

## Community Heat Pump Systems Planning Challenges Q&A Report:

Question Asked	Answer
How many community heat pump systems exist in North America?	Answered during the webinar.
Is there a concern that the acronym CHPS will be confused with Combined Heating and Power Systems?	Agreed this is unfortunate, but we have adopted this terminology to be consistent with that in use by NYSERDA.
Do you think most Community (electric) Heat Pump systems will have insulated pipes between buildings and the various sources and sinks for thermal energy (or storage)?	Answered during the webinar.
In a residential/retail/office complex how do you expect the trend in working from home to effect demand loading as it relates to plant sizing. Use to be able to assume residential peak would be different than retail/offices	Only a detailed analysis of the loads will provide insight to this question and if it will be an issue for any particular project.
Isn't it difficult gain financial backing for a community project when the process is more and art than science? Seems a challenge to me.	Answered during the webinar.
Thank you for introducing these useful documents. Is there any sort of report for the performance reliability assessment of heating and cooling equipment (including pumps actually)?	Answered during the webinar, see Chapter 38 of the 2019 ASHRAE Handbook - HVAC Applications. Also be aware of the cautions placed on the use of the information as presented there. There was also some research done by Caneta Research in 1995 (ASHRAE TRP-863) called, "Commercial/institutional ground-source heat pump systems."
How do you handle hot spots on the loop. Areas where its very difficult to put equipment or bore fields, but you have a large concentration of buildings and people. Increase the loop flow based off delta T?	It will vary depending on the configuration of the piping system (for one-pipe it will be difficult) and the degree of imbalance. Such a system may not be a good candidate for a CHPS. A satellite district cooling plant, interconnected to the CHPS, might be one approach.
Could you provide a link or title for the referenced study of high(er) temperature heat pump systems in Europe?	Andrei, D., B. V. Mathiesen, H. Averfalk, S. Werner and H. Lund. <i>Review: Heat Roadmap Europe: Large-Scale Electric Heat Pumps in District Heating Systems</i> . <i>energies</i> 2017, 10,
One barrier to planning challenges is upgrading existing steam and high temp hot water systems. Getting visibility on the district heating network condition can be challenging. Are there established standards or guidelines on assessing the condition of what you have in order to prioritize upgrades and modernization efforts?	Where existing district heating systems are to be used in whole or in part, condition assessment will be essential before proceeding. While there are some tools such as infrared thermography that may be of use, a detailed examination of the O&M records as well as the system itself where possible (manholes, tunnels, building entries, etc.) should be made by a firm with expertise in these systems.
Please provide acronym glossary	AHJ = Authority having Jurisdiction CAD = Computer-aided design CHPS = Community Heat Pump Systems CIBSE = Chartered Institute of Building services Engineers DC = District Cooling DCS = District Cooling System DES = District Energy System DH = District Heating DX = direct expansion EMS = Energy monitoring/control system FTE = Full time equivalent IDEA = The International District Energy Association IEA = International Energy Association LHD = Line Heat Density O&M = Operations and Maintenance SOW = Scope of Work
It was mentioned that CO2 heat pumps can produce 180 F to 190 F, but there was no mention of entering water temperatures. Please shed some light so it is practical to our old NYS upstate buildings.	By entering water temperature I assume you mean on the source-side of the heat pump. Ambient level temperatures are possible and have been used, see the paper referred to in the answer to Question on line 12 above.
It was mentioned that both CO2 and Ammonia and they are environmentally friendly refrigerants to produce high temperatures, but what is the vision regarding Propane refrigerant to produce high temperatures.	We are unable to comment beyond the fact that the paper referred to in the answer to Question on line 12 above does not list propane as a refrigerant that was used in any of the 149 systems they surveyed. This would tend to indicate that in the past at least, the concerns over its flammability have discouraged its use.