

District Energy with Combined Heat and Power Plant *Saint Paul, Minnesota*

Estimated Annual Savings

- 280,000 tons eCO₂
- \$32 million to customers vs. operating their own heating and cooling systems (continues to grow with price of natural gas)
- Total production capacity of 1,293,000 MMBTU combined heat and power at ~100% efficiency

District Energy Saint Paul owns and operates the largest hot water district heating system in North America, in addition to a large chilled water cooling system. District Energy brings green energy to downtown buildings from a new combined heat and power plant fueled by wood waste.

District Energy Saint Paul currently provides heating service to more than 170 buildings and 300 single-family homes, representing over 29 million square feet of building space, or 80 percent of Saint Paul's central business district and adjacent areas. District Energy continues expanding service areas well beyond downtown every year.

Buildings connected to a district heating system do not need boilers and auxiliary equipment, freeing up valuable space for other uses. Each building has its own heat exchanger and control valve, which transfers thermal energy from the district heating system water to the building's heating system water. Cooled water is then returned to District Energy's main plant to be reheated and circulated once again to buildings connected to the system.

District Energy St. Paul uses wood chips, natural gas, oil or clean-burning coal to fuel its district heating and cooling systems. With the April 2003 startup of an on-site wood-waste-fired combined heat and power facility, managed by an affiliate, the company has reduced its reliance on coal and oil by 80 percent and its soot (particulate) emissions by 50 percent. This produces significant environmental benefits and helps the community solve a local wood waste disposal problem. Efficiency gains over the previous steam heating system allow District Energy to heat twice the building space with the same amount of fuel, and the closed-loop distribution system has eliminated the use of groundwater for heating and cooling. The district cooling system utilizes two chilled water storage tanks which produce chilled water at night using off-peak electricity for daytime distribution to customers.

District energy systems can offer many environmental benefits. They increase energy efficiency; reduce greenhouse gas emissions and other air pollution; decrease emissions of ozone-depleting refrigerants; enhance fuel flexibility; facilitate the use of renewable energy; and help manage the demand for electricity.

Saint Paul Cogeneration, the wood-fueled combined heat and power (CHP) plant that provides heat to District Energy Saint Paul and electricity to Xcel Energy, and the largest wood-fired CHP plant serving a district energy system in the United States, won the 2005 Minnesota Environmental Initiative Award in the Energy category.

Energy Charges: District Energy vs. On-Site

