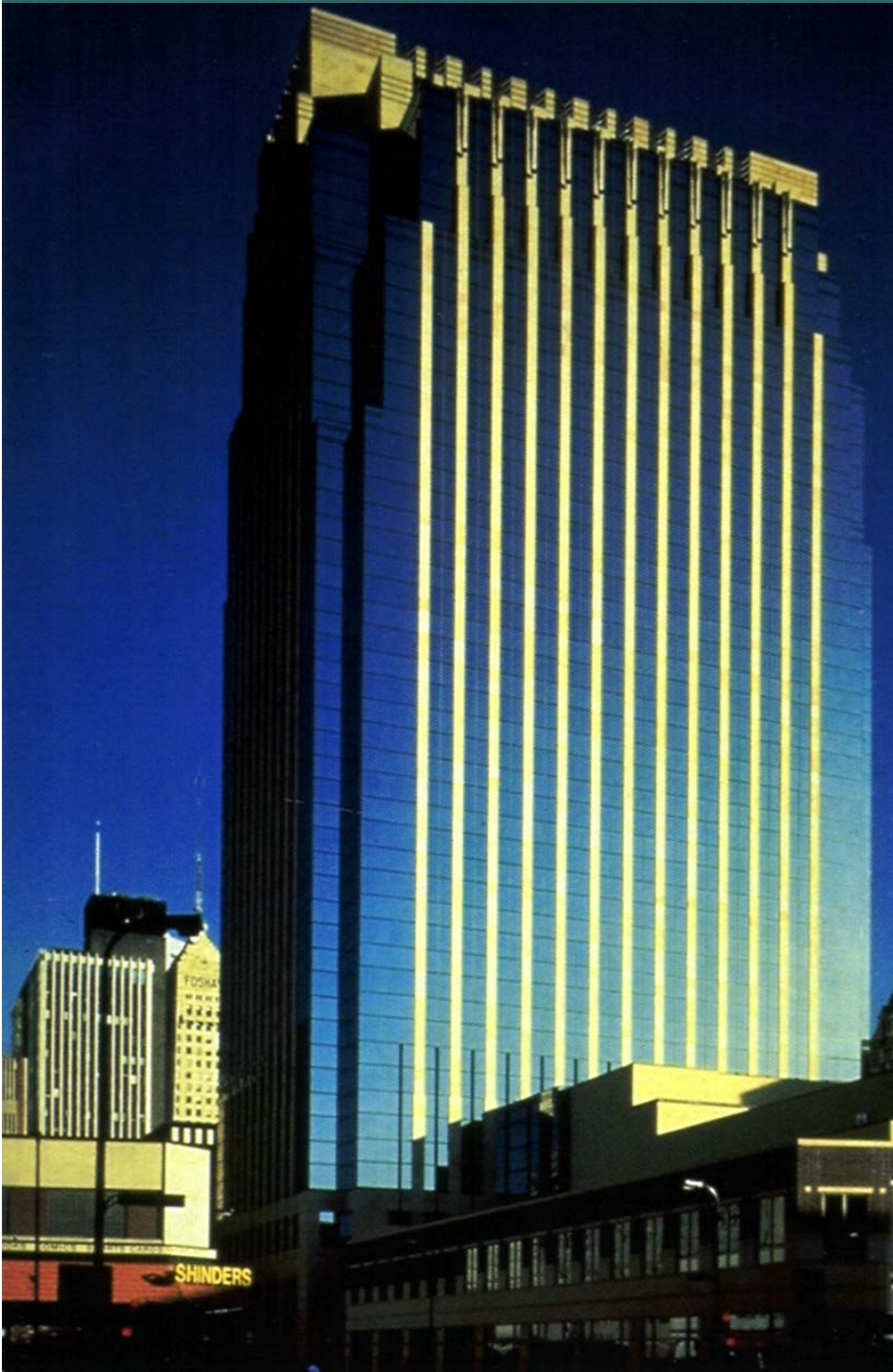


High-Rise Office Building

Reduces annual energy costs 15%, achieves less than a One month ROI and improves tenant comfort.



Case Study

**Class A Office Building,
Minneapolis, Minnesota:**

Improved tenant comfort.

Reduces annual energy costs.

Achieved one month ROI for property owner.

After occupancy surged to near 100% this Class A building energy costs increased making the property potentially less competitive. Challenged to not only reduce, but make gains in efficiency the management turned to an innovative new approach using CO2 sensors and were rewarded with a reduction of \$150,000 (\$.30 /sq. ft.) in the first eight months alone. The project investment was returned to the owner in less than one month and tenant comfort was improved on above design days.

Engineered Solutions:

- * CO2 Demand Controlled Ventilation strategy implemented for all Air-Handling units on 25 floors.
- * DDC control system re-designed providing for optimal control throughout range and reducing minimum design of outside air.
- * Reduced total Outside Air flow provides incremental freeze protection for all AHU's during low temperature extremes.
- * Reduced Outside Air intake also reduces Exhaust Air flow and provides for incremental energy conservation measures for adding Variable Frequency Drives to Air-Handling units and primary & secondary chilled water pumps.
- * Project recognized by EPRI (Electric Power Research Institute) for innovative technology approach in Commercial Office Building applications.

Client Objective 1: Reduce Steam Usage and Costs.

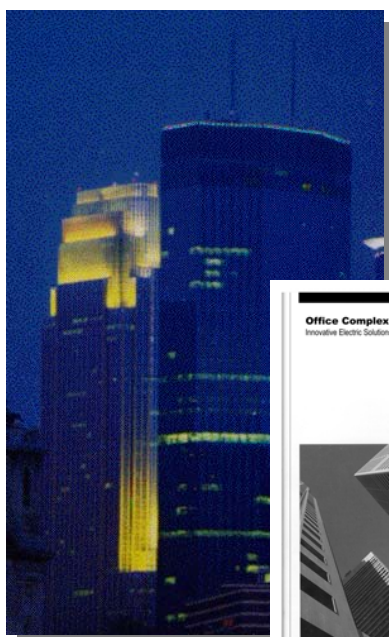
Client Result:
Steam load reduced by 5,809 MLbs, **(\$69,710)** in eight month period.

Client Objective 2: Reduce annual energy costs.

Client Result:
Annual energy costs reduced by \$150,503: Chilled Water Ton-Hours reduced by 181,900 **(\$51,136)**, Electric KWH reduced by 549,200 **(\$29,657)**, a savings of \$.30 sq./ft. Facility now ranks among the lowest in the local market after project completion.

Client Objective 3: Do Not Compromise Tenant Satisfaction.

Client Result:
Client comfort remains at an



all-time high. During hot & humid days comfort is actually improved.

Client Objective 4: Improve Ability to Out Compete Similar Properties.

Client Result:
Lowered annual operating costs and improved comfort factors have been established setting a new standard of service and efficiency.

CO2 DCV Applications:

- Office Buildings
- Conference Centers
- Hotel Banquet Rooms
- Convention Centers
- Theaters
- Stage & Auditoriums
- Airports
- Restaurants