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Sent: Wednesday, August 31, 2022 2:11 PM
To: Planning <Planning@a2gov.org>
Subject: public comment (Village of Ann Arbor site plan)

To the Planning Commission:

I'm writing about the revised Village of Ann Arbor site plan, 1680 Dhu Varren Road. This is an improved plan. The 164 attached single-family homes will now be all electric. Energy efficiency is decent, with the petitioner committing to a blower door test rating of ACH 3 or less. However, this metric falls far short of the current passive house standard of 0.6 ACH. But what makes this plan unacceptable is the use of gas to heat the 320 apartments. Consider these points:

1. Gas vs. electric utility costs. Tim Loughrin of Robertson Brothers, in his August 29 response letter, cites a "gap of 120% to 130% between gas and electric utility costs (Exhibit G)." This is incorrect. The gap is only 20% to 30%. According to exhibit G, for the occupant of a 24' end unit, that difference amounts to \$687 a year, and for an interior unit \$405 a year. Averaged over the course of a year, those translate into additional monthly charges of \$57 and \$34, respectively. (Most units are interior.)

Assuming high-efficiency (10 HSPF, SEER 18) heat pumps, as in Exhibit G, management should lose few if any renters over the \$34 or \$57 average monthly difference in utility bills. And if the petitioner chooses, it could mostly eliminate that difference with rooftop solar on these apartment buildings, and/or passive building construction methods, which apparently were never considered.

2. Natural gas prices. But even those \$34 and \$57 monthly utility increases are inflated. The analysis in exhibit G used DTE's October 2021 gas rate of 0.6677 dollars per therm. As of August 31, 2022, DTE is charging residential gas customers 0.7913 dollars per therm, 19% higher than the old rate. If you plug current gas prices into the model, the difference between gas and electric mostly disappears. They're essentially at parity.

3. Up front costs. Mr. Loughrin also writes, "The upfront cost of this system is substantially more than a traditional natural gas furnace." High efficiency heat pump systems can be more expensive to install than gas furnaces. But a 2020 Rocky Mountain Institute analysis of the Minneapolis market found rough parity: <https://rmi.org/insight/the-new-economics-of-electrifying-buildings/> Any difference is likely insignificant in the context of overall construction costs. Note that the heat pump also serves as an air conditioner, so there's no need for separate air conditioning units, or ductwork.

4. Carbon emissions: Mr. Loughrin's August 29 letter cites inaccurate statistics for greenhouse gas emissions. His Exhibit F shows heat pumps producing as much as 50% more CO2 emissions than gas furnaces, owing to DTE's dirty fuel mix for electricity generation and the high energy density of gas, which translates to reduced operating time for furnaces compared to heat pumps. But these figures assume low-efficiency heat pumps (8.5 HSPF, SEER 14), which shouldn't be on the table. And, critically, Mr. Loughrin's consultant is apparently only calculating direct CO2 emissions from gas combustion, without considering upstream CO2 and methane emissions from fracking. Though methane leakage during extraction and transportation averages only about 5%, infrared energy absorption by methane (and its greenhouse effect) is 86 times that of CO2 over a 20-year period. So one must account for methane leakage, as well as upstream CO2 emissions from fracking operations, when calculating climate impact. This more than doubles the emission impact of natural gas combustion alone. (See Robert Howarth et al., "Methane and the greenhouse gas footprint of natural gas from shale formations," *Climatic Change* 106, 2011). Taking everything into account, an electric heat pump in Ann Arbor currently produces 35% lower emissions than a gas furnace, not 50% higher. (Calculation available upon request.)

5. A clean grid. Finally, the city's A2Zero climate action plan calls for powering the local electric grid with 100 percent renewable energy by 2030. When that's accomplished, heat pumps will be almost emission-free, while the Village's gas furnaces will continue to heat the planet, probably through the end of the century.

Conclusion: The additional operating costs of electric versus gas, at current gas prices and assuming high efficiency heat pumps, are minimal, and the up-front cost differences are negligible. Burning gas in these 320 apartments would be a severe setback to the A2Zero plan. Conversely, the climate benefits of full electrification would be immediate.

Thank you for considering these comments.

Respectfully,

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