

# 3

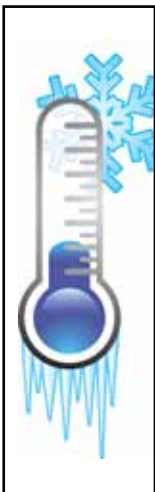
# HEATING, VENTILATION & AIR CONDITIONING FACT SHEET



## HEATING, VENTILATION AND AIR CONDITIONING (OR HVAC) IS AN ESSENTIAL AND LARGE ENERGY CONSUMER IN NEARLY ALL BUSINESSES

**HVAC systems provide essential services in generating** the proper air flow, heating and cooling to each room in a business. HVAC is an energy intensive process that is often the largest component of a commercial property energy bill particularly in Canberra where extensive heating is needed. Large savings can be made through investing in energy

efficient HVAC systems when upgrading while many effective strategies exist to optimise energy use in established systems and buildings. Whatever the size of the business, smart purchasing of equipment, regular maintenance and improved usage patterns will deliver energy savings, reduced operating costs and environmental benefits.



### REDUCE DEMAND

There are many different methods to reduce the demand for HVAC, which should be the first step in identifying energy efficiency opportunities. Potential measures can be divided into two categories - thermal performance and behavioural change. Thermal performance is all about limiting heat loss and heat gain in the building envelope while behavioural change focuses on changing patterns around the use of HVAC systems. The best solutions look at these two areas holistically to deliver the most cost effective energy efficiency improvements.



### STAFF EDUCATION

Staff education should be considered a priority to achieve maximum efficiency in the work place. If systems are not automated, engage staff and recommend optimum temperature levels, provide easily accessible controls and show how to operate units properly. Staff should also be encouraged to turn units off or down when not needed. Work with staff to develop solutions that reduce costs and still maintain their comfort levels. Consider using friendly reminders near unit controls to help ensure that recommendations deliver long lasting behavioural change and savings.



### MAINTENANCE

Regular maintenance is an important part of an ongoing energy efficiency strategy that is often not prioritised. Maintenance not only ensures the safety and comfort of staff and clients, it makes sure that businesses continue to function reliably and effectively now and in the future. Checking that the HVAC system is working properly also reduces the chances of equipment failure and increased operating and repair costs. Ensure that HVAC equipment is kept clean and free of dust and encourage staff to promptly report any problems with the system.



### ZONING

Zoning is the combining of rooms in a structure according to similar heating and cooling patterns, which in turn gives greater flexibility in which parts of a building are heated or cooled. Not only does zoning help to reduce running costs it also gives greater control to temperature settings in specific rooms creating a more comfortable environment. Zoning systems operate on a programmable thermostat that can be retrofitted to most existing systems or incorporated into the purchase of a new HVAC system.



**Universal Express are a** courier company located in Mitchell. They contacted ACTSmart early 2013 to have an energy assessment carried out in an effort to reduce running costs and improve sustainability. After having their assessment Universal Express were delivered a tailored report and action plan from the ACTSmart team that identified a number of energy and water saving opportunities available to them and calculated potential financial savings achievable should recommendations be

implemented. Universal Express's main offices were fitted with a number of old 'window rattler' air con units that were 15+ years old. In their report one of the 'actions' identified that would improve the businesses energy efficiency was replacement of current air con units with high efficiency reverse cycle units. It was estimated that replacing the old units (estimated 1 star) with modern 4 star units would save more than 50% of heating/cooling operating costs resulting in an annual saving of approximately \$1700. The company followed the recommendation, installed new units and was able to claim a \$5000 rebate to assist with the cost.

# 3

# HEATING, VENTILATION & AIR CONDITIONING FACT SHEET



## HVAC CONTROLS

**Effective controls on a HVAC system** allows greater flexibility and improved energy efficiency while providing the

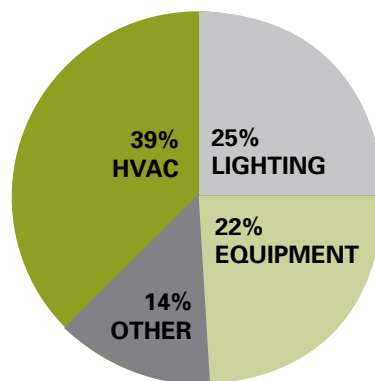
ideal building conditions. Good HVAC controls coupled with staff education is an excellent way to reduce energy use.

**OCCUPANCY** – Ensure controls are correctly set so that the HVAC is operational only where and when needed.

**TEMPERATURE** – Small, appropriate changes in temperature settings can translate to large savings over time. One degree cooler in winter and warmer in summer is a simple measure to save money.

**CONDITIONS** – If it is cooler outside staff and clients will wear warmer clothing so small decreases in HVAC temperature can be used.

## TYPICAL OFFICE ENERGY USE



## INSTALLING A NEW SYSTEM

**Installing or expanding a HVAC system** is a great opportunity to reduce future running and maintenance costs by

exploring energy efficient options. Here are different solutions that can greatly reduce ongoing operational costs.

**EVAPORATIVE COOLERS** – A device that draws outside air through a wet pad increasing humidity. These have cheaper up running costs and are generally easy to maintain. These systems are only suitable for dry climates such as the ACT and require constant air-flow through the premises.

**HEAT PUMPS** – A type of air conditioner in which the refrigeration cycle can be reversed, producing heating instead of cooling in the indoor environment in a cost effective manner.

**INVERTER** – A component in an air conditioner that controls the speed of the compressor motor delivering greater efficiency and reduced operating costs.

**PORTABLE UNITS** – A portable air conditioner is one on wheels that can be easily transported inside a home or office.

**HYDRONIC** – The use of water as the heat-transfer medium in heating and cooling systems and can be a cost effective solution in the right situation.

## GLOSSARY

**AIR CHANGES PER HOUR**  
The number of times per hour that the volume of a specific room or building is supplied or removed from that space.

**BUILDING ENVELOPE**  
Elements of the building, including all external building materials, windows, and walls, that enclose the internal space.

**COOLING CAPACITY**  
The quantity of heat that a cooling appliance is capable of removing from a room in one hour.

**ECONOMISER**  
An HVAC component that uses outside air, under suitable climate conditions, to reduce required mechanical cooling.

**INVERTER**  
A component in an air conditioner that controls the speed of the compressor motor delivering great efficiency and reduced operating costs.

**NATURAL VENTILATION**  
The movement of outdoor air into a space through intentionally provided openings, such as windows and doors, or through non-powered ventilators.

**TEMPERATURE ZONES**  
In HVAC individual rooms or zones in a building where temperature is controlled separately from other rooms or zones.

## CHECKLIST

**DETERMINE HOW WELL YOUR CURRENT SYSTEM IS PERFORMING** What are the reasons for upgrading and what are you wanting to achieve? Get staff involved.

**AUDIT CURRENT REFRIGERATION** Determine age, capacity and efficiency of current system. Determine usage patterns. Identify what components need to be upgraded.

**DETERMINE UPGRADE OPTIONS** Rank them based on payback periods. Prepare a business case for upgrading. Speak to a professional for the best advice.

**GET QUOTES FOR UPGRADES** Check installer

credentials, legal compliance and product warranty. All units should meet current mandatory energy performance standards (MEPS) and applicable legislative requirements (Electrical safety act 1971, Electrical Safety Regulations 1971. [www.actpla.act.gov.au](http://www.actpla.act.gov.au)). Check old items are being disposed of properly. Check product warranties.

**COMPLETE AND CHECK THE OF QUALITY WORK** implement any behavioural change strategies.

**ASSESS EFFECTIVENESS OF UPGRADES** Check your energy bills pre and post retrofit.