Staff Report

NEIGHBORHOOD GEOTHERMAL PILOT PROJECT FOR 321 STATE AVE

May 26, 2020

BACKGROUND:

Ames residents and City Council have expressed interest in both environmental sustainability and improved affordable housing options in the Ames community. Ground source heat pumps are highly efficient and reduce both emissions and operating costs of home heating and cooling.

Despite its advantages, ground source heat pumps have seen slow adoption because they have a large incremental up-front cost and provide a slow return on investment (10-27 years which is a difficult kind of investment for most, and especially difficult for low-income homeowners. Utilities, however, are accustomed to large and long-term investments.

Ames Electric Services is interested in participating in a pilot project to install neighborhood geothermal infrastructure to serve heat pumps in the City's affordable housing project at 321 State Ave. The ground source heat exchanger would provide space heating, air conditioning, and water heating to all of the homes in the development. **With this project structure, both the appliance cost and ongoing cost of utility bills for the homeowners will be similar to a conventional heating/cooling/hot water system.** The system will reduce HVAC energy consumption by 57%, and emissions by at least 20%.

Installing a community ground source heat pump system at 321 State St is a unique opportunity for Electric Services because the City of Ames is acting as the developer of the neighborhood. Owning and operating a community ground source heat pump system will provide valuable insight into the actual cost of service of ground source heat pump systems, their impact on our electric system, and the effectiveness of ground source heat pump equipment in demand response programs. With this information, Electric Services can develop more effective methods of incentivizing ground source heat pump technology adoption among our customers and integrating the technology in a way that makes our grid more reliable and efficient.

Initial studies indicate that the project has a cost-benefit ratio of 2.25 and net present value of $121,129 to Electric Services. The initial investment is expected to be between $230,000 and $250,000, which would be paid from the existing Demand Side Management budget. Customers who use the system would pay an average customer charge of $5.25 per month, with expected rate increases of 5% every 5 years. The

expected return on investment from the project would occur in year 23, with a project lifetime of at least 50 years.

On April 27, 2020, the Electric Utility Operations Review and Advisory Board (EUORAB) discussed the proposed project and recommended that Electric Services proceed with developing a Request for Proposal for the system.

STAFF COMMENTS:

Staff is working with Design Engineers of Cedar Rapids to develop a Request for Proposal for construction of the system. Staff will return to Council in the coming weeks for approval to issue a Request for Proposal. Once bids are received, the staff will provide to the City Council a more accurate estimate for the cost/benefit from installing a geothermal system. After receiving this information, the City Council will need to make a final decision on whether or not to pursue this pilot program or to develop our affordable housing subdivision with separate heating and cooling systems for each housing unit.