



CampusEnergy2021

BRIDGE TO THE FUTURE

Feb. 16-18 | CONNECTING VIRTUALLY

WORKSHOPS | Thermal Distribution: March 2 | Microgrid: March 16

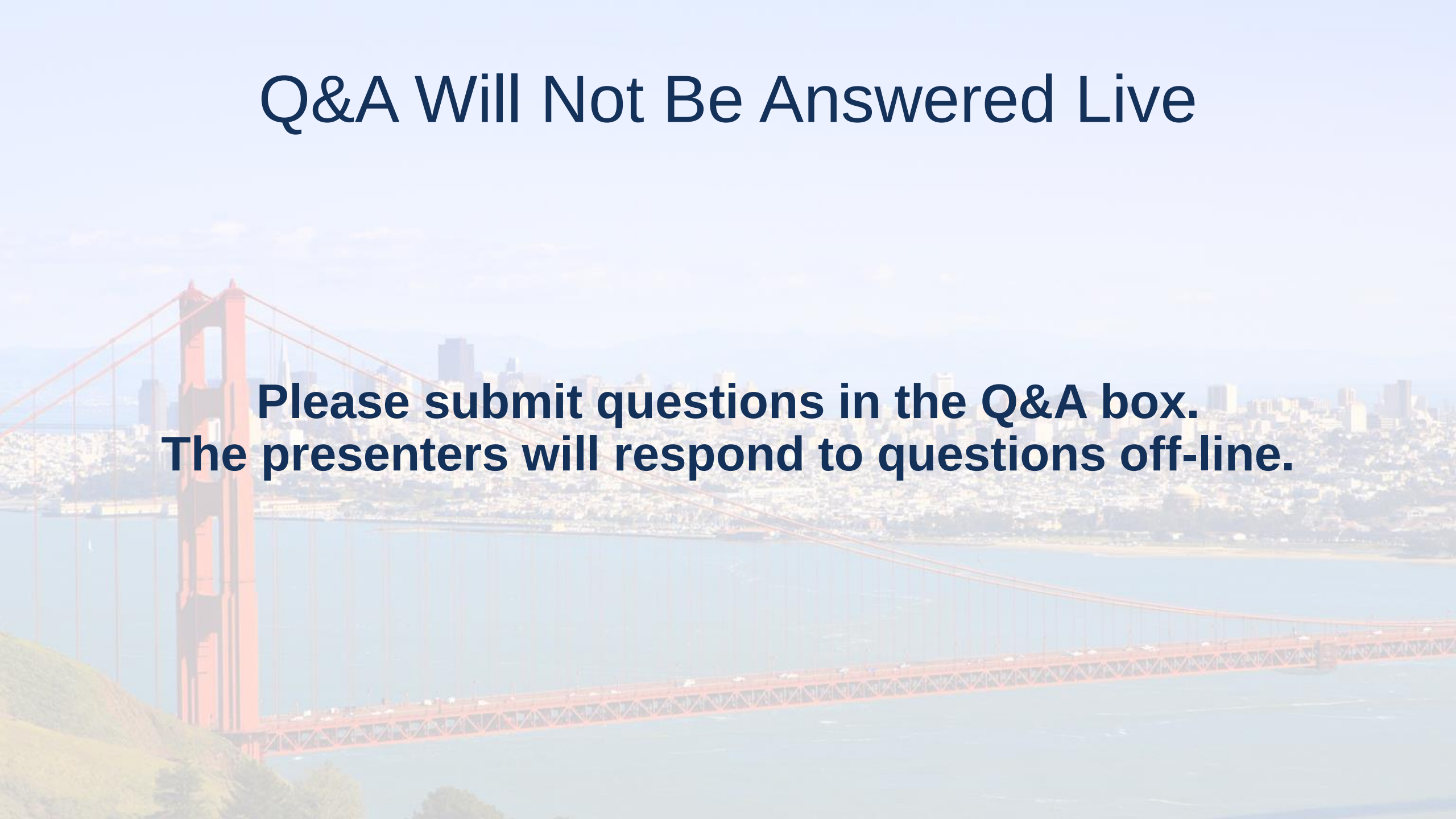


Identifying Opportunities for Clean District Energy Campuses in New York City

David Jones, ICF

Q&A Will Not Be Answered Live

**Please submit questions in the Q&A box.
The presenters will respond to questions off-line.**



ICF NYC 80x50 Decarbonization Study - How Can District Energy Reduce Carbon Emissions?

- Two components of study

1. Decarbonizing the Con Ed steam loop

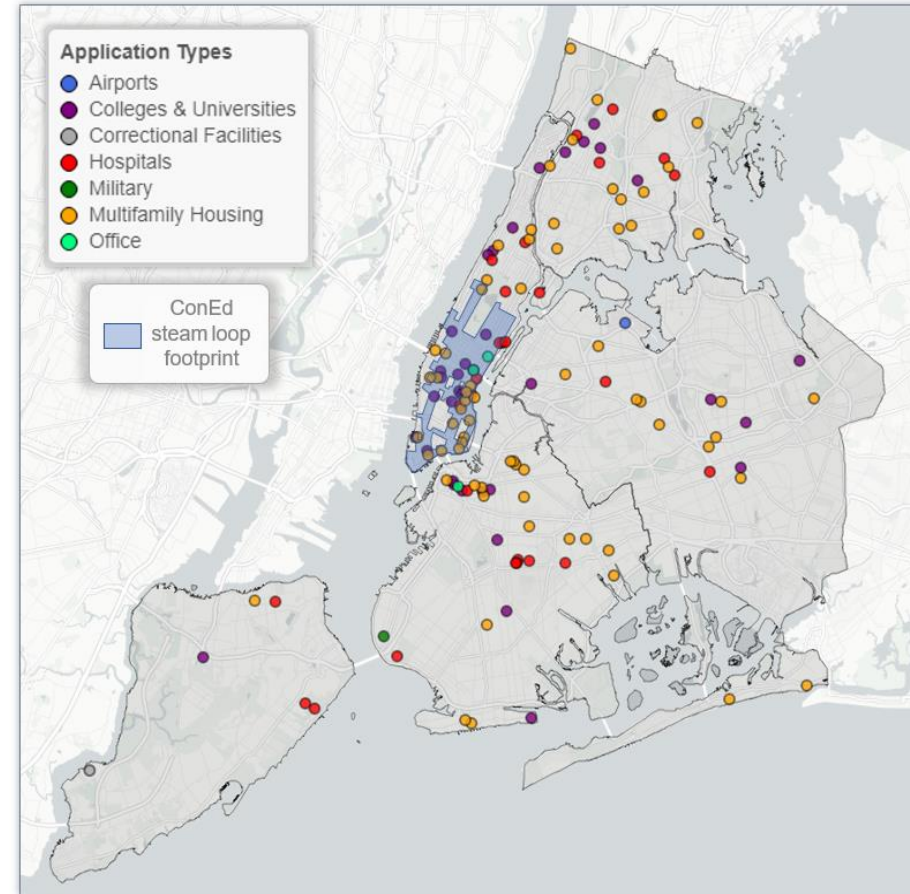
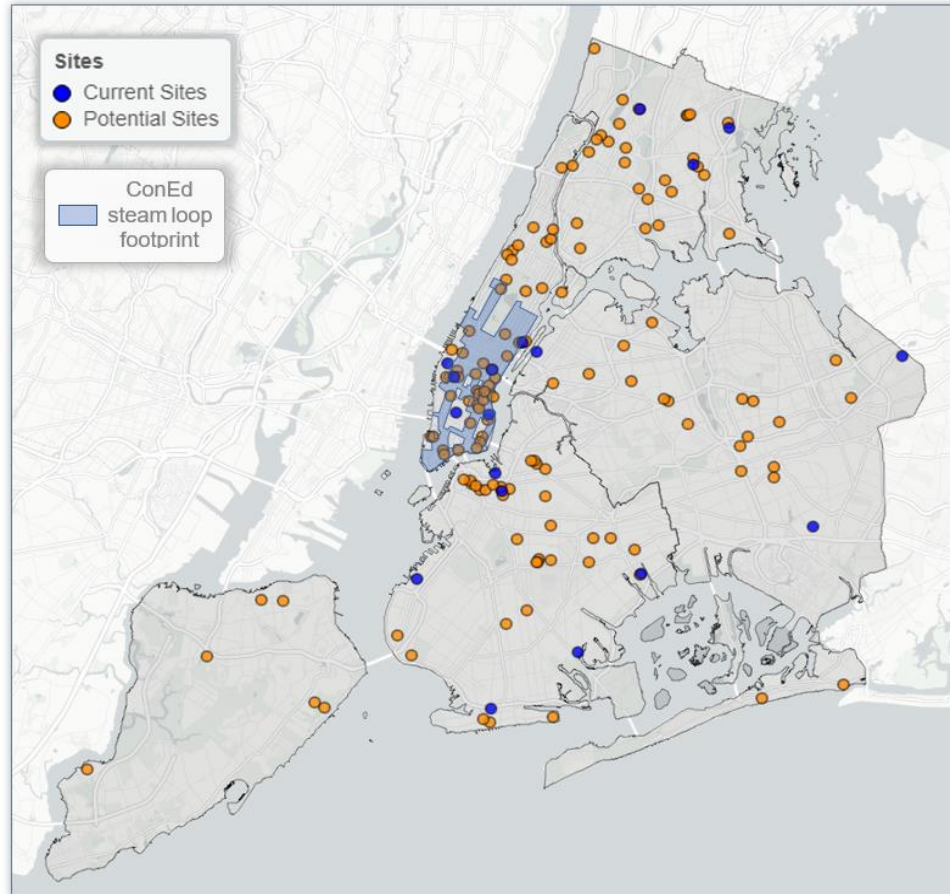
- a) Electrification (building heat pumps + electric boilers)
- b) Renewable natural gas, increased reliance on CHP

2. **Opportunities for clean district energy at NYC campuses**

- a) Geothermal heat pumps – *where can they be deployed?*
- b) Combined heat and power – *potential to reduce emissions?*
- c) Other district energy technologies

Identify NYC Campuses with DE Potential

ICF CHP Technical Potential Database, NYC Benchmarking

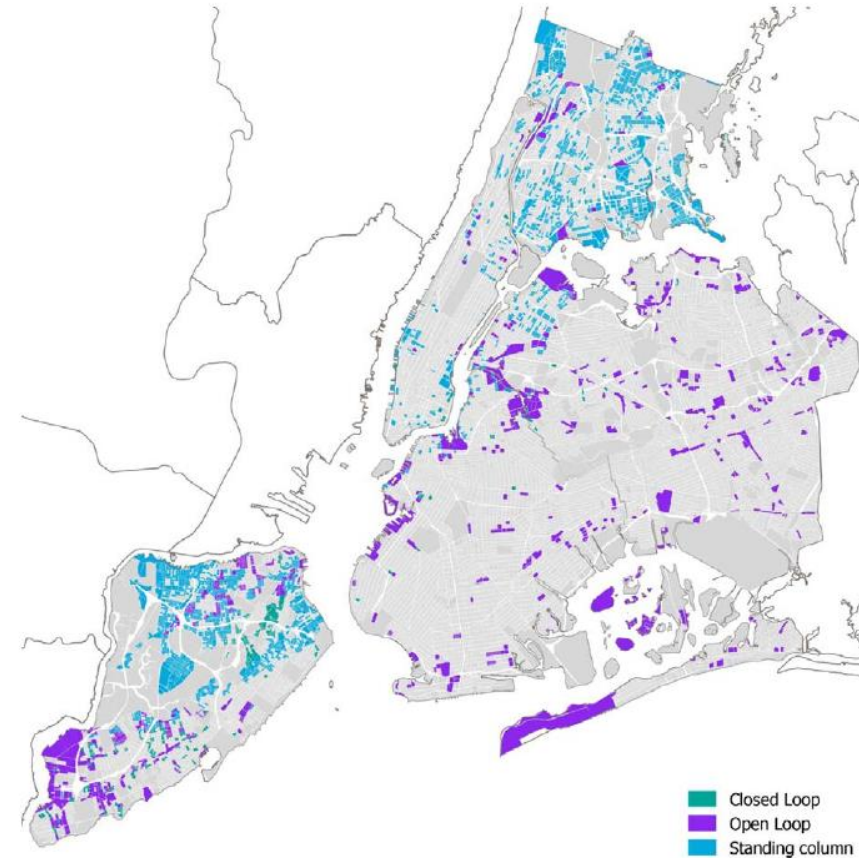
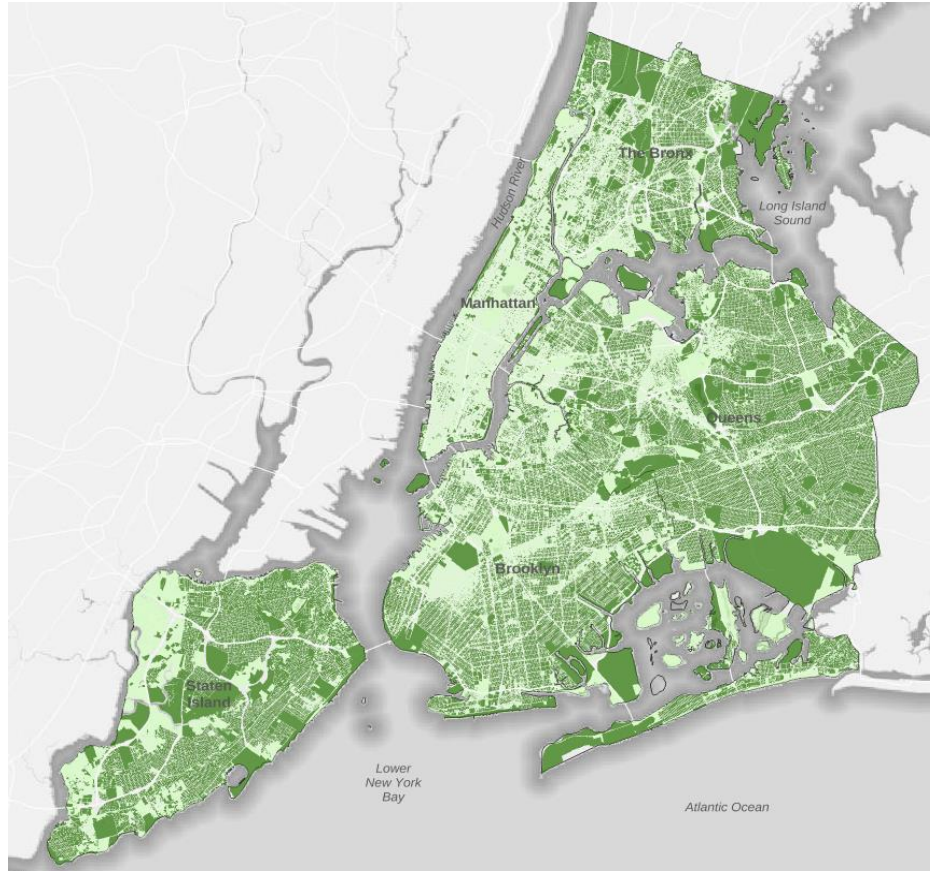


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Overlay with Geothermal Resource Mapping

NYC Geothermal Web Tool, Burrohappold Engineering Study

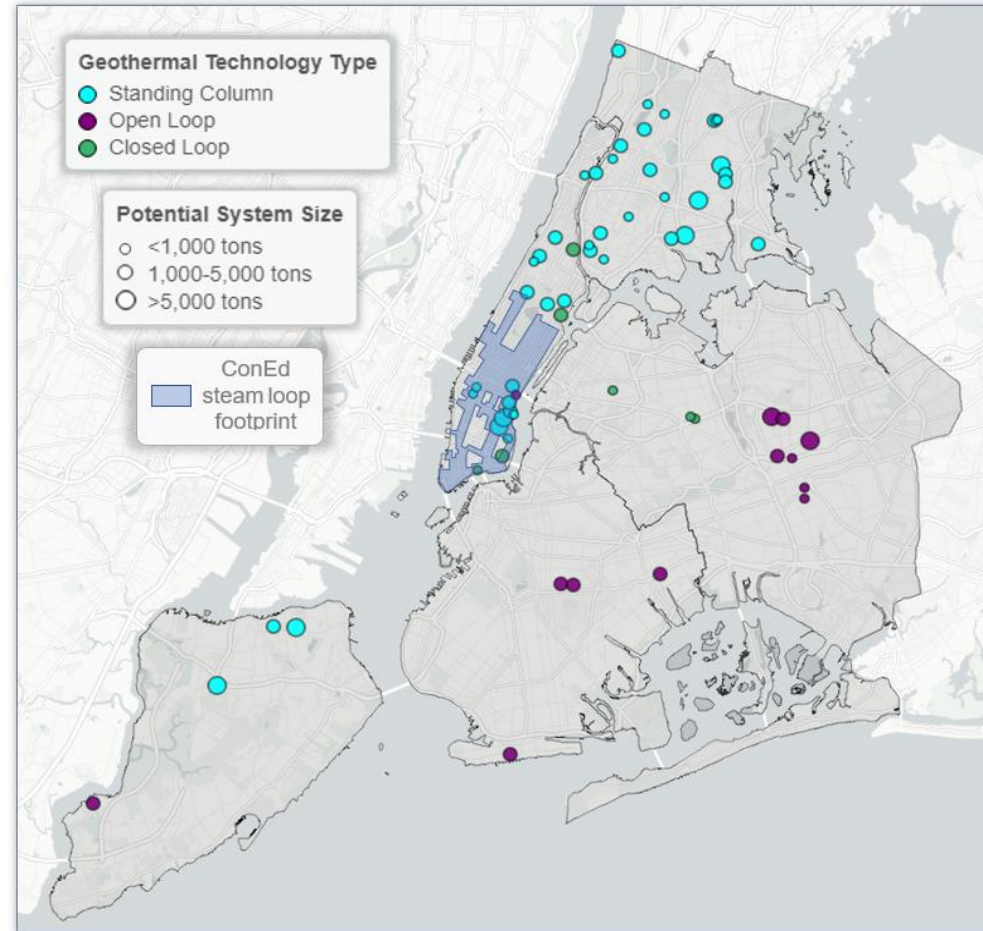


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NYC Campuses with Geothermal DE Potential

- 63 campus sites with geothermal potential
- Campus loads expected to exceed geothermal output
- Can incorporate CHP for DHW and additional space heating loads



Results Incorporated into NYC 80x50 Pathways

- Ground source heat pumps using geothermal energy can efficiently deliver clean heating and cooling to campus buildings
 - Meets electrification and decarbonization goals
 - Zero on-site emissions
- Options to serve remaining heating and cooling loads
 - Traditional DE equipment (central boilers and chillers)
 - Combined Heat and Power
 - Single-building solutions (air source heat pumps)
- Potential for RNG to decarbonize boilers, chillers, CHP



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