

Very High Efficiency HVAC (VHE HVAC)

VHE HVAC is a new, systems approach to commercial HVAC that delivers large benefits:

- Heating and cooling energy use is reduced by 50% or more
- Ventilation and indoor air quality are noticeably improved
- Fossil fuel use for space heating is eliminated, allowing companies to meet internal environmental targets as well as government mandates for building performance.

With most HVAC systems, increasing ventilation means increasing energy costs. VHE HVAC provides 100%, highly-filtered outside air while also dramatically reducing energy bills.

How Does It Work?

VHE HVAC is a performance-based, technical specification that optimizes the entire HVAC system. Individual components include high-efficiency heating and cooling equipment, extremely high performance heat or energy recovery, a dedicated outdoor air system, advanced filtration, and airflow segregation that limits the spread of contaminants. Critical design specifications ensure that these components work together to deliver maximum performance. Developed by the Northwest Energy Efficiency Alliance (NEEA), VHE HVAC was tested between 2015 and 2018 in eight, [rigorously-documented](#) demonstration sites in the Pacific Northwest. The resulting HVAC savings ranged from 48%–89% and participants gave unsolicited testimonials about the improved indoor air quality.

NEEA Demonstration Results

Building Type	HVAC Energy Savings
Airport terminal office	89%
Government district office	73%
Government dorms	77%
Law office	75%
Pizza restaurant	51%
Restaurant	77%
Seattle office	69%
Utility district office	48%

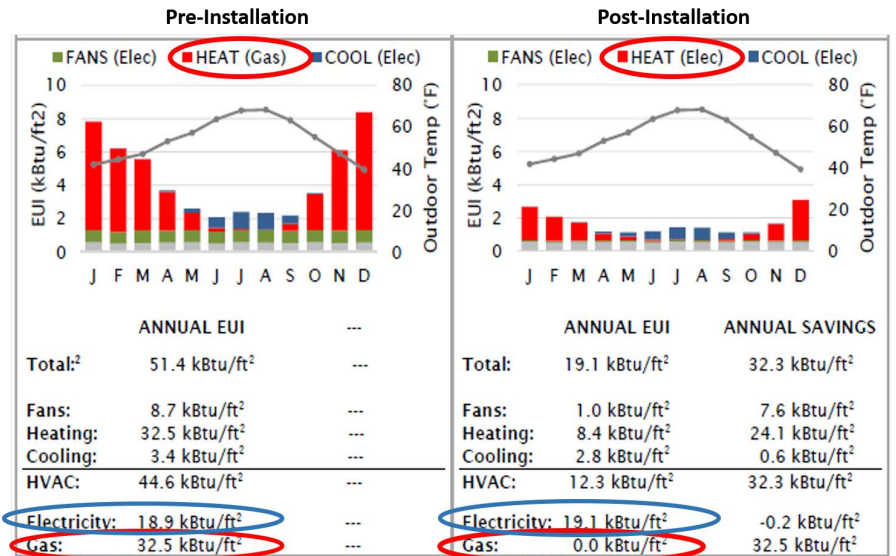
Electrification

“There was definitely a noticeable difference—this was a much more comfortable environment. Other people in areas that hadn’t yet been converted kept asking ‘When are we getting our air fixed?’”

Ryan McCormick
Chief Engineer
Oregon Department of
Fish & Wildlife

This chart shows a demonstration building that was converted from gas heat to electric heat with virtually no increase in electricity use. Peak demand simultaneously decreased by almost 30%.

Law Office Results, Portland, OR



What Buildings Does it Apply to?

VHE HVAC is a total system replacement. Commercial buildings six stories or less with heating and cooling provided by packaged rooftop or small unitary systems/boilers that are at the end of their service life and planning to be replaced make ideal candidates. Buildings higher than six stories with floors that have self-contained HVAC systems also have applications. Multifamily residential buildings are appropriate if they have construction suitable for installing ductwork to distribute ventilation air through chases and plenums. Excellent applications are office, retail, lodging, and education buildings.

Available Assistance

IMT will provide technical assistance to your engineering staff or contractors to design a VHE HVAC system that minimizes overall system cost, size, and refrigerant volume consistent with providing for the safety and comfort of occupants and accepted engineering practices. In addition, many utilities provide incentives for high-efficiency heating and cooling equipment that apply to VHE HVAC.

For More Information

Contact vhehvac@imt.org or go to www.imt.org/very-high-efficiency-hvac to learn more.