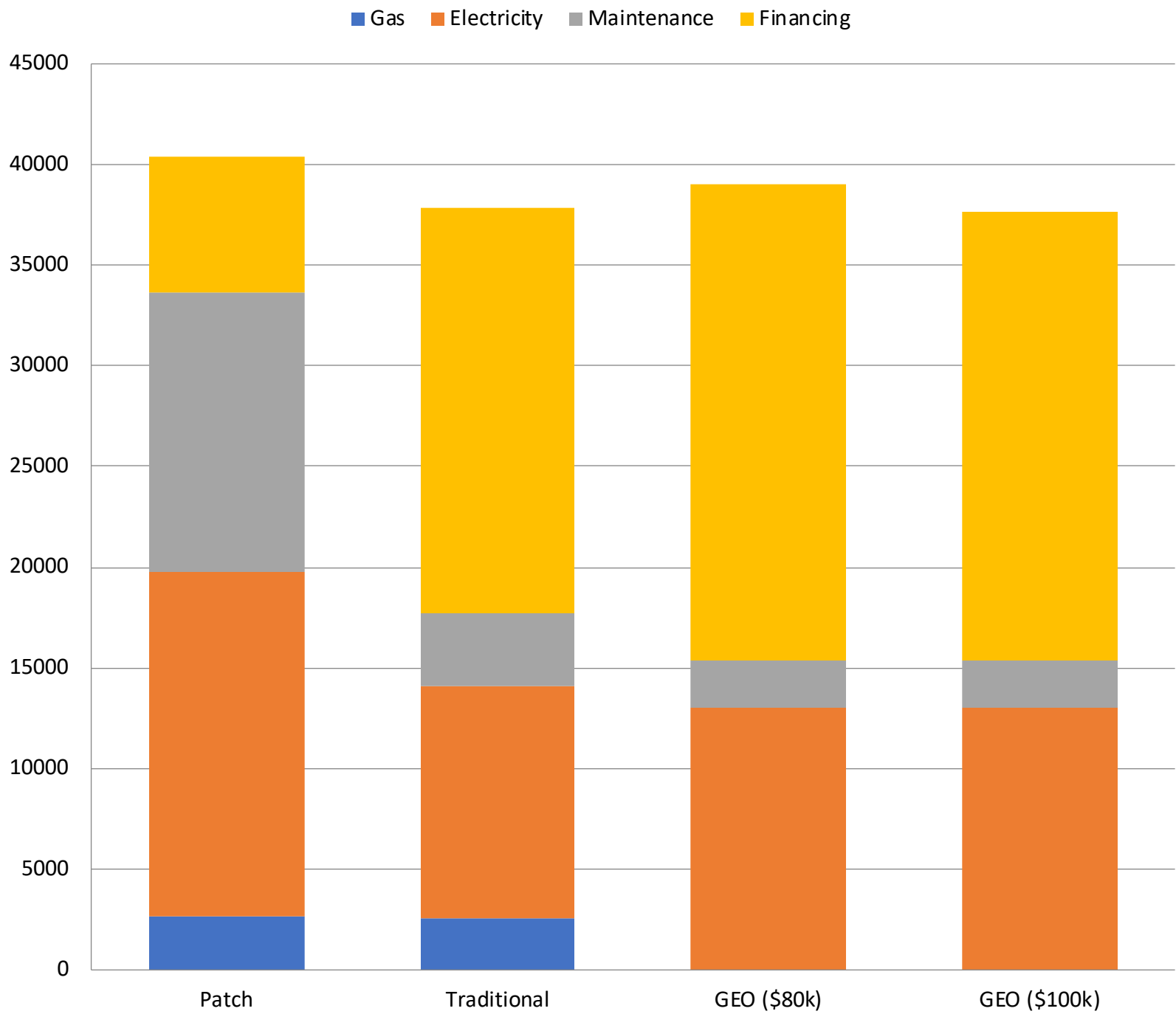


Decision Factors

- Economics – to support any solution financially.
- Risk – a solution that is dependable for us and tenant GACC.
- Green – to support sustainable energy / the environment.
- Longevity of any solution - how soon are we back doing this exercise again?

SO HAROLD, DO YOU
STILL THINK GLOBAL
WARMING IS A HOAX?





ALTERNATIVE #1 – Patch & Repair Equipment Ongoing

- Fix the north HVAC unit (\$7,000) and replace broke AC unit (\$4,500) now and then repair and maintain equipment on an ongoing basis. Baseboard heating and no air circulation for the daycare areas.

Annual Occupancy Cost Report

	Unit	Annual Units Used	Unit Cost (13% HST)	Total 13% HST	Total with 3.94% HST
For 2017					
Natural Gas	M3	11,065	\$0.2318	\$ 2,565	\$ 2,359
Natural Gas Meter Charge	month	112	\$ 23.73	\$ 285	\$ 262
Electricity	KWH	91,238	\$0.2039	\$ 18,603	\$ 17,112
HVAC Contract Maintenance		1	\$ 2,092	\$ 2,092	\$ 1,924
HVAC Repairs			\$ 12,995	12,995	\$ 11,953
Sub-Total					\$ 33,610
Financing Costs*					\$ 6,756

TOTAL \$ 40,366

- Financing costs on the current debt of \$ 99,451 as of Dec 31, 2016
- HVAC Repairs annually expected \$ 5-10,000
- Annual capital provision is \$ 12,943 plus 3.94% HST

Annual cash outlay plus annual capital provision = **\$ 53,819**

Summary

- Repair costs plus large utility costs (with inefficient systems) offset the financing costs of new equipment plus lower utility costs on other alternatives. If equipment is repaired and then replaced in a short period, or electricity or natural gas prices rise, or the tenant is not retained, this alternative fails. This alternative is the least green.

Economics

- 2017 expected annual expense including patch the broken north unit (\$ 7000) and replaced broken AC (\$ 4500) + 3.94% HST) is \$ 40,366 . This is roughly equivalent to the options where ALL new equipment is introduced.

- There are two main reasons for this:

- Our current system is incredibly inefficient – electric baseboard heating, old units throughout, and the in-ground ductwork is losing energy in transfer.
- Costs of repair. It is quite reasonable to expect \$ 5,000 - \$10,000 annually in ongoing repair costs to Band-Aid the system.

The High Risk Option

- The 15 tonne HVAC units and stand alone AC units are at end of life – servicemen are giving no assurances – system can stop working at any time.
- This option is most negatively hit by increases in utility cost

ALTERNATIVE #2 – New Traditional HVAC System Throughout

- Indoor HVAC (natural gas / electricity) units. (likely 8)
- New ductwork in worship area to replace underground.
- New ductwork in the day care areas.
- Ductwork to tie in the office and kitchen areas.
- Baseboard heating and existing HVAC/AC units removed.

Annual Occupancy Cost Report

	Unit	Annual Units Used	Unit Cost (13% HST)	Total 13% HST	Total with 3.94% HST
For 2017					
Natural Gas	M3	10,579	\$0.2318	\$ 2,452	\$ 2,256
Natural Gas Meter Charge	month	112	\$ 23.73	\$ 285	\$ 262
Electricity	KWH	61,592	\$0.2039	\$ 12,559	\$ 11,552
HVAC Contract Maintenance		1	\$ 3,350	\$ 3,350	\$ 3,082
HVAC Repairs			\$ 565	\$ 565	\$ 520
Sub-Total					\$ 17,672
Financing Costs*					\$ 20,190
TOTAL					\$ 37,862

- Financing costs include the current debt & \$ 190,268 at 3.94% HST
- Annual capital provision is \$ 12,943 plus 3.94% HST

Annual cash outlay plus annual capital provision = **\$ 50,315**

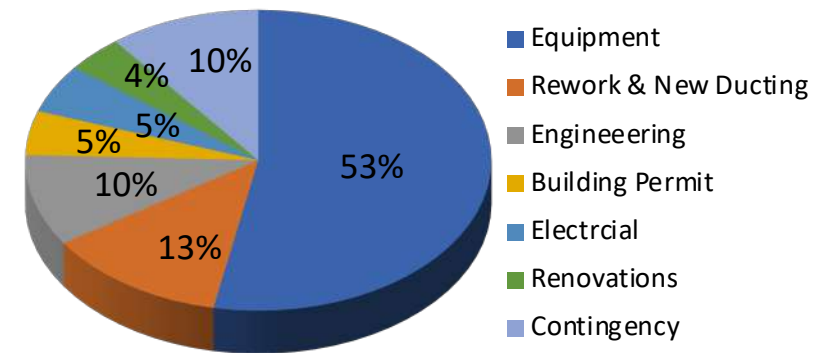
Observations

- Annual costs for all heating, cooling & financing charges (including existing debt) = \$ 37,862. This is a reliable system that will require equipment replacement in 16 years versus 25 for geo-thermal. Economics in line with the other options. Utility expense exposed to natural gas price increases versus geo-thermal. Not a green alternative.

Life Replacement Cost Annual Provision Requirement

	Component Cost (no HST)	Expected Life	Replacement Cost (1.3% inflation)	Annual Provision (no HST)
Equipment	\$ 101,000	16	\$ 124,186	\$ 7,761
Rework & New Ductwork	\$ 24,000	75	\$ 63,229	\$ 843
Engineering	\$ 18,750	16	\$ 23,054	\$ 1,441
Building Permit	\$ 9,018	16	\$ 11,088	\$ 693
Electrical	\$ 10,000	50	\$ 19,075	\$ 382
Renovations	\$ 7,500	50	\$ 14,306	\$ 286
Contingency	\$ 20,000	16	\$ 24,591	\$ 1,537
TOTAL	\$ 190,268			\$ 12,943

* Financing at \$ 190,268 + 3.94% HST = \$ 197,765



ALTERNATIVE #3 – New Geothermal System

- Indoor geothermal units. (likely 6)
- 600 foot vertical drilled holes outside. (likely 6)
- New ductwork in worship area to replace underground.
- New ductwork in the day care areas.
- Ductwork to tie in the office and kitchen areas.
- Baseboard heating and existing HVAC/AC units removed.

Annual Occupancy Cost Report

	Unit	Annual Units Used	Unit Cost (13% HST)	Total 13% HST	Total with 3.94% HST
For 2017					
Natural Gas	M3	0	\$0.2318	\$ 0	\$ 0
Electricity	KWH	69,600	\$0.2039	\$ 14,191	\$ 13,054
Geothermal Maintenance		1	\$ 1,130	\$ 1,130	\$ 1,039
Repairs			\$ 1,356	\$ 1,356	\$ 1,247
Sub-Total					\$ 15,340
Financing Costs*					\$ 23,670
TOTAL		\$ 80,000	campaign		\$ 39,010
TOTAL		\$ 100,000	campaign		\$ 37,651

- Financing costs include current debt & \$ 316,518 + 3.94% HST less \$ 80k/\$100k campaign
- Annual capital provision is \$ 11,521 plus 3.94% HST

Annual cash outlay plus annual capital provision = **\$ 49,626**

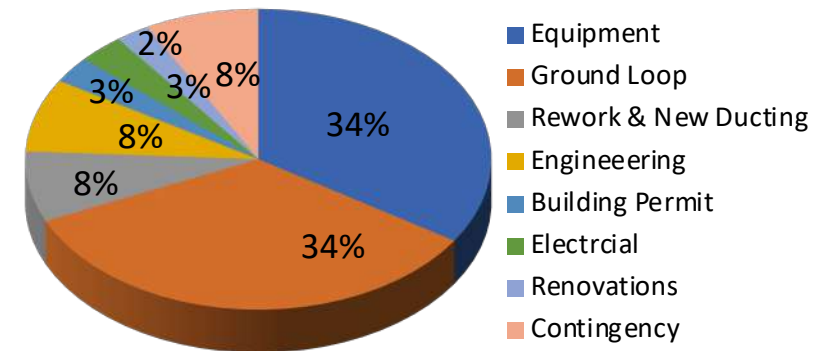
Observations

- This is a reliable system that will require equipment replacement in 25 years versus 16 traditional HVAC. No exposure to natural gas price increases. Slightly more exposure to electricity price increases than alternative #2. Overall this is the lowest expenses for energy costs. This is the greenest alternative.

Life Replacement Cost Annual Provision Requirement

	Component Cost (no HST)	Expected Life	Replacement Cost (1.3% inflation)	Annual Provision (no HST)
Equipment	\$ 108,000	25	\$ 103,585	\$ 4,143
Ground loop (energy source)	\$ 108,000	75	\$ 284,533	\$ 3,794
Rework & New Ductwork	\$ 24,000	75	\$ 63,229	\$ 843
Engineering	\$ 25,000	75	\$ 65,846	\$ 878
Building Permit	\$ 9,018	75	\$ 23,758	\$ 317
Electrical	\$ 10,000	50	\$ 19,075	\$ 382
Renovations	\$ 7,500	50	\$ 14,306	\$ 286
Contingency	\$ 25,000	75	\$ 65,864	\$ 878
TOTAL	\$ 316,518			\$ 11,521

* Financing at \$ 316,518 + 3.94% HST less \$ 80k/\$100k Capital Campaign



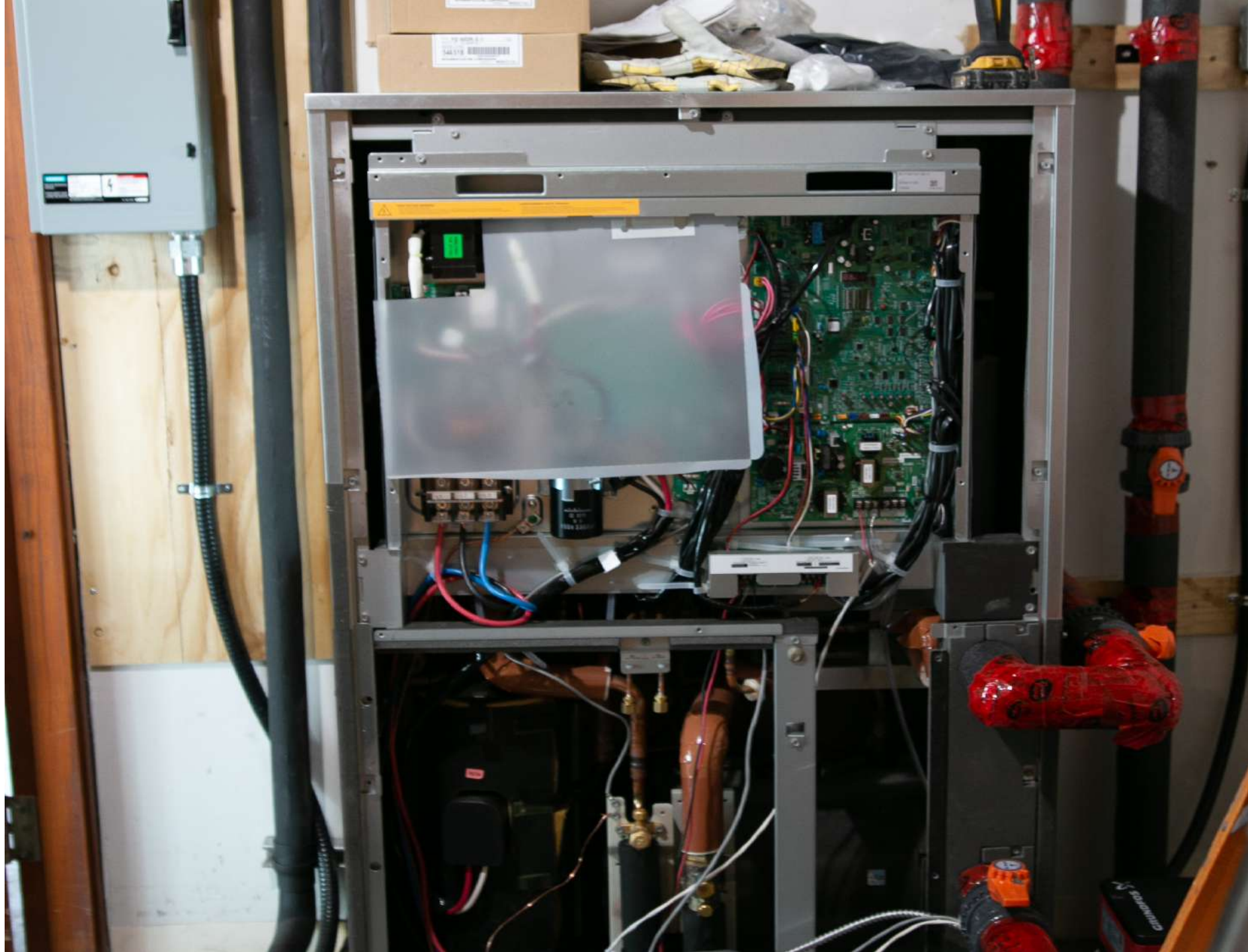




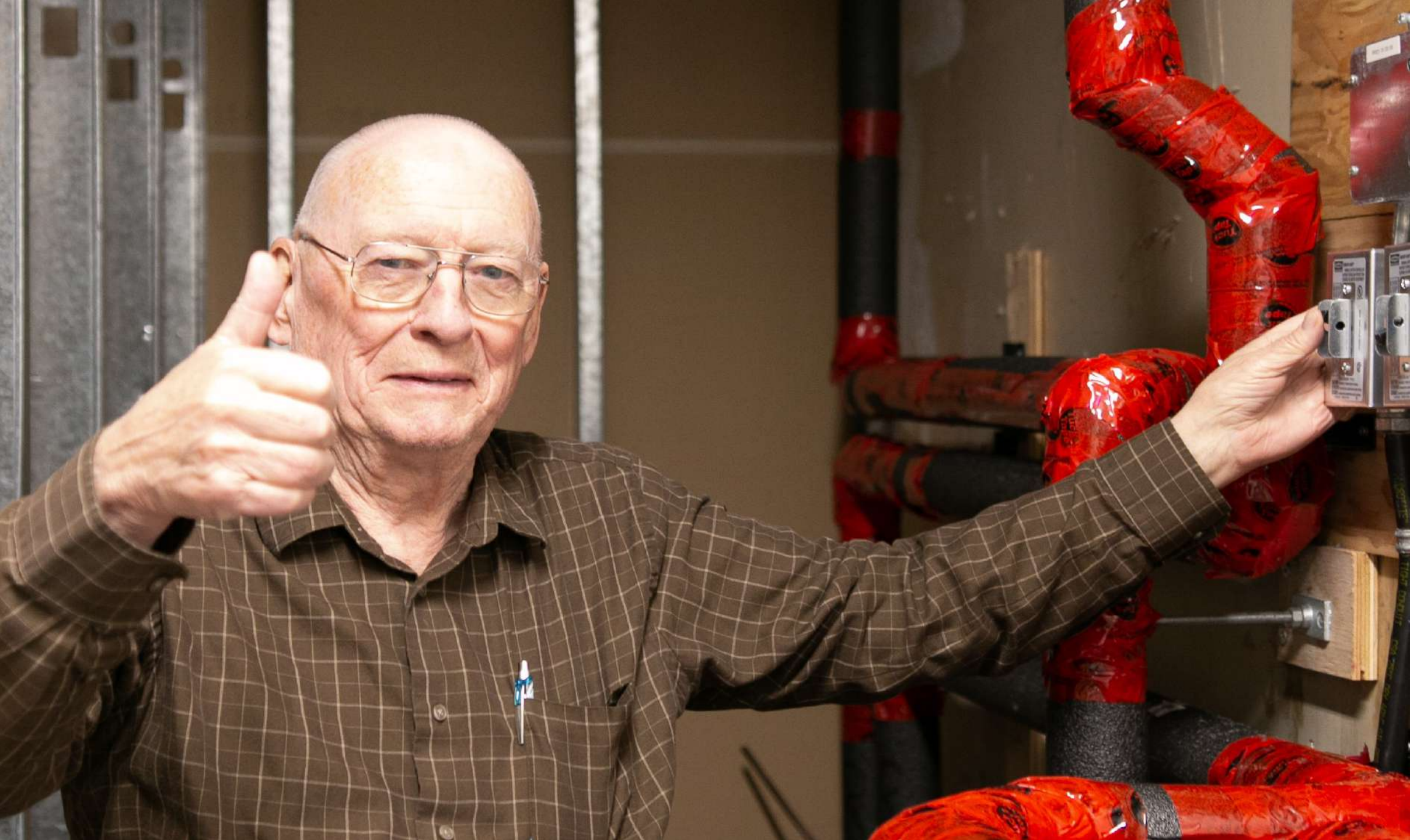












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Thank you!

