



## Ground Source Fact Sheet for Architects

- **Increased Design Flexibility.** Ground Source systems provide the architect with optimal design flexibility because the roof and landscape are free of chillers, air handlers and other outdoor equipment. Ground Source can benefit a building's design because there is no need for unsightly and noisy rooftop equipment, such as split systems and cooling towers. Without the necessity of rooftop equipment, the architect is free to experiment with alternative roof styles. Eliminating rooftop equipment also reduces the load-bearing requirements of the roof structure. The air distribution ducts can be reduced, allowing for higher ceilings or reduced construction costs.
- **Increased Floor Space.** With Ground Source systems, boiler rooms can be eliminated and the size of mechanical rooms can be significantly reduced. Less mechanical space (1-3 % of GFA) means more productive space and more design freedom.
- **Increased reliability and reduced maintenance.** The elimination of outdoor or rooftop equipment means the Ground Source system is not exposed to temperature extremes, dirt, pollution or vandalism. For this reason, Ground Source systems require less maintenance than conventional systems. Furthermore, Ground Source systems retain their high efficiency over the years. Since units are protected from weather, equipment life is extended and cost of repairs due to vandalism is eliminated.
- **Increased Efficiency Means Cost Savings.** Ground Source systems typically operate with a Coefficient of Performance (COP) of 4 to 5 under all conditions, including temperature extremes. For example, a Ground Source system typically saves 25 to 50 percent on heating and cooling bills, compared to other technologies.

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**High Efficiency Ground Source Heating and Cooling Systems**

- **Reduced CO<sub>2</sub> Emissions.** For every 2.5 hours of use, a Ground Source system produces one kilogram less CO<sub>2</sub> than a conventional HVAC system. For example, where the electrical source is a coal-fired power station, a 500 kW conventional system discharges 550 tonnes of CO<sub>2</sub> p.a compared to 160 tonnes of CO<sub>2</sub> p.a for a Ground Source system.
- **Quiet Operation.** Ground Source systems have few moving parts and typically provide much quieter operation than conventional systems.
- **Increased Safety and Public Health.** Ground Source systems do not require a flue or chimney. Since there is no on-site combustion, there is less chance of fire, and no chance at all of carbon monoxide spilling back into the building. The absence of cooling towers also eliminates the potential threat of Legionnaire's disease.
- **Historical Buildings.** Because Ground Source systems are so flexible, they are ideal for renovating buildings with historical merit. One successful strategy is to use smaller heat pumps dispersed in closets, basements, and attics to provide space conditioning and ventilation with minimal ducting. Additionally, because the ground loop heat exchanger is completely invisible, there are no unsightly condensers on the roof or grounds to distract from the building's historic charm.
- **Marketing Point of Difference.** Knowledge of and experience with Ground Source systems can be an effective marketing tool for the architectural firm.