Accelerating Decarbonization with District Energy:

Vicinity Energy’s Rapid Electrification Plan

June 21, 2022
Vicinity Energy: Net Zero Carbon by 2050
Leveraging Existing Infrastructure, New Technologies and Renewable Energy Sources to Decarbonize the Building-energy Sector

District Energy has a 100-year history of greening and Vicinity will deploy innovative technologies to achieve *net zero carbon emissions by 2050... Cutting our emissions in half by 2035*. 
Vicinity's Assets Have the Reach to Take a "Big Bite" out of Carbon Emissions

- 65+ million square feet of buildings served
- All downtown hospitals, life science, civic / commercial
- Existing 26-miles of robust underground energy delivery piping
- 2 central plants poised for electrification
- Potential to avoid 800,000 metric tons/year
Vicinity Electrification Strategy and Execution Plan:

Case Study Boston and Cambridge
District Energy Can Eliminate New Gas Boilers in Cambridge

“Natural gas…has no place in a clean energy future.” – Mothers Out Front

New gas boilers in Cambridge will:
- "lock in" an emissions profile; they cannot become greener
- generate unmonitored emissions and pollutants
- degrade from their theoretical efficiency over time
- negatively impact Environmental Justice populations

A hybrid design of heat pumps + eSteam™ = low carbon energy supply to buildings that eliminates new gas boilers

vicinity
District Energy Systems Evolving as the State Encourages More Off-Shore Wind

- A shift to renewable power is coming
- District energy systems will meet this shift through electrification of our core steam generating assets
- Source renewable power, electrically generate thermal energy and convey this energy to customers through existing delivery system
- Maintain Kendall CHP as blackstart and dispatchable asset for the New England electric grid.
Vicinity is Electrifying…\textbf{NOW}

Our \textbf{Phase I} decarbonization plan includes electric boilers, industrial-scale heat pumps, & thermal storage.

\begin{itemize}
  \item **Electric Boilers**
  \begin{itemize}
    \item 50 MW
  \end{itemize}
  \begin{itemize}
    \item 2021/22 –
      \begin{itemize}
        \item 50MW electric boiler (120,000 lb/hr)
          \begin{itemize}
            \item In final design
            \item Equipment being sourced
          \end{itemize}
        \item Filing process with ISO-NE in process
      \end{itemize}
  \end{itemize}

  \item 2024 –
    \begin{itemize}
      \item Installation of electric boiler at Kendall Station
      \item Connected to existing high-voltage transmission lines
      \item Heating produced will be from net zero/renewable power
      \item End state – up to 300 MWs of electric boilers
    \end{itemize}

  \item 2025 –
    \begin{itemize}
      \item Plan to install largest heat pump complex in MA
      \item Use heat “lifted” from the Charles River to make steam
      \item Dramatically reduces our carbon footprint in the near term
    \end{itemize}

  \item **Heat Pumps**
  \begin{itemize}
    \item 10 MW
  \end{itemize}
  \begin{itemize}
    \item 2021/22 –
      \begin{itemize}
        \item 3rd party design nearly complete
        \item Issuing a request for proposal (RFP)
      \end{itemize}
  \end{itemize}

  \item **Thermal Storage**
  \begin{itemize}
    \item 1,000 MWh
  \end{itemize}
  \begin{itemize}
    \item 2021/22 –
      \begin{itemize}
        \item Approved for Network Service with ISO-NE
        \item ISO-NE interconnection in process
      \end{itemize}
  \end{itemize}

  \item 2025/27 –
    \begin{itemize}
      \item Provide 1,000 MWh of storage
      \item Mitigate cost and carbon content of electrical peaks by “peak shaving”
      \item Aligned with winter offshore wind peak
      \item Dramatically lower cost of electrified steam, driving adoption
    \end{itemize}
\end{itemize}
Achieving Net Zero: Significantly Reducing Emissions by 2035

Vicinity's carbon footprint will dramatically drop as we consume renewable power to generate “eSteam”
Vicinity’s eSteam™ … the future of district energy renewable thermal is emerging now!

We are bringing *renewable thermal and energy storage* assets to Cambridge

- Leverage existing electric transmission interconnect to access wholesale market-priced renewable power
- Convert renewable power to steam through highly efficient technologies at scale
- Leverage existing status as wholesale grid customer to access real-time energy
- Purchase of renewable power can be customer-controlled or Vicinity-supported
- Customers can use Vicinity’s eSteam™ to achieve their net zero goals at their own pace

Electrification of district energy may be the easiest and most cost-effective path to net zero for all of Center City buildings!