

Customer Connection for **BUSINESS**



Energy information to help you manage your operation

May 2022

Air-to-water heat pumps

Efficient heating, cooling, and water heating

An air-to-water heat pump (AWHP) is an excellent option for those who want the efficiency of a geothermal heat pump but don't have the required land or capital that a geothermal system requires.

It's a highly efficient option as a boiler replacement for a radiator or in-floor hydronic heating system. And an AWHP can transfer heat to supply a forced-air heating and cooling system. It also meets domestic hot water needs when installed with a buffer tank.

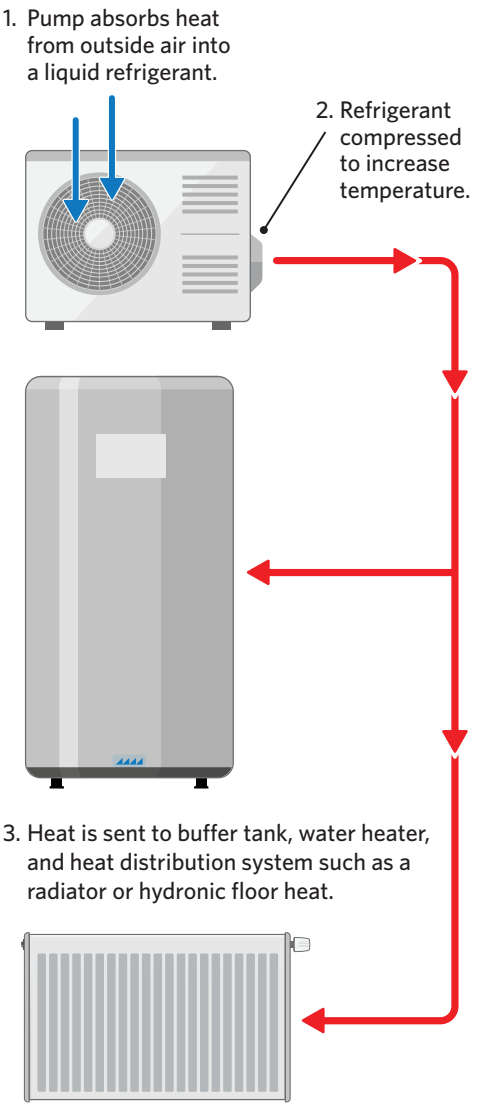
How it works

An AWHP is similar to an air-to-air heat pump because it extracts heat from outdoor air for heating cycles and rejects heat into outdoor air during cooling operations. It's different from an air-to-air heat pump because it uses water to transfer heat into or out of inside spaces.

Effective for cold climates

Some AWHPs can heat water to more than 130°F even when outdoor temps are frigid. However, systems are typically operated in the 110°F - 120°F range to optimize efficiency. Some models achieve nearly 400 percent efficiency (COP of 4.0) at freezing and greater than 150 percent efficiency at outdoor temps of -10°F, making them an excellent fit for efficient heating in our challenging northern climate. That efficiency level results in 40 percent to 60 percent energy savings compared to a fossil-fuel system.

We offer a \$400 per ton rebate on qualified installations. Check out rebate requirements when you're planning your heating system upgrade.



Buffer tanks

A buffer tank stores hot water from an air-to-water (or geothermal) heat pump. It supplies heat to meet the instant demands of in-floor or ducted heating systems, and that helps reduce heat pump cycling. Because heat pump technology is least efficient during initial system startup, a buffer tank increases overall system efficiency.

There are a few different options when it comes to buffer tanks. Some include electric resistance heating coils that provide backup or supplemental heating, some pre-heat water delivered to a standard water heater for final heating, and some directly supply hot water for domestic use.

Minnesota customers that install a buffer tank with a heat pump system may qualify for a \$200 per ton rebate. Visit otpc.com/MNRebates to learn more.



Buffer tank with copper heating coils
Source: Arctic Heat Pumps

Meet Drew Martig

Energy Management Representative serving the Morris, Minnesota, area



Drew joined our team of Energy Experts in February. He brings extensive experience as an electrician working on construction projects from 2005 to 2014, and since that time, as part of the maintenance and instrumentation and control teams at our Big Stone Plant.

While working as a construction electrician, Drew gained experience with load management, off-peak technologies, and HVAC systems, including heat pumps, plenum heaters, electric boilers, water heaters, and thermal storage heaters. He's also worked on several commercial lighting retrofits upgrading to new energy-efficient technologies.

Drew is excited about his new role and enjoys working with customers to help them save money!

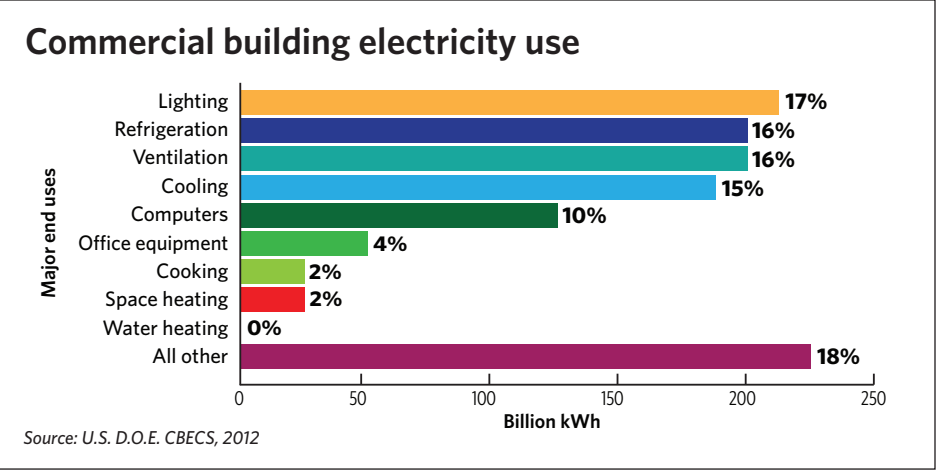
Call Drew at 800-346-4920 Ext. 6203. Or find the rest of our team on back.

Energy use in commercial buildings

According to the 2018 Department of Energy (D.O.E.) Commercial Buildings Energy Consumption Survey (CBECS), since 2000 the trend in building construction has been for larger-sized buildings. On average, square footage today is 5,000 square feet larger than buildings constructed before 1960.

Larger-sized commercial buildings had a greater share of total commercial building energy consumption too. For example, while less than one percent of buildings were more than 200,000 square feet (the size of a large school building), they accounted for about 26 percent of total commercial building energy consumption. Mid-range buildings of 25,000 square feet to 200,000 square feet, which accounted for just 11 percent of building stock, consumed about 42 percent of total commercial building energy. **As building sizes grow, finding energy cost savings becomes critical to business profits.**

The place to look for energy cost savings is with the biggest energy users. And one of those the survey revealed is lighting. In fact, lighting consumed more electricity than any other single end use.



LED lighting use trends higher in commercial buildings

An update to the CBECS reported that LED lamp use in commercial buildings rose from 9 percent in 2012 to 44 percent by 2018. Standard fluorescent lighting is still the most common type of lighting in commercial buildings, but has declined by 16 percent since 2012.

LED lighting offers many benefits. It uses up to 90 percent less energy and lasts up to 25 times longer than incandescent bulbs. It also offers excellent control and dimming capabilities, outstanding color rendering, and a range of color options. LEDs lower operating costs overall. Savings are realized in energy and demand expenses as well as maintenance costs. Less quantifiable benefits include improved lighting quality, higher worker productivity, and more opportunities for dimming and other control strategies to further lower energy costs.

LED lamp and installation costs have been declining in recent years making now a good time to upgrade the lighting in your building. In areas where rebates are available, our incentives can cover as much as half the cost of your project and accelerate simple payback on your investment to under three years.

Sort through lighting-related buzzwords by familiarizing yourself with the following lighting facts label information.

**Light output/
Lumens**
Measures light output. The higher the number, the more light is emitted.

Watts
Measures energy required to light the product. The lower the wattage, the less energy used.

Lumens per watt/Efficacy
Measures efficiency. The higher the number, the more efficient the product.

Lighting Facts™
LED Product

- **Light Output (Lumens)** 840
- **Watts** 9
- **Lumens per Watt (Efficacy)** 93

Color Accuracy 87
Color Rendering Index (CRI)

Light Color
Correlated Color Temperature (CCT) 3100 (Warm White)

2600K 3200K 4500K 6500K

Visit www.lighting-facts.com for the **Label Reference Guide**.
All results are according to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

Color Rendering Index (CRI)
Measures color accuracy. Color rendition is the effect of the lamp's light spectrum on the color appearance of objects.

Correlated Color Temperature (CCT)
Measures light color. "Cool" colors have higher Kelvin temperatures (3600-5500 K); "warmer" colors have lower Kelvin temperatures (2700-3500 K).

Save on lighting



Exit signs: Switch to ENERGY STAR® LED models. LED options use about one-tenth the wattage and last 50 times longer than incandescent-lamp signs.



Occupancy sensors: Install occupancy sensors that automatically turn lights on or off depending on occupancy in conference rooms, break rooms, individual offices, or other intermittently-used areas.



Daylighting controls: Consider installing daylighting controls to turn off or dim electric lighting when adequate sunlight is available.



Photocells: Install automatic controls to turn exterior lighting on or off as daylight levels change.

Our team of energy experts



Roger Garton
Bemidji, MN area



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Jamestown and Oakes, ND areas



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If you have a project to discuss, call one of our representatives at **800-493-3299**.



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