The University of Minnesota saves approximately $3 million annually as a result of district cooling, which involves connecting multiple buildings to a larger chiller plant rather than running stand-alone units in individual buildings. Money is saved through:

- Reduced maintenance costs
- Operational efficiency
- Fuel flexibility
- Capital cost avoidance

Maintenance costs for central chiller plants are lower because there are fewer chillers with parts that break, locations to visit and hours needed to maintain them, versus servicing stand-alone units scattered throughout campus. The larger units run more efficiently, which in turn requires less fuel. They are powered through central steam plants capable of burning a variety of different fuels, allowing the university flexibility to choose the most economical fuel. And while the initial capital costs are higher, a central system allows future buildings to be added for a fraction of the cost needed for an individual building unit.

Since 2000, the university has renewed efforts to connect all Twin Cities Campus buildings to district cooling. Currently, the campus is served by a variety of cooling systems, ranging from window air conditioning units to district cooling plants chilling dozens of buildings through expansive piping loops. Some buildings have small and aging cooling equipment, while others have no air conditioning at all.

The ultimate goal is to cool as many university buildings as possible using chilled water loops. These loops feature pipes that run under the streets and through buildings circulating cold water through cooling coils to remove heat from the air. The resulting warmed water returns to industrial sized air conditioners called chillers that remove the heat from the water and discard it outside.

Aging Infrastructure

By 2007, more than 40% of campus chillers had been in operation longer than the recommended lifespan of equipment. Replacing cooling systems quickly became a priority and district cooling systems help make these changes sustainable.

Success Story

District Cooling

Estimate Annual Savings $3,000,000
Action Plan

District cooling systems were introduced to the Twin Cities Campus in 1966 as it expanded to the West Bank. The concept continued in the Health Sciences expansions from 1971-1978, but then fell out of favor. As part of the Campus Master Plan submitted in 1988, Facilities Management prescribed integrating a series of district cooling systems. Implementing this long-term plan has been a tremendous undertaking for Facilities Management. When setting up a district cooling system, chilled water pipes need to be connected from the buildings to the central district cooling plants, which must also be commissioned to ensure optimal efficiency and reliable operation. During the course of replacing aging campus cooling infrastructure, more than 120 individual chillers will be decommissioned and replaced with about a dozen district cooling plants.

Campus Cooling Systems

There are several district cooling systems in place. If the remaining 10,740 tons of stand-alone equipment were connected to district cooling, an additional $500,000 of annual maintenance could be avoided.

Health Sciences (12,500 ton district cooling system with two plants) - Most recently upgraded with additional capacity in 2011, the Health Sciences district cooling system serves 3.4 Million Gross Square Feet (GSF) in twelve buildings.

St. Paul (7,000 ton district cooling system with two plants) – In a project that was phased-in between 2004 and 2010, this district cooling system replaced 34 isolated building cooling systems. The system serves 30 buildings comprising 2.5 Million GSF and has capacity for additional future structures/buildings.

East Bank (7,276 ton district cooling system with three plants) - By 2013, 29 East Bank buildings occupying 3.6 Million GSF will be served by district cooling. Current East Bank plants are at or near capacity with a 60% projected increase during the next x years. New construction and major renovation projects will require adding more capacity, likely through the CHP project.

Athletic District (1,000 ton district cooling system and plant) - FM assisted Athletics in studying and redesigning an existing stand-alone chiller plant in

Mariucci Arena into a district cooling plant serving TCF Bank Stadium, Mariucci Arena and Ridder Arenas. The redesign reduced maintenance and capital costs, while still meeting peak game-day loads.

Gateway District (2,700 ton district cooling system and plant, expandable to 4,000 tons) - Currently being constructed in the Cardio-Cancer building and scheduled for completion in 2013, this district cooling system will interconnect and provide redundancy for the research buildings along 6th Street SE. The plant is sized to be an anchor point and will operate in parallel with the existing plants in the McGuire Translational Research Facility and Wallin Medical Biosciences Building.

West Bank (5,000 tons district cooling system with four plants) – Currently serving 2.2 Million GSF in 15 buildings, the existing district cooling systems remain with excess capacity. There are preliminary plans to utilize this capacity to connect the last three stand-alone buildings south of Washington Avenue with potential so save in excess of $200,000 per year.