

SAVE ON HIGH-PERFORMANCE HVAC SYSTEMS WITH POWERSHIFT BY NV ENERGY

Commercial buildings spend approximately 40% of their electricity usage operating HVAC (heating, ventilating and air-conditioning) systems. With such a large portion of energy consumption going toward one system, it makes sense to incorporate energy efficiency strategies to maximize usage. In fact, the Whole Building Design Guide (WBDG), a program of the National Institute of Building Sciences, estimates that high-performance HVAC equipment can result in energy and cost savings ranging from 10%-40%.



Things to Consider

Ensuring that your HVAC system is properly sized for your needs is essential. WBDG finds that systems are sized to meet worst-case cooling and heating conditions that historically only occur about 2%

of the time, which leads to oversized equipment. In fact, most systems are oversized by at least 10%. Oversized equipment increases operating costs and wear, and runs less efficiently than properly sized options. Correct this issue by installing a right-sized unit.



The DOE estimates that U.S. businesses could save about \$1 billion annually in energy costs by replacing existing units with high-performance RTUs

Because you can never save too much.



It is estimated that most systems operate at 50% or less of their capacity and are oversized by at least 10%

Also keep in mind that both over- and right-sized systems often operate under part-load conditions. It is estimated that most systems operate at 50% or less of their full-load capacity, so be sure to take part-load efficiencies into account when select a system. Rather than installing an oversized system to meet potential need, select right-sized equipment that meets current requirements and operates efficiently at part-load. Future needs can be met by making sure the distribution system and building can accommodate additional equipment at a later date.

Another consideration: Rooftop units (RTUs) account for a majority of the commercial HVAC systems in the U.S. In 2011, the DOE and Better Buildings Alliance released high-performance RTU design specifications expected to reduce energy use by as much as 50% compared to current ASHRAE 90.1 standards, depending on location and facility type.



Taking Control

Installing new equipment and controls are ideal ways to optimize energy usage by ensuring systems operate efficiently under typical, part-load conditions. For example:

- Install variable speed fan systems and variable speed drive controls on fan motors.
- Consider variable capacity cooling towers, pump systems and cooling plants as well as multiple-compressor chillers.
- Use a variable speed drive chiller to match motor output to chiller load.
- Install water temperature reset controls to raise the water temperature as demand decreases, making the chiller more efficient.
- Utilize energy management systems to analyze usage and maximize efficiency.



Large handling units benefit from variable speed drives



Terminology

Energy Efficiency Ratio (EER): Measure of energy efficiency in cooling mode at full-load; the higher the number, the more efficient the system. Look for units with an EER ratio above 12.0.

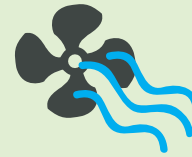
Integrated Energy Efficiency Ratio (IEER):

Measure of cooling part-load EER efficiency over a season for commercial unitary air conditioning or heat pump systems using four load points; the higher the number, the more efficient the system. Replaced integrated partial load value (IPLV).

Seasonal Energy Efficiency Ratio (SEER):

Measure of small equipment efficiency over the cooling season; the higher the number, the more efficient the system. Look for units with a SEER ratio between 14 and 17.

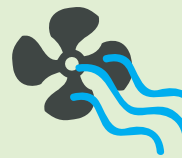
Coefficient of Performance (COP): A heat pump's ratio of heating or cooling provided to electrical energy consumed; the higher the number, the more efficient the system.



Cooling output
(Btu/hr)



Electrical input
(W)



Cooling output
(Btu) over a
season



Total electricity
(Wh) used over
the season



Heat output
(Btu/hr)



Electrical input
(Btu/hr)



Flexible Program Makes Efficiency Easier

To save energy and lower utility bills, NV Energy offers technical assistance and cash incentives on select energy-efficient equipment. Customers can select a project from a prescriptive list of measures or propose a custom project with verifiable energy savings.

- Incentives are available for new construction, major renovation and existing facility retrofit project improvements.
- Prescriptive HVAC measures include high-efficiency AC units, variable frequency drives for HVAC fan and pump motors, economizers, demand control ventilation, programmable thermostats, guest room energy management systems (EMS) and high-performance window film.
- Custom HVAC measures include EMS upgrades, high-efficiency chiller retrofits, water-side economizer systems and central plant optimization projects. Incentives for

custom measures are based on the annual kWh savings for the measure.

- Contact commercial energy services to help identify energy efficiency opportunities, determine required documentation for custom measures or for answers to other questions regarding incentive eligibility.

All commercial customers located in NV Energy's service territory are eligible. Incentives are available on a first-come, first-served basis.

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Because you can never save too much.