

Hall, Renee

From: Dylan Kline <dylan@ameschamber.com>
Sent: Friday, June 21, 2024 3:45 PM
To: City Council and Mayor
Cc: dan@ameschamber.com
Subject: Geothermal Cost Analysis - Baker Subdivision
Attachments: Baker Subdivison Geothermal Cost Analysis.pdf

[External Email]

Mayor Haila and members of the Ames City Council,

I am writing to you this afternoon with additional information to supplement the memo presented to council by the City of Ames Electric Department on the topic of "[Geothermal Installation Costs within the Baker Subdivision](#)" on May 28th of this year. To assist staff in preparation and data collection for this memo, the Ames City Manager requested I, in my role as Economic Development Liaison to the city and as current president of the Ames Home Builders Association, assist staff in coordinating feedback sessions with experienced local residential Heating Ventilation and Air Conditioning (HVAC) contractors that install geothermal systems in our market. I also attended and facilitated discussions for these meetings and collected additional data from these contractors on behalf of staff.

Having attended these meetings and assisted with the data collection for this memo, it was clear to me that there were some key details that were omitted from the staff memo. From my perspective, these data points are essential to your analysis of the efficacy of requiring geothermal for construction of single-family homes in the Baker Subdivision. These points can be summarized in the following categories:

Payback Period:

The "Payback Period" is a common cost/benefit calculation used to estimate the time period a consumer could expect to realize enough savings from their monthly utility bill to overcome the cost premium in a geothermal system. The calculation can be shown as "Geothermal Cost Premium / Estimated Yearly Savings = Payback Period in Years". In this case, the premium of a geothermal system after rebates is \$3,640, and the estimated yearly energy savings is \$212.55. The estimated Payback Period of a system in Baker Subdivision is 17.13 years. The staff memo reported that the expected lifespan of a geothermal system is 15 years. In this application, a geothermal system does not financially benefit the homeowner before the system will likely need to be replaced.

Elevated Repair Costs:

Although geothermal systems have fewer moving parts than a traditional natural gas furnace and air conditioner, the components are far more interconnected with one another and are housed in a more compact cabinet. This not only increases the time it takes to make necessary repairs, but also often requires that adjacent components be replaced along with the part that failed. Additionally, since a geothermal system runs in both heating and cooling mode, the components are taxed year-round. A traditional system, on the other hand, operates the furnace in heating mode and the air conditioner in cooling mode, putting less wear-and-tear on each component. Consequently, the contractors reported that the most common repairs to a geothermal system are replacement of the compressor, expansion valve, reversing valve, and co-axial coil. The estimated cost for these repairs ranged from \$3,000 to \$5,000 each. Most systems carry a 10-year "parts only" warranty. If one of these components fails within the warranty period, the homeowner is still responsible for the labor costs. However, the contractors indicated that these components most typically fail after the warranty period has expired.

According to the 2022 Census Data, the median household income for a family living in Ames is [\\$52,565](#). The fact that the payback period of a geothermal system is expected to extend beyond the overall life expectancy of the equipment., and considering one of the 4 most common repairs to the system could cost in the range of \$3,000 to \$5,000, the requirement of a geothermal system in this application amounts to an ongoing financial burden to families living in a subdivision designed to be some of the most economical new housing in the city. Other all-electric options, such as cold-climate air-source heat pumps, are a more cost-effective application, but also come with a shorter system lifespan and more expensive maintenance and replacement costs. Allowing customers to install a standard high-efficiency natural gas furnace and air conditioner while also implementing a [more rigorous energy modeling system](#) for these homes save the residents money, increase overall comfort in the home, and take a step toward climate action goals for the city.

Thank you for your time and continued attention to this important matter. This is a topic I know none of you take lightly. I hope this new information is useful in your analysis, and I welcome any questions you may have.

Regards,

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